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Boundary-Work and the Vulnerability of
Academic Status

The Case of Finnish Nursing Science



ACADEMIC DISSERTATION

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Abstract

This study focuses on how the boundaries of nursing science have been defined and how its academic status has been challenged and defended in the course of two conflicts at the University of Tampere. The first conflict occurred as a PhD thesis on fasting was publicly defended in nursing science in 1996. The evening news on Finland's main television channel stated that the thesis was groundbreaking, and that fasting had been scientifically proven to be healthy, but the thesis's opponents criticised the thesis and the practices applied in the research. The Finnish Association of Sceptics also publicly criticised the thesis. That same year in the same department of nursing science, a Masters thesis concerning the concept and practice of 'therapeutic touch' aroused another conflict. The thesis was published as a book, the publisher of which received the Finnish Association of Sceptics' annual Humbug Award. This was a crisis for the nursing science community in Tampere, and after the award, the departmental committee for nursing science decided to ban certain books and theories. In particular, references to the works of the then popular nursing theorist Rosemarie Rizzo Parse were no longer to be accepted.

This study scrutinises boundary-work in the context of these two conflicts in Finnish nursing science. The concept of boundary-work, adopted from Thomas Gieryn, refers to the ways in which science is separated from other spheres of life. The methodology of the study comes from the rhetoric of science, which provides ways to analyse in detail the forms of argumentation which may be deployed during a conflict through various rhetorical tools to persuade and reassure the parties involved: the various disciplines within the academic community, the actors of nursing science, students, nurse practitioners or the scepticism movement. The study asks two research questions: what forms does scientific boundary-work take in the case of nursing science? How is nursing science defined by this boundary-work?

The study finds four forms of boundary-work. Intradisciplinary boundary-work defines a discipline's boundaries, norms and principles, and does disciplinary identity work. It distinguishes between insiders and outsiders, and identifies right and wrong, accepted and unaccepted knowledge forms and schools of thought within the discipline. Interdisciplinary boundary-work situates the discipline among other disciplines and views it in relation to them. It characterises disciplinarity versus multi-, trans- and interdisciplinarity. Boundary-work between science and society defines the social role, status and relevance of the discipline. It debates the social, political, cultural and economic benefits and harms of the discipline, and

analyses its relationship with societal actors and social movements. Boundary-work between science and other knowledge systems concerns the relationship of science with non-science, religion, magic, irrationality, New Age and other systems of knowledge considered unscientific. In the documentary material, newspaper articles and scientific discussions analysed for the study, the different forms of boundary-work interrelate and overlap so that the same argument or text can be used in two or more forms of boundary-work.

This study highlights the diversity of ways in which nursing science is characterised in the two conflicts. In this context the academic status of the then small and emerging female-dominated field with professional bonds seems vulnerable. This is shown multi-dimensionally in the forms of boundary-work. In intradisciplinary boundary-work in the conflicts over fasting and therapeutic touch the vulnerability of nursing science's academic status was evident in that the discipline needed to be legitimated as unambiguously strong, precise and scientific. In the interdisciplinary boundary-work nursing science appeared as 'a little sister' in need of protection and guidance, an unstable newcomer short of acceptance from other disciplines, and consequently, a discipline that was subordinate especially to medicine. In the boundary-work between science and society, nursing science was presented as having a wide and significant societal impact in order to justify its position. Underlining the societal impact allowed nursing science to be protected against the fear that the discipline might be rendered invisible. In the boundary-work between science and other knowledge systems nursing science was presented as unscientific, and was depicted as a route by which unscientific knowledge might enter science. Since these charges were made in public, in the context of the conflicts over fasting and therapeutic touch, this argumentation forced nursing science on the defensive side and made it appear vulnerable.

The main contribution of this study is to elaborate the boundary-work concept of Gieryn and to identify and examine different forms of boundary-work simultaneously, even within a single conflict. The four-part framework is a contribution to boundary-work studies because it proposes a new way to address multiple boundaries and the simultaneity of boundary-crossings for which the two conflicts in Finnish nursing science provided especially fruitful research material. The study contributes to the sociology of science by addressing a discipline that has previously been neglected and produces new knowledge about its status in the academic world and in the broad socio-cultural context.

Tiivistelmä

Tutkimuksessa tarkastellaan, miten hoitotieteen rajat määritellään ja miten hoitotiedettä ja sen akateemista asemaa kuvataan kahdessa Tampereen yliopiston kiistassa, joiden yhteydessä hoitotiedettä tieteenalana luonnehdittiin harvinaisen monipuolisesti. Ensimmäisessä kiistassa hoitotieteen väitöskirja paastosta tarkastettiin Tampereen yliopistolla alkuvuonna 1996. Väitöspäivänä television pääuutislähetyksessä todettiin, että väitöskirja on läpimurto ja että paasto on tieteellisesti todistettu terveelliseksi. Vastaväittäjät kuitenkin arvioivat väitöskirjaa ja sen käytännön toteuttamista kriittisesti. Myös Skepsis-yhdistys kritisoi väitöskirjaa julkisesti. Samana vuonna pro gradu –tutkielma terapeutin kosketuksen käsitteestä ja käytännöistä sai aikaan toisen kohun. Gradu julkaistiin kirjana, ja kirjan julkaisija sai sen johdosta Skepsis-yhdistyksen Huhua-palkinnon. Tämä aiheutti kriisin Tampereen yliopiston hoitotieteen laitoksella, ja palkinnon myöntämisen jälkeen hoitotieteen laitosneuvosto päättikin kieltää tiettyjen teosten ja teorioiden käyttämisen hoitotieteen opinnäytteissä. Erityisesti kiellettiin viittaukset hoitotieteen teoreetikko Rosemarie Rizzo Parsen teoksiin.

Tämä tutkimus analysoi suomalaisen hoitotieteen rajatyötä näiden kiistojen kontekstissa. Thomas Gierynin kehittämä rajatyön käsite tarkoittaa tapoja, joilla tiede erotetaan muista elämänalueista. Tässä tutkimuksessa muodostetaan uudenlainen viitekehys tieteen rajatyön tutkimukseen. Tutkimus analysoi retorisen tieteentutkimuksen keinoin, millaisilla retorisilla keinoilla kohuissa pyrittiin vakuuttamaan eri osapuolia: tiedeyhteisön eri tieteenalojen edustajia, hoitotieteen keskeisiä toimijoita opiskelijat mukaan lukien, käytännön hoitotyön tekijöitä ja skeptikkoliikettä. Työn tavoitteena on selvittää, millaisia muotoja rajatyö saa hoitotieteen konfliktitilanteissa ja millaisia piirteitä hoitotieteeseen liitetään rajatyön aikana.

Tutkimuksessa löydettiin neljänlaista rajatyötä. Tieteensisäisessä rajatyössä määritellään tieteenalan rajoja, normeja ja periaatteita sekä tehdään tieteenalan identiteettityötä. Siinä myös erotellaan tieteenalan sisäisiä ja ulkoisia tahoja sekä eri tietomuotoja ja koulukuntia. Tieteidenvälinen rajatyö puolestaan sijoittaa tieteenalan muiden tieteenalojen joukkoon ja kuvaa tieteenalaa suhteessa muihin tieteenaloihin. Siinä luonnehditaan tieteenalakohtaisuutta ja verrataan alaa monitieteisiin, poikkitieteisiin tai tieteidenvälisiin lähestymistapoihin. Tieteen ja yhteiskunnan välisessä rajatyössä pohditaan tieteen yhteiskunnallista roolia, asemaa ja merkitystä. Siinä tuodaan esiin tieteenalan yhteiskunnallisia, poliittisia, kulttuurisia ja taloudellisia hyötyjä ja haittoja sekä alan suhteita yhteiskunnallisiin toimijoihin ja liikkeisiin. Tieteen ja muiden tietojärjestelmien välinen rajatyö käsittelee tieteen suhdetta

epätieteeseen, uskontoon, magiaan, irrationaalisuuteen, new age –liik-
keeseen sekä muihin epätieteellisenä pidettyihin tietojärjestelmiin. Tut-
kituissa dokumenteissa, uutiseloissa, sanomalehtikirjoituksissa ja
keskusteluartikkeleissa nämä neljä rajatyön muotoa ovat yhteydessä
keskenään ja limittyvät siten, että samaa argumenttia tai tekstiä voidaan
käyttää kahdessa tai useammassa rajatyön muodossa.

Tutkimus nostaa esiin erilaisia tapoja, joilla hoitotiedettä luonneh-
dittiin kahdessa tutkitussa kiistassa. Näissä tilanteissa pienen ja tutki-
mustoiminnaltaan vielä kehkeytymässä olevan naisvaltaisen ja ammat-
tisuuntautuneen tieteenalan akateeminen asema vaikuttaa haavoit-
tuvalta. Tämä ilmenee monin tavoin eri rajatyön muodoissa. Tieteensi-
säisessä rajatyössä tämä näkyy siten, että hoitotieteen asema pyritään
oikeuttamaan esittämällä se kiistattoman vahvana, täsmällisenä ja tie-
teellisenä tieteenalana. Tieteidenvälisessä rajatyössä hoitotiedettä kuva-
taan muiden tieteenalojen ”pikkusiskona”, joka tarvitsee suojelua ja
ohjausta. Hoitotiede näyttäytyy uutena ja epävakana alana, joka on
riippuvainen toisten tieteenalojen hyväksynnästä ja alisteinen eritoten
lääketieteelle. Tieteen ja yhteiskunnan välisessä rajatyössä hoitotieteen
yhteiskunnallinen vaikuttavuus kuvataan laajana ja merkittävänä, jotta
ala saisi oikeutuksen. Yhteiskunnallisen vaikuttavuuden korostaminen
suoja hoitotiedettä siltä, että muut pitäisivät tieteenalaa näkymät-
tömänä ja merkityksettömänä. Tieteen ja muiden tietojärjestelmien
välisessä rajatyössä hoitotiede kuvataan epätieteelliseksi väyläksi, jota
kautta epätiede pääsee tunkeutumaan tieteen alueelle. Paaston ja tera-
peuttisen kosketuksen kiistojen yhteydessä tiede ja epätiede sekoit-
tuivat, mikä pakotti hoitotieteen puolustuskannalle ja sai sen näyttäy-
tymään haavoittuvana.

Tutkimuksen pääasiallisena antina on kehittää Gierynin rajatyön
lähestymistapaa ja luoda viitekehys, jonka avulla kaikki tieteen rajatyön
muodot voidaan löytää samanaikaisesti jo yhdestä konfliktitilanteesta.
Neliosainen viitekehys edistää tieteen rajatyön tutkimusta, koska se
tuottaa uudenlaisen tavan lähestyä tieteen moninaisia rajoja ja rajan-
käyntejä. Tässä suomalaisen hoitotieteen kaksi kiistaa olivat erityisen
hedelmällistä tutkimusmateriaalia. Tutkimus käsittelee hoitotieteen
tieteenalaa, jonka tutkimus on tieteesosiologiassa laiminlyöty. Tutki-
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maailmassa ja sosiokulttuurisessa yhteydessä.

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I dedicate this study to Finnish nurses and nursing scholars.

Tampere, October 2013

The human being, also a poet, once in a while stops to ponder the world, space, his place in the universe, his existence: time, life and death, the meaning and meaninglessness of all. There is no evidence that animals do not ponder these matters, but then, there is no evidence that they do so either. Poetry, philosophy, science and religion presumably came into being together as one, when the human being looked into the depth of the night sky, and they became separate fields only when, in daylight, he started to distinguish himself from the animals, and to disregard his nightly dreams.

From Kai Nieminen, *Istun tässä, ihmettelen. Valitut runot [I Sit Here, Wondering: Selected Poems]* (2012; my translation)

1. Introduction

The year 1996 was exceptional in nursing science at the University of Tampere, Finland. Near the spring equinox, just as the snow was melting and the pussy willows were about to blossom, the efficacy of fasting became an issue. A PhD thesis on fasting was publicly defended on 22 March. The hall where the public defence was being held was packed, and more room was made available with the help of a video link in another lecture hall, so as to fit in all of the audience. The evening news on Finland's main television channel stated that the thesis was groundbreaking, and that fasting had been scientifically proven to be healthy. However, the thesis's opponents at the public defence criticised the thesis and the practices applied in the research. Soon afterwards, one of the opponents wrote to the *Finnish Medical Journal* to criticise the PhD thesis, and to express his astonishment at the publicity it had gained. The Finnish Association of Sceptics also publicly criticised the thesis.

That same year, during the dark northern winter as Christmas approached, a Masters thesis in the same department of nursing science became a cause for concern. This Masters thesis, which in fact had been completed a couple of years earlier, analysed the concept and practice of 'therapeutic touch'. The thesis was published as a book, by a publisher well known for its textbooks aimed at healthcare practitioners. The thesis had been completed and submitted in the normal manner, and had received a good grade. The trouble started on 12 December, when the Finnish Association of Sceptics announced its annual Humbug Award. The award was given to the book's publisher, and this was reported in the daily newspapers. This was a crisis for the nursing science community in Tampere, and after the award, the departmental committee for nursing science decided to ban certain books and theories. In particular, references to the works of the then popular nursing theorist Rosemarie Rizzo Parse were no longer to be accepted. Students who had included references to Parse in their theses were dumbfounded: what were they to do with these theses, which were almost ready for submission? A seminar was organised in

the department, at which academic staff explained the departmental committee's decision to astonished students.

My study scrutinises boundary-work in the context of these two conflicts in Finnish nursing science. When the conflicts took place, nursing science had been an academic discipline in Finland for 15 years. It had already established a position in several universities, with professorships, a flow of students, and some PhD theses. The conflicts occurred in the small nursing science unit at the University of Tampere, where there was one full professor, one associate professor, two lecturers and an assistant. Their tasks centred on teaching students on the programme of nursing science, although research activities were also developing rapidly, and the first four PhD theses had already been published. However, nursing science was still a small and emerging discipline, developing its academic status in the midst of other, more established disciplines – particularly the strong and established discipline of medicine, located in the same faculty. Nursing science was strongly rooted in the nursing profession, and focused on the generation of ideas to help develop nurses' practical work. It was also a female-dominated field. The conflicts over fasting and therapeutic touch exacerbated its fragile academic status.

Theoretically this study is grounded in the boundary-work approach. Scientific boundary-work refers to the separation of science from any other territory, sphere or domain. The premise of this study is that conflicts are situations in which many scientific boundaries are drawn simultaneously, and that an abundance of scientific boundary-work goes on continuously in such conflict situations, especially in small, emerging, profession-oriented and female-dominated disciplines. It follows from these premises that in any one conflict over science – for example, in the conflict over fasting, or that over therapeutic touch – boundary-work can take many forms. To this end, I have developed a framework for analysing the various forms of boundary-work involved in scientific conflicts. The framework contains four preliminary categories which are used to analyse scientific boundary-work in these two conflicts over nursing science.

The interpretation of these scientific conflicts requires a detailed and fine-grained method of analysis. A focus on the rhetoric of science provides ways to analyse in detail the forms of argumentation which during a conflict may be filled out with various rhetorical tools to persuade and reassure the parties involved: the various disciplines within the academic community, the actors of nursing science,

students of the field, nurse practitioners or the scepticism movement. The texts involved in the conflicts – for example, evaluation statements on PhD theses, or the minutes of departmental committee meetings – offer vantage points on rhetorical boundary-work over nursing science and its academic status. This study asks two research questions: what forms does scientific boundary-work take in the case of nursing science? How is nursing science defined by this boundary-work? By answering these questions, the study contributes to the theoretical development of boundary-work studies by combining several forms of boundary-work in a new type of framework. It addresses a discipline that has previously been neglected in boundary-work studies, and produces new knowledge about its status in the academic world and in the broad socio-cultural context.

This study starts with a theoretical chapter (chapter two), which introduces the concept of boundary-work and the boundary-work approach. It sifts through the traditions of demarcation, controversy and conflict in science. The chapter ends by presenting a framework for analysing nursing science boundary-work. Chapter three introduces the case of nursing science. It presents the method of rhetorical analysis, and rearticulates the research questions methodologically. It also contains a detailed description of the research and background material. Chapters four and five present the research results: the forms of boundary-work over nursing science in the conflicts over fasting and therapeutic touch. Each chapter is organised into four subchapters on intradisciplinary boundary-work, interdisciplinary boundary-work, boundary-work between science and society, and boundary-work between science and other knowledge systems, in line with the analytical framework. These subchapters end with a summarising subchapter that discusses the qualities and characteristics associated with nursing science in the different forms of boundary-work. Chapters four and five aim to produce a rich picture of the diversity of the rhetorical tools and contexts used in boundary-work during these conflicts. The concluding chapter summarises the study's analysis and makes suggestions for further research on boundary-work. It discusses the relevance of the results for both the boundary-work approach and the discipline of nursing science.

2. Theoretical framework

Boundary-work: concept and approach

The concept 'scientific boundary-work' was first introduced by the sociologist of science Thomas F. Gieryn. This concept, which I will mostly refer to with the shorter term 'boundary-work', is useful for this study for three reasons. First, boundary-work in Gieryn's (1995, 440) terms has to do with 'how [people] define 'science' by attributing characteristics that spatially segregate it from other territories in the culturescape'. This is a very broad and useful definition. Boundary-work thus refers to the separation of science from any other territory, sphere or domain. The term 'culturescape' in connection with boundary-work focuses attention on the cultural environment within which science is defined. This study is about nursing science in Finland, which is a deeply cultural affair, embedded in the professional and unprofessional, official and unofficial cultures of care of a Nordic welfare state. Moreover, nursing science is rooted in indigenous knowledge about caring, childbirth and methods of cure, and is in the process of making into science certain forms of knowledge that have hitherto been the province of other disciplines in the West. With Gieryn's broad notion of culture, the concept of boundary-work enables this process to be analysed.

Gieryn (1995, 406) describes boundary-work as 'rhetorical games of inclusion and exclusion', which are a step 'toward a cultural interpretation of historically changing allocations of power, authority, control, credibility, expertise, prestige, and material resources among groups and occupations'. As a newly established academic field, nursing science is in constant negotiation with these issues. Nursing science is also a female-dominated discipline – all of its professors, most of its researchers and most of its students are female – which makes it potentially a doubly marginal field of research. Gieryn's concept of boundary-work is useful for seeking out hidden and gendered power structures and hierarchies regarding nursing science and its relation to other fields in the university context.

Second, the concept of boundary-work allows the study of multiple actors and orientations in the definition of science. While Gieryn himself writes mostly about the perspectives of scientists in boundary-work, he also includes ‘scientists, would-be scientists, science critics, journalists, bureaucrats, lawyers, and other interested parties’ (Gieryn 1995, 394) among those who can actively pursue boundary-work. Moreover, he (1995, 394) writes of settings that are ‘often distant from laboratories and professional journals’. In the case of nursing science boundary-work, it is important to take into consideration the different views expressed by nurses and other officially registered and unregistered caring professionals, nurse administrators, nurse educators, nursing science students, representatives of different schools of nursing, different academic disciplines, and decision-makers and political parties concerned with the welfare state model. The group comprised of patients is often a silent group in the background, which nonetheless is subject to concerns and juxtapositions. The settings where nursing science gets defined are equally diverse. Thus Gieryn’s concept of boundary-work can capture and take into account the multiple actors and settings where nursing science is done and defined.

Third, while Gieryn himself analyses the separation of science from non-science, he does not limit the concept of boundary-work to this alone, but sees the broader utility of the concept in the ‘ideological demarcations of disciplines, specialties or theoretical orientations within science’ (Gieryn 1983, 792). It seems that the concept of boundary-work might be useful in situations where several boundaries of science are at stake. For the analysis of nursing science boundary-work, this is an important conceptual requirement, because its boundary-work is not limited to the demarcation of science from non-science. Moreover, these discussions are often overlapping, which means that ‘contradictory sets of characteristics’ (Mellor 2003, 521) of science emerge in conflicts.

Thus the concept of boundary-work is adopted as the main theoretical concept for this research. The empirical approach through which Gieryn studied boundary-work, however, concentrated on factors other than the *forms* of boundary-work. Gieryn (1983, 1995 and 1999) developed the approach in order to study actors and their interests, together with the arenas, in controversial episodes. Gieryn studied the players and stakeholders in such episodes. He identified three groups of actors or social roles (Gieryn 1999, 22): 1) contestants

who seek to attach epistemic authority to their claims about nature, 2) those who make practical decisions based on supposedly reliable knowledge, and 3) those who are affected by those attachments of epistemic authority. He (1999, 23–25) mapped out the goals and interests of strategic actors in controversies, and he analysed such controversies' institutional and organisational settings. He scrutinised the 'local and episodic contingencies of immediate occasions' in the controversies of science.

Gieryn applied this approach to several case studies: the separation of science from religion and engineering practice in Victorian England (Gieryn 1983 and 1999); boundary-work between phrenologists and anatomists at the beginning of 19th century in England (Gieryn 1983 and 1999); the exclusion of Soviet scientists from the scientific community of the United States (Gieryn 1983); the separation of natural sciences and social sciences in the US Congress in the 1940s and 1950s (Gieryn 1999); the case of cold fusion (Gieryn 1999); a change from hard-core scientific methods to traditional methods by two researchers in biology (Gieryn 1999); and the science wars (Gieryn 1999).

Gieryn's approach has been applied to many cases of controversy, and it has proved useful for studies that ask why boundary-work happens. It is a good conceptual basis for historical-sociological studies which clearly distil previous philosophical-historical-sociological studies. Gieryn concentrates on strategic actions in controversy situations, and thus produces a multitude of verbs to understand why boundary-work 'abounds' (Gieryn 1999, 12). A quotation from Gieryn (1999, 17) illustrates the point: 'As contestants for credibility pursue, deny, expand, constrict, protect, invade, usurp, enforce, or justify the epistemic authority of science (however bounded or landmarked), cultural maps get drawn and drawn again.' He (1999, 15–18) lists some of the reasons why boundary-work takes place in science. One is expulsion, where scientists legitimate their claims and aim to place dubious claims 'outside'. Another is expansion, where two or more authorities try to acquire power over some ontological area. A third is protection of autonomy, where scientists defend their power to make judgments about research topics when outsiders try to invade science's epistemic authority.

However, my study is interested in factors other than the actors, actions and reasons behind boundary-work. It focuses instead on the variety of boundary-work, how boundary-work is constructed and the

forms it takes. This study therefore develops a forms-of-boundary-work approach. In contrast to Gieryn's question about 'why boundary-work abounds', this study is interested in the abundance and variety of boundary-work. How, then, are the forms of boundary-work to be addressed? To build a framework for analysis, I have drawn on elements from different disciplinary traditions: the philosophy, history and sociology of science, anthropology, feminist studies, the sociology of professions, and various approaches in science and technology studies. The next section summarises these traditions in terms of how they help me to understand and build a research framework for analysing forms of boundary-work.

Research on demarcation, controversies and conflicts in science

Studies addressing demarcation, controversies and conflicts in science have been and remain very common in the philosophy, history and sociology of science. They provide insights into how to conceptualise and analyse forms of boundary-work. They help to develop the boundary-work approach proposed by Gieryn. This section considers such studies, starting with discussions in a variety of disciplines: the philosophy, history and sociology of science and the sociology of professions. It goes on to introduce perspectives from science and technology studies: strong-programme, interest theory, laboratory study, anthropological, feminist, disciplinary-culture, interdisciplinarity and social-worlds approaches.

The philosophy of science has directed substantial attention to the problem of demarcating science from non-science since the work of Vienna Circle philosophers at the beginning of the 20th century (Taylor 1996, 25–27). One of the most frequently mentioned philosophers of science is Karl Popper and his work *The Logic of Scientific Discovery*, originally published in 1934 (for example, Taylor 1996, 25–31, and Gieryn 1995, 395–398). Popper (1990, 34) sought criteria for demarcation, which he saw as fundamental for differentiating science from metaphysics. He claimed that 'the statements of empirical science must be capable of being finally decided, with respect to their truth and falsity' (1990, 40). The central idea, according to Popper (1990, 41), is to find explicit falsification

criteria for excluding unscientific claims and trends from science, according to the scientific method. This approach has been criticised, because no explicit criteria for falsification have ever been found, and it has been argued that the invalidation of theories is impossible (see the discussion in Harding 1976, xiv–xv, and Kiikeri and Ylikoski 2004, 89–90).

Because the demarcation problem remained unsolved, new perspectives were sought in order to solve it. These included work by Pierre Duhem in *The Aim and Structure of Physical Theory*, originally published in 1954, and by Willard van Orman Quine in several works published in the 1950s and 1960s. Duhem stated that scientists do not make their assumptions on the basis of a single hypothesis alone, but that instead they use a group of hypotheses, propositions and laws which form the system of science (Duhem 1981, 185). Taking physics in particular as a starting point, Duhem claimed that no single hypothesis can be isolated and tested as such, but that each hypothesis belongs to a larger group of hypotheses (Duhem 1981, 187). Thus the selection of hypotheses is grounded not solely in empirical evidence, but also in alternative hypotheses, or ‘auxiliary assumptions’. Quine saw science as a system, in which the ‘re-evaluation of some statements entails re-evaluation of others, because of their logical interconnections’ (Quine 1980, 42). He argued that any statement can be held true if sufficiently large adjustments are made elsewhere in the system (Quine 1980, 43).

In the philosophy of science these claims have been referred to as the Duhem-Quine thesis or the theory of the underdetermination of scientific theories. These discussions have led to the suggestion that social factors may also affect the theoretical development of science, which has opened up ways for the sociology of science to address the demarcation problem (Harding 1976, xxi, Knorr-Cetina and Mulkay 1983, 3–4). The reasoning involved in science appears to be not purely logical, but also affected by background assumptions, and by numerous other social factors (Knorr-Cetina and Mulkay 1983, 3–4).

Another angle on the demarcation problem has been offered by the physicist and historian of science Thomas S. Kuhn (see Brante and Elzinga 1990, Taylor 1996, 25–31, 43–45, Gieryn 1995, 395–398, 400–404, Baltas 2000, 44). His main work, *The Structure of Scientific Revolutions* (first published in 1962), drew attention to the controversies and dissent that occur at times when the paradigm of normal science is shifting. Normal science – by which he means cases where researchers

share a common theoretical-methodological framework and are committed to working towards a common goal – starts to encounter persistent problems, which Kuhn (1970, 52–53) calls anomalies, ‘the recognition that nature has somehow violated the paradigm-induced expectations that govern normal science’. These anomalies gradually become more and more generalised, creating more and more obstacles to continuation inside the paradigm of normal science. Kuhn claims that in such cases a phase of normal science has ended in crisis. At the time of crisis, the paradigm of normal science, its theories and techniques are challenged by new problems and theories (Kuhn 1970, 65). Kuhn (1970, 92) called the phases in which new problems and theories become dominant ‘scientific revolutions’, which lead to the substitution of the original paradigm with a new paradigm, with newly dominant theoretical underpinnings.

Kuhn’s work on scientific revolutions placed scientific controversies at the centre of attention. The idea that scientific controversies arise and develop during phases when the paradigm is shifting or becoming revolutionised has been widely used (Baltas 2000, 40). Demarcation studies after Kuhn have been inspired by the idea of anomalies, the persistent problems of normal science and its phases of crisis, which have provided conceptual tools for analysing the social aspects of the separation of science from other activities (Gieryn 1995, 404). Paradigmatic assumptions have been seen as ‘crucial weapons in scientific controversy’ (Taylor 1996, 44).

The philosophical-historical works of Popper, Duhem, Quine and Kuhn have been the basis for research that maps the basic argumentative structure of scientific controversies (Brante and Elzinga 1990, 40). These works have helped to establish scientific controversies as a topic of research. As such they also form the basis of this thesis, since the route taken here into the discipline of nursing science is through controversy. Indeed, the concept of boundary-work deals with the same issues as the problem of demarcation introduced in these works. Popper, Duhem, Quine and Kuhn have helped to acknowledge that the separation of science from other spheres of life is an essential part of actually doing science. However, they do not ask what different spheres are separated, or what elements the consequent boundary-work contains. Moreover, their theoretical analyses concentrate on the natural sciences, whereas this research is seeking to investigate a more applied and less established discipline, namely nursing science. This thesis aims to find out how different spheres are

defined as inside or outside of nursing science, and how this definition process is rhetorically conducted.

Research in the sociology of science has long considered scientific controversies and conflicts as fruitful research sites. The sociologist Robert K. Merton drew attention to the social nature of the scientific disagreements, conflicts and struggles over priority connected with science's system of reward (Merton 1957, 642–647). According to Merton (1957, 455), one reason for conflicts over priority is that science rewards originality and gives recognition on that basis. This gives rise to conflict, because scientists struggle for originality by honest and dishonest means (Merton 1957) and define insiders and outsiders (Merton 1973). Using social science research as a starting point, Merton (1973, 58) also considered the significance of scientific conflict in the development of science, and stressed that conflict is part of the scientific system. One source of conflict in science in Merton's view is the institutional norms of science – universalism, communism, disinterestedness and organised scepticism – which are often questioned when science tries to enter new fields, or when other fields try to control that of science (Merton 1972, 78).¹ Furthermore, he listed some of the historical conflicts in science that are now most frequently researched (see especially Merton 1957). He directed attention to scientific controversies and conflicts. Merton's ideas about scientific conflict have inspired analyses of the internal dynamics of scientific disputes, and have provided controversy studies with a strong sociological position alongside the traditional philosophy of science (Nowotny 1975, Prelli 1989, Brante and Elzinga 1990, Taylor 1991, Gieryn 1995, Taylor 1996, Potter 1996).²

The philosopher and social theorist Michel Foucault emphasised the entanglement of power and knowledge. Foucault stressed the embeddedness of knowledge in the microprocesses of power (Foucault 1980, 101). In his genealogical method, Foucault started from the present state of affairs and asked what conflicts and struggles had made this state possible (Helén 2005, 94). Importantly for studies addressing scientific controversies, Foucault drew attention to the

¹ The norms of Merton and the discussion about counter-norms are not introduced more broadly here. The norms in this study are related to disciplinary cultures, which are discussed later on in this section. Good reviews about the structural-functionalist norms and the discussion about them are found in Sismondo (2010, 23-35) and Käkikeri and Ylikoski (2004, 110-136). Following Sismondo (2010, 32), the norms are in this study seen as situationally and locally defined rhetorical resources

² Stehr (1990) discusses the general influence of Merton on the sociology of science.

forms of knowledge that come to the fore in conflicts and struggles, namely ‘subjugated’ or ‘disqualified’ knowledges – knowledges that are local, low-ranking and marginal, as distinct from coherent and systematic scientific knowledge. According to Foucault, these knowledges are important for questioning the tactics and strategies of power and power structures, and thus it is important for historical analyses to concentrate on these knowledges (Foucault 1980, 81–82). Foucault’s significance is often mentioned in studies of scientific controversy and conflicts. Such studies particularly refer to Foucault’s interviews and writings in the 1980 book *Power/Knowledge* (Fisher 1988, Fisher 1990, Gieryn 1995, 417, Meskus 2009, 23–24). Studies that use Foucault as a background have tackled the legitimization, classification and control processes that are intertwined in scientific struggles where different knowledges meet (Fisher 1990, 112–113).

The sociologist Pierre Bourdieu viewed science as a site of competitive struggle, a field where scientists struggle for recognition and scientific authority (Bourdieu 1975, 19). He emphasised the dynamics of the scientific fields of struggle, and paid attention to the hierarchies of the university, scientists’ legitimization processes and their struggles for authority (Bourdieu 1975, 20–23). He stressed that science demarcates the things that deserve the name of science and those that do not, and that it decides to exclude heretical productions from science. The gatekeeping functions of the academic community are an important feature of science (Bourdieu 1975, 30). According to Bourdieu, each actor (or agent) of science holds a position based on their social trajectory or ‘symbolic capital’, which limits or increases their ability to change the scientific field in question. He claimed that the members of different generations in science – for example, ‘newcomers’ and the ‘old guard’ or ‘dominant group’ – experience different social conditions in ‘the social play of forces’ on academic battlefields defining right and wrong in science (Bourdieu 1975, 30–34). Insights from Bourdieu’s work have informed studies that address scientific controversy and conflict (Gieryn 1995, 417, Epstein 1995, endnotes 1 and 2, Gieryn 1999, 23, Lamont and Molnár 2002, 186, Burri 2008, 38–39). Studies inspired by Bourdieu have deployed the idea of demarcation as an inherently strategic set of actions by individual scientists. Such studies have highlighted scientists’ search for recognition and their interests in scientific struggles (Gieryn 1999, 23).

The works of Merton, Foucault and Bourdieu highlight science as a field of power and an endeavour characterised by struggles for authority. They stress that science is an exemplary location of social struggles with hierarchies and power. I adopt this perspective as a central viewpoint on the boundary-work of nursing science. Thus in this work science is considered as strategic and practical action in which questions of authority, justification and power play a great role (Gieryn 1999, 23). Boundary-work is understood as a manifold legitimation process in which the manifestations of power and hierarchy become explicit in rhetorical forms, such as when statements are made about the theses produced by a discipline, or when a professor in the discipline responds to critique from the scepticism movement. This work concentrates especially on rhetorical power and its explicit forms in textual data. Furthermore, Merton, Foucault and Bourdieu understand science not only as the natural sciences – which tended to be the focus of Popper, Quine, Duhem and Kuhn – but as including all university disciplines and academic communities. Merton's norms help us to examine the internal norms of many disciplines; Foucault's analysis of subjugated knowledges directs us towards the forms of marginal and subjugated knowledges that are separated from science in boundary-work. These theoretical works present science as part of a larger society, and they have helped to sharpen the focus of social studies of science on science's internal practices. In this case such attention is directed towards intradisciplinary boundary-work in nursing science.

Research in the sociology of professions has highlighted the standing of professionals in a society based on certain types of knowledge ownership (Torstendahl 1990, 3). Scientists form the type of profession – a profession of professions – that has highly extended autonomy (Torstendahl 1990, 5, Collins 1990, 21), and that tries to acquire control and power over knowledge through different strategies, similarly to other professions such as law and medical practice (Gieryn 1995, 411, Taylor 1996, 95–96). Professions have privileges that grant them a certain power to defend themselves against intruders from the society outside the profession (Torstendahl 1990, Abbott 1988); in the case of academic science, this particularly concerns the 'amateur-professional demarcation', as characterised by Shapin (1982, 173). Research has paid particular attention to the projects of legitimation and academisation by various professional groups who seek to gain power by raising their status in the hierarchy

of professions, in which non-elite professional groups are subordinated by elite professions (Torstendahl 1990). The sociology of professions has analysed status hierarchies, in both academia and workplace settings (Abbott 1988), that lead to struggles and conflicts between and within expert and professional groups (Larson 1990, 39).

Research in the sociology of professions has pointed to the academic profession as a special case in which knowledge plays a particularly strong role. These studies have revealed that the same characteristics that apply to other occupations also apply to the academic profession. Academics struggle for the legitimation and autonomy of their profession. The case of female-dominated health professions has gained special emphasis in the sociology of professions, as they exemplify the ways in which professional boundaries are tied to gender and patriarchal boundaries (Katz 1969, Witz 1992, Davies 1995, Macdonald 1995, Abbott and Meerabeau 1998, Henriksson and Wrede 2004). Gendered boundary struggles have also been identified by studies focusing on academic work contexts (for references, see Meerabeau 2005, 130). In the discipline of nursing science, professional knowledge and scientific knowledge are in many ways intertwined. These perspectives are important for this study, as they suggest that the separation of science from professional practices could be considered as one form of boundary-work. Perspectives from the sociology of professions suggest that the boundary-work between science and society might consist of linkages between science, the professions and the development of professional education.

From the 1970s onwards, two approaches that focus on controversies in science emerged: the strong programme and interest theory. The strong programme, explicated by David Bloor in 1976's *Knowledge and Social Imagery*, holds that all knowledge that is considered knowledge by some actor should be studied by sociology. Bloor stated that knowledge must be studied impartially with respect to its truth or falsity, rationality or irrationality. The study must be symmetrical in the sense that all forms of knowledge – psychology as well as parapsychology, true and false beliefs alike – must be explained in terms of the same types of causes (Bloor 1976, 2, 5). For example, Bloor studied the debate between Popper and Kuhn, and aimed to '[put] the debate into a much wider perspective than usual by relating it to long-standing controversies in economics, jurisprudence, political theory and ethics' (Bloor 1976, 48).

In a similar vein, interest theorists emphasise the role of social interests and the negotiations involved in the development of scientific knowledge. Through careful case studies of controversies, these theorists attempt to study the conflicting interests of the opposing sides in scientific disputes (see the concrete examples in Barnes 1977, 58–69). Thus this school of thought considers controversies as stemming from the background interests of the opposing actors in a conflict, or ‘the prior agreements and disagreements between individual experimental contexts’ (Pickering 1981, 66). Controversy studies related to this tradition have brought attention to ‘the social processes which determine the outcome of the debate’ (Collins 1981b, 53). This approach has sought ‘to locate the controversy in its wider social context, to outline the social interests and determinants which may lie behind it and to analyze the political consequences of various solutions of types of closure’ (Brante and Elzinga 1990, 42).

Controversy studies developed on basis of these two approaches emphasise that controversies can arise from inside science, outside science or from both directions, and that they can be initiated by researchers themselves, administrators, politically and socially aware public actors (such as companies or policymakers), different lay actors, or the general public. Scientific controversies are understood as situations of tension or conflict in which researchers argue with each other or act as participants among other public actors. The controversies often involve clearly distinguishable courses of action in which disagreements or conflicts over scientific interpretations in the production of new knowledge come to the fore (Nelkin 1979a, 16). Controversies can be caused by cognitive incompatibility (Nowotny 1975, 43), the developmental stage of science (Gavroglu 2000), or the accumulation of pressures from outside science.

Controversy studies have shown that science is political and social. They have provided insights on the embeddedness of science in society and culture. They highlight that scientific boundaries are drawn within certain societal limits and infrastructures. Controversy studies have broadened our understanding of science’s societal prerequisites and the intertwining of science with political decision-making, public institutions, administration, the economy and the general public. They have opened up our awareness of the norm systems and power structures of science. However, they have concentrated on the characteristics of controversy situations and their exceptional nature,

rather than emphasising the continuous processes of boundary definition.

For this thesis, controversy studies are the main source of inspiration and the focal point of reference. However, the early studies on interests and negotiations mainly focused their attention on researchers and their background motivations. Gieryn, the developer of the concept of boundary-work, and his followers line up with controversy studies in this respect. Controversy studies also heavily emphasise the interplay of science with society, and concentrate on large, contentious topics in public debates, such as climate change, or ethical dilemmas in medicine or technological development – issues that are regarded as having the potential to destroy life, undermine the economy or create environmental problems. These big issues have tended to marginalise those supposedly less interesting disciplines that do not pose such direct threats. Moreover, the focus on big issues has meant that the theoretical development of controversy studies has been conducted in their shadow. Even research that applies the boundary-work approach has merely repeated the concept of boundary-work, without analysing what it consists of; and only seldom has such research tackled the substance of the separations effected through boundary-work. Existing studies fail to ask what spheres of life other than society are separated from science, or how that process is rhetorically constituted. Nonetheless, controversy studies remain invaluable for this research, in that they continue to highlight that the boundary-work between science and society is fundamental to all scientific work.

The laboratory studies tradition emphasises negotiation processes in the laboratory, in scientific practices at the level of rhetoric and talk, as essential to the production of facts (Latour 1987, 22–62, Knorr Cetina 1981, 5, 86). Karin Knorr Cetina (1981, 87) argues that ‘oscillations between conflict and cooperation, between the fission and fusion of interests, are routine correlates of the moves agents [of science] make in the hidden process of negotiation.’ Latour (1987, 30) stresses that when researchers are interested in the ‘actual practices’ of science, they end up getting ‘into the midst of controversies’. Laboratory studies stress the construction of facts as a constant negotiation in interaction with locally situated actors. They also concentrate on scientists’ representations and techniques of persuasion. Knorr Cetina calls these ‘epistemic cultures’, which inevitably contain cultural divisions (Knorr Cetina 1999, 2).

Laboratory studies turn their gaze towards controversies and debates in science (Taylor 1996, 75–92, Gieryn 1999, x). These studies have provided an approach to the habitual and continual nature of controversies in science, and also to the necessity of controversy for the development of scientific practices (Gieryn 1995, 404–405, Taylor 1996, 80). This tradition has led controversy studies to concentrate on practices that discursively and locally define science and separate it from other cultural areas (Knorr Cetina 1995). Through ethnographic study, the notion that knowledge is negotiable, is defined by actors themselves and must be treated with careful contextualisation has become dominant in controversy studies (Knorr Cetina 1995, 141, Taylor 1996, 71, Gieryn 1999, ix). Although laboratory studies can be considered a subgroup of controversy studies, in that they concentrate on the natural sciences and technology, importantly for this thesis they have also opened the door towards a consideration of science as part of, and as in interaction with, broader culture.

Similar in origin to laboratory studies, anthropological approaches to science have enhanced the consideration of science as a local and culturally situated phenomenon that can be compared with other cultural phenomena (Gieryn 1995, 416, Gieryn 1999, 4, Edwards, Harvey and Wade 2007, introduction). Anthropological research has paid attention to cultural values and elements, such as the social differences caused by the exploitation or marginalisation of certain groups and the dichotomies effected by the comparison of male and female or Western and non-Western. Cultural elements have been revealed as permeating even the cognitive, technical core of Western sciences (Figueroa and Harding 2003, 2, Gieryn 1999, 5).

The anthropology of science emphasises that science is always related to power, and that this causes conflicts and disputes. These studies have highlighted the impact of societal forces and cultural values and interests on knowledge-making (Watson-Verran and Turnbull 1995, Asquith 1996, 239–240, Harding and Figueroa 2003, 4–6). The feminist and post-colonial philosopher Sandra Harding (2006, 5) has claimed that Western science has pushed aside the knowledge systems of other cultures and associated them with magic, superstition, religion and other forms of irrational thought (see also Nader 1996, 4, Harding and Figueroa 2003, 2–3, Harding 2006, 3, Harding 2008, chapter 5). As a consequence, controversies arise in and around science (Watson-Verran and Turnbull 1995, 137).

Anthropological approaches to science are important in this study because they have addressed the boundaries of scientific knowledge broadly, including conceptions of the primitive and the civilised, the traditional and the modern, the local and the universal, superstition and rationality, practice and theory, the developed and the underdeveloped, and religion and science, in terms of the knowledge they produce, and of what is considered knowledge in some settings and not in others (Midgley 1992, Nader 1996, Figueroa and Harding 2003). Anthropology has stressed that all knowledge systems – not just Western scientific knowledge – must be taken into account and scrutinised equally, and such research has thus acted against the privileging of any one knowledge system over others. Anthropological perspectives are also very important for the study of nursing science, because the roots of the latter lie in traditional knowledge about caring, healing and nursing.

Feminist studies of science have analysed the role and status of women in science and technology since at least the 1970s (Fox 1995, Keller 1995). They have highlighted the marginalisation and exclusion of women and women's knowledge from science (Keller 1985, Harding 1986 and 1991, Schiebinger 1989). This research tradition has paid attention to gender as a factor that creates some boundaries and enforces others in science, such as those of race and social inequality (Gieryn 1995, 420, Condit 1996, Harding 2008, chapter 4). It has stressed that women's knowledge has been labelled non-science, which has led to the demarcation of some areas of life as more feminine and as excluded from science, and others as more masculine and as included in science (Gieryn 1995, 421, Oakley 1993, 214, Keller 1995, 82–83). These studies have claimed that the value-neutrality of science is a myth, and argue that there has been a division between women's and men's knowledge in which the former is less respected and the latter more valued (see Keller 1985, 7, Gieryn 1995, 422).

Both anthropological and feminist approaches have pointed out that gendered and cultural classifications are important for understanding the exclusion strategies and power configurations in scientific work which often create and enforce controversies in science (Gieryn 1995, 415–424). Importantly for this thesis, these approaches have addressed science as culture, under a broad definition of culture that encompasses the internal practices of science and its wider environment in global society. These approaches have emphasised the significance of the environment of science. They have questioned who

can define science and with what societal power. They have featured the themes of social justice and equality, which may lie in the background of science and may cause conflicts. Anthropological and feminist approaches suggest that one area of investigation for the analysis of forms of boundary-work might be the interplay of science with culture, or ‘cultural boundary-work’.

The disciplinary cultures tradition is also helpful for this thesis, since it defines the concept of discipline. This tradition has identified the characteristics of a discipline as such. A discipline has a community of researchers, students and teachers with a common intellectual commitment. It has a network of communications, and its own distinguishable tradition and history. A discipline also includes a particular set of values, norms and beliefs. It is a domain with a particular mode of enquiry and a conceptual structure of its own (King and Brownell 1966, 67–98, Becher 1989, 20). Regardless of whether all of these characteristics are materialised in a particular discipline, they nevertheless give a general idea of a discipline as such. The disciplinary cultures tradition has focused on ‘academic tribes and territories’ (Becher 1989), which in academia are strong reference points at individual and institutional levels (Becher 1989, Ylijoki 1998, Henkel 2000, 18–20, Lamont 2009, 53, Hyland 2012). From the point of view of norms, the tradition of disciplinary cultures emphasizes that norms are discipline-specific. I adopt this perspective and understand that norms are defined in a continuous process rather than as universal entities that would apply to all disciplines, which was central in Merton’s (1972) view. Norms reflect the ethos and values of the disciplines. Thus my study highlights that norms are central, for example, for the methodological and theoretical writing conventions and principles of good research conduct and other practical issues within a discipline.

The disciplinary cultures tradition has used the concept of identity in relation to discipline. By forming hierarchies and constructing outsiderhood and insiderhood, disciplinary cultures generate identities that become threatened during processes of conflict. Controversies in science appear as struggles for disciplinary territory and academic status. Conflicts evoke strong feelings and affect identities profoundly, causing rifts and schisms between individuals, and shifts in disciplinary temperaments (Becher 1989, 98, Lamont 2009, 55). Writing on higher education, Mary Henkel (2000, 19) states that a discipline comprises ‘a physical structure and a set of accredited, collective functions, through

which academics consolidate and refine their disciplinary identities'. According to her, the individual members of a discipline's community place themselves on the map of disciplinary knowledge, and in this way build the configuration of the discipline. In my thesis I adopt Henkel's position and define disciplinary identity-work as the definitions that individual members of a discipline make of that discipline, its norms, its location on the map of disciplines, and specific practices. Membership of a discipline may be constituted by the actors themselves or by others.

The disciplinary cultures tradition has also enhanced understanding of the tensions within disciplines, and disciplines' different ways of addressing them. Disciplines have different controversies and conflicts, depending on their place in the scientific system. For example, disciplines have different relations to society, which means that there are also differences in how they are expected to react to societal needs and aims, and that different themes are likely to give rise to controversies in society. These prerequisites of science are present in researchers' everyday lives, although they might be muffled or silenced (Becher 1989, 99–100). Disciplinary gatekeeping practices can be potential causes of conflict, since they involve a limited number of individuals taking the power to decide what is important and what is not, thereby deciding about the future of a greater number of researchers (Becher 1989, 60, Lamont 2009, 58–59). From the point of view of the approach adopted in this thesis, the disciplinary cultures tradition provides resources such as the concepts of discipline, disciplinary identity and disciplinary identity-work. These help us to analyse the internal dynamics of a discipline, and are useful for tackling boundary-work within a single discipline. They suggest that boundary-work may be intradisciplinary when it concerns the discipline's internal affairs or disciplinary identity.

Research on interdisciplinarity has analysed the relationships between disciplines, the formation of new disciplines, and the forms of interdisciplinary research. This tradition has used the concept of boundary, which is seen as separating disciplines from one another. This means that individual disciplines have a boundary or boundaries within which their domain is defined against other disciplines. However, a discipline's boundary can also include other relations, as the interdisciplinarity researcher Julie Thompson Klein explains in her book *Crossing Boundaries* (1996, 4–5):

The boundaries include demarcations of academic and popular knowledge (in esoteric versus everyday life), science versus nonscience (pseudoscience and applications of science), disciplines (physics versus chemistry or biology), subdisciplinary specialities (economic, social, and political history), hybrid fields (social psychology, environmental studies and materials science), disciplinary clusters (science, technology, social science, and humanities), taxonomic categories (hard versus soft knowledge, basic versus applied research), learning skills (integrative thinking, literacy, comparative methodology, and the ability to deal with diversity), knowledge activities (transmission versus discovery, explanation versus interpretation), knowledge forms (quantitative versus qualitative, objective versus subjective and normative), and sectors of society (industry, academe, government, and the public).

This broad classification suggests many forms of boundary-work, including intradisciplinary and interdisciplinary aspects of boundary-work and the interplay of disciplines with society. Interdisciplinary research has been seen as challenging the traditional disciplinary structure of the university (Klein 1996, 131). It has stressed the development of new disciplines, sometimes dubbed ‘interdisciplines’ (Friman 2010), as situations in which the boundaries between disciplines involve negotiation and conflict (Greenblatt and Gunn 1992, Lyon 1992, Klein 1996, chapters 4 and 5). Persuading scientists to change their ‘conflicting intellectual and professional allegiances’ (Ceccarelli 2001, 1) in favour of interdisciplinary research involves elements that cause conflict and contradiction.

Interdisciplinarity research has defined the forms of interdisciplinary research. In multidisciplinary research, a single discipline uses and benefits from the knowledge base of other disciplines. In a multidisciplinary research team, the different disciplines work separately, and there is no aim to combine knowledge from different disciplines. In interdisciplinary research the disciplines integrate data, methods, tools, concepts and theories in order to create a common understanding of an issue. In transdisciplinary research, researchers work collaboratively to solve certain problems, regardless of their individual disciplines (Bruun, Hukkinen, Huutoniemi and Klein 2005, 28–32, Huutoniemi 2012). The interdisciplinarity approach has highlighted that in the different forms of interdisciplinarity, distinctions, tensions, conflicts, contests and misunderstandings may appear (Klein 1996, 4–5, Mikkeli and Pakkasvirta 2007, 97–98, Petts, Owens and Bulkeley 2008).

As this thesis is about one discipline, it is helpful to use the concepts of disciplinary boundaries and the different forms of interdisciplinarity as reference points when analysing the boundary-work of nursing science. The interdisciplinarity approach suggests that boundary-work may be interdisciplinary when it handles relationships between disciplines and defines one discipline in comparison with others. Moreover, Klein's classification provides a starting point for a broad categorisation of boundary-work.

Disciplinary cultures and interdisciplinary approaches have highlighted that controversies and conflicts are inherent and essential to science. By introducing the concepts of boundaries, boundary crossings and boundary protection, these studies have directed attention to the flexibility and changeability of the boundaries of science, and the refashioning of many boundaries simultaneously. They have stressed the processual development of science, in which individual identities as well as scientific paradigms may be set in opposition with other identities and paradigms (Becher 1989, 98–100, Henkel 2000).

Studies based on the social-worlds framework, drawing from symbolic interactionism and pragmatism, have revealed that scientists do their work at the crossroads of different social worlds, especially the worlds of amateurs, professionals, academics and lay people (see for example Gieryn 1983, 412–415, Clarke and Star 2008, 123–127). These different social worlds have different ways to process, understand and interpret knowledge, and this requires that the actors negotiate and translate knowledge and reconcile their perceptions and ways of thinking with each other (Star and Griesemer 1989, 387, 389; on translation see also Latour 1987, 108–114).

The social-worlds framework has used the boundary metaphor in many ways, and has found new theoretical concepts to understand how boundaries of science are both maintained and overcome. Many studies within this framework have focused on cooperation at the boundary (Guston 1999, 103). Fujimura (1988, 261, 278) develops the concept of the 'standardised package', which acts as an interface or a means of communication among different social worlds. Her example comes from cancer research, where she analysed how specific theories and technologies linked different people and organisations. Guston (1999, 88, 106) uses the concept of the 'boundary organisation' of technology transfer offices, which not only separate science from other activities but also try to unite and work towards overcoming

science's boundaries with politics, for example. In their widely cited article, Star and Griesemer (1989, 404, 410–411) point out that in the meeting of different social worlds, some objects, artefacts or concepts may become boundary objects which are understandable by different actors. These boundary objects enhance communication between different social worlds, provide common standardised starting points and road maps for discussion, and outline the phenomenon in which the different social worlds have a stake.

From the point of view of my research, the social-worlds framework is most beneficial when it theorises the situations where multiple social worlds are present but do not necessarily meet or even attempt to find common forms of communication. Studies based on the social-worlds framework have emphasised the diversity of social worlds in science and the lack of consensus in scientific action. They have revealed a multiplicity of perspectives rather than a consensus, and the existence of heterogeneous voices rather than unified views in science at the intersections of different social worlds (Clarke and Montini 1993, Clarke and Star 2008). Moreover, they have pointed out the boundaries between social worlds and the processes of legitimation through which boundaries in science are established and enforced (Gerson 1983, 358). Boundary objects may be the only uniting factors where there is no consensus on other issues (Star 2010, 602). It has also been noted that in situations where consensus and collaborative effort are needed, the meeting of social worlds does not always succeed, and indeed can even fuel controversy and conflict (Tuunainen 2005a, 224). Likewise, situations where multiple social worlds intersect can become 'contentious arenas composed of heterogeneous actors' (Clarke and Montini 1993, 42). From the point of view of the forms of boundary-work, it is not especially relevant whether individuals from different social worlds do or do not meet in a given conflict situation. The social-worlds framework is most fruitful for my thesis in that it sees controversy situations as arenas where there is 'a multiplicity of perspectives, heterogeneous voices, meaningful silences, and silent implicated actors' (Clarke and Montini 1993, 68).

This section has introduced studies from the different traditions that form the background of boundary-work studies. The various traditions indicate that demarcations, controversies and conflicts in science take different forms. Most usually the boundary-work between science and society is emphasised in controversy studies and

strengthened by the sociology of professions and social-worlds approaches. This is an important and valuable contribution from previous studies. However, merely repeating this notion will not develop studies on demarcation, controversy and conflict in science theoretically. It also does not do justice to science's various linkages: within the discipline, as historical-philosophical studies, the sociology of science and the disciplinary cultures approach reveal; between disciplines, as interdisciplinarity studies points out; and with culture more broadly, as laboratory, anthropological and feminist studies indicate. The contribution of this study is to develop the understanding of demarcation, controversy and conflict in science theoretically by identifying various forms of boundary-work. Its aim is to find the connections between nursing science and many spheres of life, from within the discipline, between disciplines, between science and society, and between science and culture.

A framework for analysing forms of boundary-work

Focusing on the forms of boundary-work means that the diversity of boundaries drawn at the same time or in the same conflict is taken as the starting point of the research. Some researchers have classified the tensions, juxtapositions and forms of boundary-work. I will now present these classifications before I introduce my own framework, which seeks to capture the forms of boundary-work within nursing science.

Lyne and Howe's (1990) typology classifies discourses of expertise into intradisciplinary, interdisciplinary and extradisciplinary discourses. Lyne and Howe (1990, 136) describe intradisciplinary discourses of expertise as seeking to advance the discipline; the expert's primary audience in this negotiation is other members of the discipline. Interdisciplinary discourses, according to Lyne and Howe (1990, 137), occur when the expert takes up the role of negotiating the place of the discipline among other disciplines. This classification is especially useful for grasping the boundary-work that concerns elements within a discipline, and also the boundary-work that situates the discipline among other disciplines. I have partially adopted the concepts proposed by Lyne and Howe and used them in relation to boundary-

work – hence the terms ‘intradisciplinary boundary-work’ and ‘interdisciplinary boundary-work’. However, I do not see these dimensions of boundary-work as being performed exclusively by the experts or representatives of the discipline; other actors may also do intradisciplinary and interdisciplinary boundary-work. Lyne and Howe (1990, 140) also have a third category, extradisciplinary discourses, in which the expert targets her or his message at non-disciplinary audiences and aims to teach or advocate science. However, I see this category as too broad, and it does not fit a study that aims to grasp the broadly cultural elements of boundary-work.

A broad categorisation of the boundaries that are at stake in the emergence of interdisciplinary research is given by Klein (1996, 4–5). Like Lyne and Howe, Klein maps out intradisciplinary³ and interdisciplinary⁴ boundaries. Moreover, she mentions science’s boundaries with different sectors of society. Klein discusses the interplay between industry, academia, the government and the public. I find her categories of intradisciplinary and interdisciplinary boundary-work useful. I have also developed a third category derived from the broad literature review and Klein’s ‘sectors of society’, which I decided to call ‘boundary-work between science and society’.

A collection of articles by Nelkin (1979a) studies decisions concerning the political and social values of science and technology. The book classifies four types of tension or juxtaposition: 1) the juxtaposition of technological efficiency and the investments and interests of individuals, for example in the siting of nuclear plants or airports; 2) the contradictions between the benefits and risks of new technologies, for example in the siting of nuclear waste; 3) tensions between citizens’ safety and individual freedom of choice, for example in the dilemma between citizens’ safety and the individual’s free choice not to wear a seatbelt; and 4) the tensions between science and traditional values, such as religious or moral values in relation to foetal research (Nelkin 1979a, see also Nelkin 1995). The categorisation was made to demonstrate the intertwining of science and politics and the

³ Intradisciplinary boundaries proposed by Klein (1996, 4–5), in my view, are as follows: taxonomic categories (hard vs. soft knowledge, basic vs. applied research), learning skills (integrative thinking, literacy, comparative methodology and the ability to deal with diversity), knowledge activities (transmission vs. discovery, explanation vs. interpretation) and knowledge forms (quantitative vs. qualitative, objective vs. subjective and normative).

⁴ Interdisciplinary boundaries proposed by Klein (1996, 4–5), in my view, are as follows: subdisciplinary specialisms (economic, social and political history), hybrid fields (social psychology, environmental studies and materials science) and disciplinary clusters (science, technology, social science and humanities).

societal limits of science. While these types of tension arising from technological decision-making differ from the forms of boundary-work that are the focus of my research, I see this early study as supporting the view that there are multiple dimensions of boundary-work. Furthermore, it gives hints as to the elements that boundary-work between science and society might involve.

Macklin (1987, 619) classified the types of controversies in science broadly as follows: 1) within science, controversies over fact, theory, methodology and principle; 2) related to science, social controversies over the content or process of science; 3) controversies involving technology; 4) political and legal controversies; and 5) moral controversies.⁵ This classification strengthens the ideas of boundary-work within science and boundary-work between science and society. It also acts as an example of a typology of controversy that seems to be very good at grasping controversies in the natural sciences, medicine and technology. There are concepts such as ‘facts’ and ‘technology’ that connect the boundary-work in these fields. However, the typology seems to omit cultural aspects altogether.

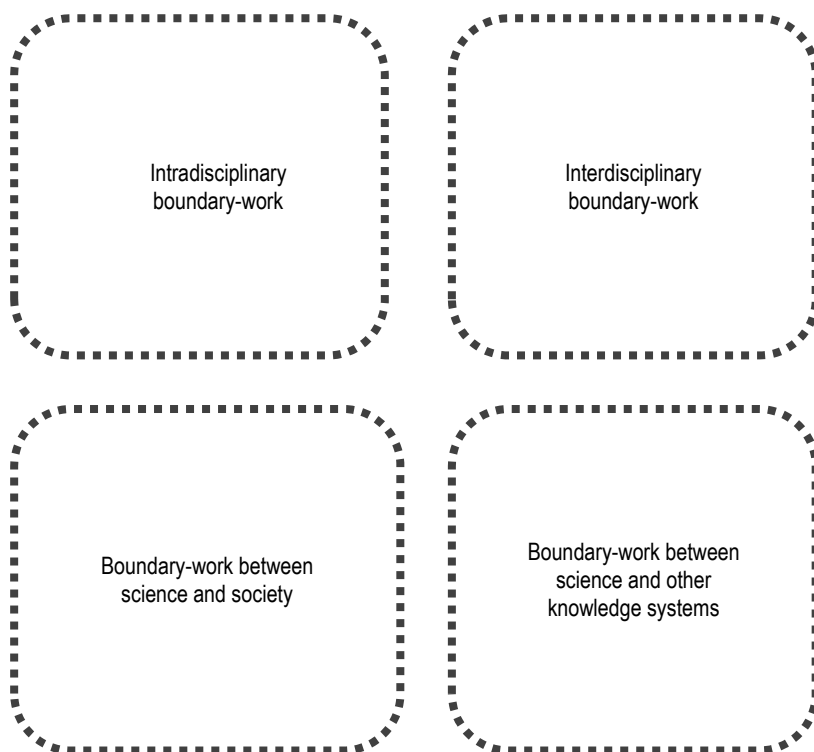
Anthropological studies have emphasised the cultural divisions between Western science and other knowledge systems. These studies, however, do not focus on the conceptual development of boundary-work, and thus they have not produced any useful category with which to define the cultural boundaries of science. The concept ‘cultural boundary-work’ seems to be too broad and abstract. Anthropological studies also heavily use the concept ‘knowledge’. Hence the last category is called ‘boundary-work between science and other knowledge systems’.

The framework of this study is presented in figure 1. It will be used to analyse forms of boundary-work in nursing science. The framework concentrates on the multidimensionality of boundary-work, and aims to capture the full variety of the boundaries that are worked on. The framework has four dimensions: intradisciplinary boundary-work, interdisciplinary boundary-work, boundary-work between science and society, and boundary-work between science and other knowledge systems. The research questions are specified accordingly: what forms do intradisciplinary boundary-work, interdisciplinary boundary-work, boundary-work between science and society, and boundary-work between science and other knowledge systems take in nursing science?

⁵ For other similar classifications, see McMullin (1987) and Brante and Elzinga (1990, 38).

What kinds of qualities and characteristics of nursing science are produced in the different forms of boundary-work?

Figure 1. Framework for analysing the forms of boundary-work



3. Methodology and research material

Nursing science as a case study

This study focuses on two conflicts in the mid-1990s in nursing science at the University of Tampere in Finland. The case of nursing science was selected on the basis of two assumptions. The first assumption was that a greater abundance of boundary-work can be found in conflicts involving emerging disciplines, such as nursing science, than in conflicts involving strong, established and widely studied disciplines, such as the natural sciences, technology or medicine.⁶ The second assumption was that the academic status of nursing science is susceptible to negotiation. The term ‘nursing science’ is used throughout the thesis to refer to the branch of science that concerns academic teaching and research of and about nurses and

⁶ Examples of studies concerning controversies and conflicts in the natural sciences are to be found in Engelhart and Caplan (1987), Brante, Fuller and Lynch (1993), Machamer, Pera and Baltas (2000), Mellor (2003), Shapin and Schaffer (1985), Rudwick (1985) and Ceccarelli (2011). Examples from medicine include studies on psychiatry (Engelhart and Caplan 1987, Hacking 2000, Holmquest 1990, McOmber 1996), on cancer care and therapies (Markle and Petersen 1987, Engelhart and Caplan 1987, Scott, Richards and Martin 1990, Keränen 2005), on genetics (Kerr, Cunningham-Burley and Amos 1997) and on foetal period care (Maynard-Moody 1979, Meskus 2009). Examples of technology controversies concern the application of technology (Nelkin 1979), airport expansion (Milch 1979), nuclear power plants (Nelkin 1979b, Fallows 1979, Engelhart and Caplan 1987) and airbag technology (Reppy 1979). From the point of view of the risks involved in technology and scientific innovations, environmental debates have been analysed (Hoppe and Pranger 1993, Väliverronen 1996, Allen 2004). These studies analyse how social movements challenge the knowledge provided by science; for example, the use of vaccinations for health prevention, or knowledge provided to handle environmental risks such as climate change (Brown and Zavestovski 2004, Hess, Breyman, Campbell and Martin 2008, 477). Studies have revealed that tensions can arise between science and social movements because scientists may unwillingly end up at the centre of public controversy (Hess et al. 2008) or may be forced into situations where they have to strike a balance between maintaining the autonomy of science and engaging in public debate (Allen 2004, 430). The health and environmental consequences of different technologies and applications of natural science and medicine, such as antibiotics in cattle breeding, genetically modified crops, stem cell research, information technology, global warming, vaccinations, biofuels and nanotechnology, have also been studied (Kleinman et al. 2005, 2008 and 2010).

nursing.⁷ In Finland the research community refer to themselves with the term ‘nursing science’. For example, the Finnish research journal is named *Nursing Science*. This was an ideological choice on the part of the researchers, since in some countries the discipline is called ‘nursing research’ or simply ‘nursing’. The term ‘science’ in the name of the discipline connects the discipline to the academic rather than the professional sphere. I have chosen to use the term that the early developers of the field utilised themselves.

Established disciplines by definition have a certain status, and their methodology or theoretical underpinnings are not easily destabilised by scientific controversies and conflicts. The situation is different for emerging disciplines, as they have to justify their existence in relation to the older disciplines (Becher 1989, 141). The emergence of a new field is a radical situation that essentially entails boundary-work (Klein 1996, 79). New disciplines aim to change some aspects of the scientific system, which means that they are vigorously debated (Brante 1987, 30–31). This includes the questioning of the methodology and theories of the new field. Departments of nursing science are often set up in close connection with medical faculties. The conflicts studied in my research took place in a department within the medical faculty of the University of Tampere; this made the issue of the emerging discipline’s position within the more established field especially relevant.

The case of cold fusion may illustrate the difference in the way in which established disciplines are questioned. In the fields of physics and chemistry, a claim by two researchers from the United States to have observed a nuclear fusion reaction at room temperature briefly gave rise to suspicion about the credibility of physics. However, analyses of the controversy show that the researchers were very quickly deemed unscientific, and that this was done by referring to the principles of natural science and the traditional rules of empirical

⁷ ‘Science’ in this thesis is used with a very broad meaning. It encompasses a variety of disciplines inside the academy, from the natural sciences to the humanities, social sciences and technology, and also includes profession-oriented applied fields. This usage stems from my native language, Finnish, in which the direct translation of the word science (*tiede*) is ‘the organised wholeness of information obtained with the systematic and critical study of phenomena’ (Kielikone 2012). The Finnish word refers to all fields. I aim to be consistent in my use of the concept ‘science’, since work analysing science needs to use this concept in relation to all fields. The term ‘discipline’ is used flexibly to refer to the branches of science. For example, there are disciplines of sociology, physics and nursing science.

research. The credibility of science was rapidly re-established (Taylor 1991, Lewenstein 1992, Collins and Pinch 1993, Taylor 1994, Taylor 1996, chapter 6, Pinch 1996, Gieryn 1999, chapter 4, Gross 2006, chapter 9).⁸

In the case of nursing science at the University of Tampere in the mid-1990s, the methodology of the discipline was not stable, and was under constant negotiation. At the time of the conflicts, the department was establishing its research and the first PhD theses had been completed, but the methodology was still at an early developmental stage. This can be seen, for example, from the number of methodological articles by researchers in the department that sought to justify and promote qualitative methodologies, and from the first dissertations, many of which used qualitative methodology.⁹ These departed from the line of empirical and natural science-oriented research within the medical sciences, which formed the majority of research in the faculty. Thus the researchers had to justify their choices in the face of medical methodology. The theories in the new discipline also differed from those in the medical sciences, which necessitated discussion and in-depth justification of its theoretical underpinnings. These discussions are exemplified in the wealth of discussion articles by the department's researchers justifying the new discipline theoretically and clarifying its theoretical roots.¹⁰

The difference between established and emerging disciplines is crystallised in cases where the existing consensus among scientists is challenged by the general public. This is exemplified in the rivalry between creation science and the theory of evolution, particularly in the context of the United States (Nelkin 1979a, Lessl 1988, Taylor 1996, chapter 5, Ceccarelli 2011).¹¹ Scientists involved in cases like this receive strong backing from their community, and their unanimity

⁸ For a complete list of studies of the cold fusion case, see Gieryn (1999, 184–186).

⁹ Articles in *Nursing Science*: Åstedt-Kurki (1994), Nieminen and Åstedt-Kurki (1993) and Liukkonen and Åstedt-Kurki (1994). PhD theses before the PhD on fasting: Nojonen (1990), Kiikkala (1991), Åstedt-Kurki (1992) and Munnukka (1993).

¹⁰ Articles in *Nursing Science*: Kalkas (1990), Krause (1993), Kalkas (1994a) and Kalkas (1994b).

¹¹ The case has been special in controversy studies because it is connected with the debate about constructivism in science studies and the relation of sociological-historical studies of science with 'hard' science in the so called science wars (Segerstråle 2000a, chapter 17). More on the science wars in Segerstråle 2000b, Labinger & Collins 2001, Sismondo 2005 and special issue of *Science Studies* 1/1996. A similar case was aroused by Alan Sokal, see Sokal 2008.

defeats the public challenge (Ceccarelli 2011).¹² In new and emerging fields the consensus either does not exist or is restricted to a small community of scholars. In the case of the nursing science department at the time of the conflicts, it was not a large scientific community, nor was there a community in which consensus would be evident and backing from other scholars secured. The nursing science community at the University of Tampere was so small that a single professor might have to answer questions about the discipline alone. Such a small group is easier to challenge than the large, strong communities to be found in established fields.

Another important difference is that emerging disciplines have a more direct link with the public than many more established fields, including the natural sciences. Nursing science is directly linked to the welfare of the population and its organisation through the work of welfare professionals. Nursing professionals form an important public for nursing science, and their expectations therefore also make the discipline less independent and less of a separate sphere. Furthermore, most academic nursing scholars have links with nursing work. They are required to hold a nursing qualification, which means that they must have worked in nursing, and they may have dual roles in nursing work and academia¹³. Established fields such as the natural sciences and technology do not have such direct links with the profession, even though science affects the public and public decisions. In previous research this difference has been cited to explain why the ‘social- or science-based professions’, as Becher calls disciplines such as nursing science, have not been studied as much as disciplines within the natural sciences and technology (Becher 1989, 15).¹⁴

¹² Ceccarelli (2011, 196) calls these types of controversy ‘manufactured’: ‘A scientific controversy is “manufactured” in the public sphere when an arguer announces that there is an ongoing scientific debate in the technical sphere about a matter for which there is actually an overwhelming scientific consensus.’

¹³ At the time of the international evaluation of the discipline (Academy of Finland 2003, 9), all universities (Helsinki, Tampere, Turku, Oulu and Kuopio) except Åbo Akademi required a background in nursing.

¹⁴ The emphasis on the natural sciences is crystallised by McMullin (1987, 91): ‘The reader will have noted that this argument bears on the natural sciences only. The structure of the debate is much more complex in the social sciences, and resolution is correspondingly more difficult to attain there. The role of the explanatory theory is crucial to the resolution of most controversy in the natural sciences. Such theories are rare in the social sciences. Furthermore, political and social value differences are often integral to controversy in economics and sociology, whereas they must be counted as nonepistemic factors where the natural sciences are concerned. For these and other reasons, the means of resolution of deep-rooted controversies in the social sciences are often not very effective. My treatment of scientific controversy in this essay has had to be restricted to

The development of nursing science has been characterised as an attempt to form a scientific basis and a knowledge base for the work of nurses, who constitute a growing profession within the welfare state (Torstendahl 1990, 2–3, Laiho 2005, 37). In this trend towards professionalisation, a science base and higher education were seen as routes out of subordination and a low position in the hierarchy (Rinne and Jauhiainen 1988, 160). The struggle for professional autonomy attempted to develop a separate field of knowledge for the female-dominated occupation of nursing, separate from medicine, in order to fight for better professional positions and more equal salaries with medical practitioners (Rinne and Jauhiainen 1988, 161, Hermanson 1986).

As a consequence of its direct link with the profession, nursing science has been expected to serve, guide and assist nurses and their work. It is expected that nursing science will act as a companion, initiator, evaluator and administrator of nursing practice. However, the reception of nursing research among nurse practitioners has not always been welcoming, and there is a wealth of discussion in the field about the theory-practice gap (Gallagher 2004, Maben, Latter and Macleod Clark 2006, Nieminen 2008). The trend towards academisation has met with resistance from nurse professionals, leading to ‘anti-academic’ views (Laiho and Ruoholinna 2008). Nursing science has been criticised for being either too practical and professional to be academic, or too academic and theoretical to serve as a ground for nursing practice and practical training (Rinne and Jauhiainen 1988, 161, Gallagher 2004, Maben, Latter and Macleod Clark 2006, Nieminen 2008, Findlow 2012).

The development of nursing science in Finland was part of a trend towards the academisation in other, similar welfare occupations, such as social work, teaching and nursery work, in order to gain prestige and authority for such work (Rinne and Jauhiainen 1988, Laiho 2005). Within this trend, the scientification of the knowledge base was seen as a way to gain prestige through university education. The institutionalisation of these disciplines in universities strove to legitimise research on the practical work of welfare professionals (Brante 1987, 30–31). Academisation was seen as a way to acquire

the simpler context of the natural sciences.’ Only rarely has attention in controversy studies been on social sciences (Salmon 2000, of anthropology, Ashmore, Brown & Macmillan 2005, of psychology and Fahnestock 1997, of archaeology, Gieryn 1999, of social sciences).

autonomy and control over nurse education, which had traditionally been controlled and supervised by medicine (Rinne and Jauhiainen 1988, 133).

After the first nursing science curriculum was established in Finland in 1979, nursing science soon acquired a fairly stable university position, with own literature, terminology and tradition of knowledge production, as also occurred in Anglo-American contexts (Findlow 2012, 121). Its student flows were fairly large from the beginning, but a weak point was that the students were mature, female and practically oriented, with heavy family and work responsibilities. This contributed to the low academic status of the discipline, alongside other professional-vocational fields (Findlow 2012, 121). Questions have been raised as to whether nursing science has managed to acquire a position where it can independently define its own scope and control its own boundaries (Findlow 2012, 121).

Traditionally research has been a male-dominated domain, and most scientists in the traditional, established disciplines have been males, as is noted by the wealth of feminist scholarship on 'women in science' (see for example Lederman and Bartsch 2001, introduction). The word 'science' has had masculine connotations (Keller 1995a, 81). Nursing science is by many indicators a female-dominated field: its professors are usually women, men are rarely seen as researchers, and the field is mostly occupied by female students. This also applies to the nursing science department at the University of Tampere. This is a departure from the traditional gender division and gender balance of the established sciences, and that is not a helpful dynamic for an emerging discipline. It has been claimed that nursing science is 'invisible' and 'inaudible' and that it has not been able to find its own voice within academia because it is a female-dominated domain (Meerabeau 2005, Findlow 2012, 121).

In sum, nursing science is a small, emerging, profession-oriented and female-dominated discipline. It is therefore more likely to produce a rich variety of boundary-work than more established disciplines. It provides a good terrain on which to study the forms of boundary-work, and this could add substantially to previous boundary-work studies. It will also be interesting to investigate how nursing science is defined through boundary-work, and what characteristics are connected with it through that boundary-work.

Method of analysis and research questions

This study applies a rhetorical method of analysis. The benefits of rhetorical analysis for the study of boundary-work have been noted in previous studies (Potter 1996, 40, Taylor 1996, 88, Keränen 1998, 116–119, Pera 2000, 61–63). Rhetorical perspectives have been seen as fruitful for analysing boundary-work, because during these episodes the arguments and counterarguments clearly emerge, and they are formulated more carefully than in everyday exchanges of opinion (Brante 1993, 186). Rhetorical studies of scientific boundary-work have been able to elucidate the emotions and emotional appeals that are often forgotten in relation to science (Gross 2006, 28). It is suggested that boundary-work cases are particularly strong cases of persuasion, and rhetorical studies can offer insights on this (Fahnestock 2009, 182, Gieryn 1999, 25). Rhetorical studies of boundary-work can contribute to the sociology of science by interpreting conflicts and making hidden assumptions about science and scientific knowledge visible (Holmquest 1990, 251, Miller 2005, 34). That is why the rhetorical approach was selected as the method of analysis for this study.

The analysis is, therefore, embedded in the tradition of the rhetoric of science,¹⁵ the unifying threads of which are the central concept of persuasion and the study of the role of discourse in science (Harris 1991, 287, 294, Ceccarelli 2001, 3). The tradition has focused on the argumentation practices of different academic disciplines, that is, the argumentation strategies, discourses and textual practices of science (Lyne 1985, Lyne and Miller 2009, 168, Taylor 1996, 101). Introductory rhetorical studies of science (Gross 1990, Prelli 1989a) and rhetorical studies concerning different fields of science (Schuster and Yeo 1986, Nelson, Megill and McCloskey 1987, Simons 1989, Roberts and Good 1993) made the rhetorical perspective known. They also highlighted the variety of textual materials – books, scientific articles and reports, field notes, conversations, review

¹⁵ For reviews of the tradition of the rhetoric of science, see the special issue of *Argumentation* (1994, vol 8 (1)), Campbell and Benson (1996), Harris (1997), Gross (2006), Keith and Rehg (2008), Lyne and Miller (2009), Fahnestock (2009) and Segal (2009). The tradition is sometimes referred to as the rhetoric of inquiry or epistemic rhetoric (Lyne and Miller 2009, 168). Keith and Rehg (2008, 211) refer to this tradition as ‘the cross-fertilization of argumentation theory and science studies’. In Finland, Keränen (1998) introduced the field of the rhetoric of science to Finnish readers, and the study by Aro (1999) focuses on the rhetoric of Finnish sociology.

processes, discussions by scientists in public forums, material from scientific societies, images, graphs and tables – that can be used and combined to study the academic communication and argumentation practices of scientists.¹⁶ These studies also helped to position the rhetoric of science as a separate field among other fields interested in science, most importantly the sociology, history and philosophy of science (Gross 2006, 78).

Rhetoric is intertwined with the social, historical and political dimensions of science (Lyne and Miller 2009, 169). The rhetoric of science has emphasised that science is not just rhetorical, but is part of culture: science is socially negotiated among other aspects of culture (Taylor 1991). Rhetorical argumentation occurs at the interface of the linguistic, social and material components of science (Condit 1996, 102). Rhetorical studies of science cannot leave the distribution of race, class, gender and power relations outside its scope (Richards 1996, 334). It has also been stressed that scientific language use has certain social, political and epistemological consequences (Taylor 1996, 222). The study of scientific argumentation must therefore go beyond linguistic utterances, and must also consider various contextual clues with the help of contextual information. Van Eemeren (2009, 119) makes this point especially well in his handbook article on the study of argumentation: ‘To go beyond a “naïve” reading of the discourse, the analyst’s intuitions must be augmented by textual and contextual evidence, background knowledge, and relevant knowledge of the world, including knowledge about the results of empirical research of argumentative reality.’

The analysis of scientific discourse, which is intertwined with the rhetoric of science, also focuses on language use in science. This research tradition emerged in the late 1970s and early 1980s, and has influenced the development of discourse analysis in various methodological branches of discursive psychology, ethnomethodology and conversation analysis (Yearley 1981, Potter 1996, 17, Potter and Hepburn 2008, 277).¹⁷ The central idea in the analysis of scientific discourse is to stress the socially constructed nature of science, and to

¹⁶ See Fahnestock (2009). For a study combining different types of text, see Myers (1990).

¹⁷ The analysis of scientific discourse has been a somewhat marginal or less widely applied perspective in science studies (Yearley 2005, 97). However, some recent studies use the analysis of scientific discourse as a starting point. These studies confirm Gilbert and Mulkay’s findings on the diversity of scientists’ repertoires in the context of genomics (McCann-Mortimer, Augostinos and LeCouteur 2004, Arribas-Ayllon, Bartlett and Featherstone 2010).

highlight the context dependence and the variable interactive repertoires of science (Taylor 1996, 82–88, Potter and Hepburn 2008, 277, Keith and Rehg 2008, 223). A classic of the tradition is Nigel Gilbert and Michael Mulkay's analysis of biochemists' discourse in *Opening Pandora's Box*, first published in 1984. This study stresses that scientists' accounts vary from one situation to another, and that there is therefore a need to pay attention to the context dependence of meaning-making in science. Gilbert and Mulkay's central argument is that scientists' use of language varies substantially between formal and informal situations. They argue that in formal situations, such as articulations in scientific articles, scientists use an empiricist repertoire characterised by impersonal and neutral positioning that leaves no space for doubt, alternatives, incongruences or personal insights. However, in informal situations such as interviews, scientists use a contingent repertoire, which means that their dilemmas, personal characteristics, social relations and group involvements affect the way in which they speak or write (Gilbert and Mulkay 1984, 55–57, see also Gilbert and Mulkay 1980).

Being embedded in the rhetoric of science means that my main focus is on the rhetorical dimensions or 'texture of meanings' (Taylor 1996, 91) of the texts involved in the two conflicts. My study draws on the notion that several rhetorical tools are activated in argumentation during a scientific conflict. Conflicts are situations in which the actors need to use all possible argumentation in order to convince the other parties involved. The emphasis on argumentation places value on the dialogic nature of boundary-work: the actors might not have written the thing they wrote without a persuasive act by another actor (Taylor 1996, 92). The definitions of science that are enacted are thus not stable formulations or written in stone, but are situational responses to the argumentation of someone else.

My study emphasises that not only do researchers define science, but the definition of science is also a dialogic process involving lay actors and institutions – and also actors who do not say anything at all. Here my approach comes close to that of Taylor (1996, 15), who argues: 'the reformative potential of a rhetorical perspective on science requires that the opaque discursive formations of science become "equipment for living", not only for those most centrally located in them, but also for those whose lives will, for better or worse, be transformed by them.' It is therefore particularly important for the analysis of nursing science to focus not only on the most powerful

actors who have an established status in science, but also on the voices of silenced or muted actors, who may introduce new dimensions into boundary-work.

The hands-on analysis started with the first research question: what forms does scientific boundary-work take in the case of nursing science? My study asks: what forms did the scientific boundary-work take in the argumentation during two Finnish nursing science conflicts – intradisciplinary boundary-work, interdisciplinary boundary-work, boundary-work between science and society, or boundary-work between science and other knowledge systems? How were these forms rhetorically constructed with the tools of persuasion? Then the second research question, on how nursing science is defined by boundary-work, was addressed. My study asks: what qualities and characteristics were associated with nursing science by rhetorical means? How was the academic status of nursing science portrayed in boundary-work? This meant that I analysed the ‘longish list of qualities’ (Gieryn 1999, 29) of nursing science that accumulated during boundary-work.

In order to analyse the forms of boundary-work, I thoroughly read the texts involved in the conflicts, and classified those excerpts that contained some form of boundary-work under the four dimensions of my framework. After classifying the excerpts in this preliminary way, I analysed the rhetorical tools of persuasion: nominalisation, category entitlement, alignment, consensus-building, factualisation, the production of categories, detailed descriptions, quantification, extreme expressions, metaphors, lists, additions, contrast pairs, paralleling, quotation marks, hedges, contrasting connectives, negatives, modalisation, evaluative language and repetition. These rhetorical tools are fully described in the appendix.

The analysis of the rhetorical tools of persuasion focused on the ways in which boundary-work is done through argumentation and the qualities that are associated with nursing science during this boundary-work. The analysis focused on how rhetorical tools are used to produce meanings, impressions, expectations, assumptions, presuppositions and effects for the purposes of defending or protecting one’s own argumentation and persuading or reassuring one’s readers (Tannen 1979, Kuula 1999, 56–59, Jokinen 1999b, 126–130, Fairclough 2003, 55, 59). I started with a small number of rhetorical tools, identified more such tools during my analysis, and ended up with a large collection of the rhetorical tools used. After analysing the rhetorical tools, I analysed the context of each excerpt.

This was done in order to connect the text with broader relevant discussions of the discipline of nursing science. I used a variety of background material – official documents, PhD theses in nursing science, relevant journals, nursing science textbooks, background interviews and personal insider experiences – to connect the excerpts with their context. This background material is fully described later in this chapter.

The hands-on analysis of the rhetorical tools and context was conducted by photocopying the research material in full and subjecting it to preliminary analysis, after which the most important parts – those that I understood as boundary-work – were transcribed and printed onto separate sheets. The analysis was done on paper sheets by underlining and scrutinising the rhetorical tools and analysing the context with the help of relevant background material. The analysis proceeded from rhetorical tools to context and back to rhetorical tools, after which the context was reconsidered.

The chapters 4 and 5 presenting the results of the analysis - the forms of boundary-work and the qualities attributed to nursing science - capture the full range of boundary-work. The excerpts selected from the research material represent each form of boundary-work particularly well. The chapters are divided into four subchapters, each presenting the analysis of one form of boundary-work according to the framework. The qualities and characteristics of nursing science are summarised after each form of boundary-work. These summaries illustrate the kinds of qualities associated with nursing science in the argumentation during the conflicts. They are interpreted as reflections of the academic status of nursing science in the boundary-work rhetoric.

Research material

The research questions were asked in relation to research material collected from two conflicts, one over fasting and the other over therapeutic touch, in Finnish nursing science in the mid-1990s. Both are typical ‘thesis conflicts’: a conflict arises as a thesis is produced and suspicions are presented about the quality, theme and topic of the thesis. In both conflicts the thesis topics came from complementary and alternative medicine. In the fasting conflict the thesis in question was a PhD thesis; in the therapeutic-touch conflict, it was a Masters

thesis. The two conflicts thus reflect the thesis evaluation procedures of nursing science. They are exemplars of how science is constructed through typical gatekeeping processes among the academic community. Both conflicts started during the completion phase of the theses and ended after a few months. Thus the conflicts were momentary situations of active boundary-work evoking strong argumentation for a limited period, after which the discussion faded away, with no visible decision by any actor to bring the matter to a close. The conflicts over fasting and therapeutic touch were selected for closer scrutiny because they contained especially rich boundary-work argumentation. The theses aroused a lot of attention in the media and in different scientific and professional forums. The conflicts seemed to contain very many tensions and much hidden boundary-work argumentation, and many interpretations of nursing science.

The research material consists of:

- 1) documentary material: official documents from the research committee of the medical faculty in question, evaluation statements, and minutes of meetings (approximately 25 pages);
- 2) discussion material: discussions in newspapers and popular, professional and scientific journals, plus one newscast by a major national television channel (approximately 60 pages).

The research material is detailed in table 1¹⁸. The material marked with asterisks is documentary material. The table shows that there was both documentary and discussion material in the conflict over fasting, whereas the conflict over therapeutic touch produced almost solely discussion material. The therapeutic-touch conflict was richer in material than the conflict over fasting, because it contained more and longer discussion material. The conflict over fasting was more concise. All the research material was originally written in Finnish. The excerpts presented in chapters 4 and 5 were translated after they had been analysed¹⁹.

¹⁸ The research material is not included in the list of references in order to differentiate it from them.

¹⁹ The Finnish originals are, if necessary, available from me.

Table 1. The research material

Conflict over fasting
First preliminary examination statement by Arja Liukkonen 26.6.1995*
Second preliminary examination statement by Osmo Hänninen 10.8.1995*
Doctoral candidate response statement by Helena Frankberg-Lakkala 1/14.8.1995*
Third preliminary examination statement by Eino Hietanen 29.11.1995*
Statement by the opponents Katie Eriksson and Mikael Fogelholm 22.3.1996*
Doctoral candidate response statement by Helena Frankberg-Lakkala 2/1.4.1996*
Doctoral candidate response statement by Helena Frankberg-Lakkala 3/15.4.1996*
Hyvärinen, Irja 1996. Report. <i>Helsingin Sanomat</i> [<i>Helsinki News</i>] 21.3.1996
Evening news: TV news bulletin by newscaster Arvi Lind and reporter Vesa Perälampi 22.3.1996
Kangasniemi, Seppo 1996. Report. <i>Aamulehti</i> [<i>Morning News</i>], 23.3.1996
Fogelholm, Mikael 1996. Does fasting work after all? <i>Suomen lääkärilehti</i> [<i>Finnish Medical Journal</i>] 15/1996, 1717, and <i>Hyvä Terveys</i> [<i>Good Health</i>] 4/1996, 26–27
Frankberg-Lakkala, Helena 1996. Comment on the article “Does fasting work after all?” <i>Suomen lääkärilehti</i> [<i>Finnish Medical Journal</i>] 20–21/1996, 2175, and <i>Hyvä Terveys</i> [<i>Good Health</i>] 6/1996, 64
Raivio, Sinikka 1996. What are the reasons for fasting? <i>Skeptikko</i> [<i>Sceptic</i>] 2/1996, 27–28
Unknown author. Commentary. Did fasting cure after all? <i>Skeptikko</i> [<i>Sceptic</i>] 2/1996
Ollikainen, Marketta 1996. From the editor. <i>Skeptikko</i> [<i>Sceptic</i>] 3/96, 7
Frankberg-Lakkala, Helena 1996. A response to the article “From the editor” in <i>Skeptikko</i> [<i>Sceptic</i>] 3/96. <i>Skeptikko</i> [<i>Sceptic</i>] 1/97, 38–39
Ollikainen, Marketta 1997. Commentary (untitled). <i>Skeptikko</i> [<i>Sceptic</i>] 1/97, 39
Conflict over therapeutic touch
Evaluation statement on Masters thesis by Irma Kiikkala 1.6.1993**
Evaluation statement on Masters thesis by Arja Liukkonen 2.6.1993**
Meeting minutes, nursing science departmental committee, University of Tampere, 17.12.1996, present: Professor Marita Paunonen, Senior Lecturer Heli Nieminen, Associate Professor Päivi Åstedt-Kurki, Student Tiina Pennanen and Secretary Vesa Korhonen*
Nieminen, Heli 1996. Phenomenology, Parse and nursing science. <i>Hoitotiede</i> [<i>Nursing Science</i>] 8 (3), 158–161
Ollikainen, Marketta 1996. From the editor. <i>Skeptikko</i> [<i>Sceptic</i>] 3/96, 7
Unknown author 1996. Humbug Award 1996. <i>Skeptikko</i> [<i>Sceptic</i>] 4/96, 10–11
Unknown author 1996. Publisher Kirjayhtymä answers: the patient is more important than the Association of Sceptics’ peace of mind. <i>Skeptikko</i> [<i>Sceptic</i>] 4/96
Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. <i>Skeptikko</i> [<i>Sceptic</i>] 4/96, 12–15
Saano, Veijo and Puustinen, Raimo 1997. Humbug-awarded nursing teaching from the United States. <i>Skeptikko</i> [<i>Sceptic</i>] 1/97, 30–35
Paunonen, Marita 1996. Various thoughts about change! <i>Epione</i> [<i>Nursing science student bulletin</i>] 2/96
Paunonen, Marita, Åstedt-Kurki, Päivi and Nieminen Heli 1996. Humbug also flourishes in healthcare. <i>Aamulehti</i> [<i>Morning News</i>] 21.12.1996, 4
Rautajoki, Anja 1996. Therapeutic touch is no humbug. <i>Aamulehti</i> [<i>Morning News</i>], 28.12.1996, 4
Virtanen, Mika 1997. The views of nursing scholars provoke astonishment. <i>Aamulehti</i> [<i>Morning News</i>], 2.1.1997
Ollikainen, Marketta 1996. Spiritual healing for nurses? <i>Yliopisto</i> [<i>University</i>] 20/96, 38–39
Rautajoki, Anja 1997. Does nursing science scuttle its own teachings? <i>Yliopisto</i> [<i>University</i>] 2/97, 29–30
Venäläinen, Riikka 1997. Theories are being argued over at the department of nursing science.

Is the student's legal protection in danger? *Aviisi* [*Student journal*] 3/97, 12.2.1997, 9
Saano, Veijo and Puustinen, Raimo 1997. Belief medication – the new direction for nursing?
The example of therapeutic touch. *Suomen lääkärilehti* [*Finnish Medical Journal*] 18–19, 2306
Paunonen, Marita 1997. Science versus pseudoscience as a basis for nursing and its teaching.
Hoitotiede [*Nursing Science*] 9 (1/1997), 46–47
Kalkas, Hertta 1997. Ethical dilemma column 'What are the ethics of research and teaching in
nursing science like?' Question by Perplexed Bystander. *Sairaanhoitaja* [*Nurse*] 70 (2), 32,
21.2.1997

*Research material obtained from the archive of the University of
Tampere's medical faculty

**Research material attached to the Masters thesis

My analysis of the fasting conflict covers the whole PhD thesis examination procedure, which started in 1995. The procedure included the preliminary examination before the publication of the thesis. The conflict involved three external examiners, who were required to have no connection with the research before the examination. Then the public defence was held. In Finland these are public events which lay people are also expected to attend. During the public defence, the doctoral candidate defends her thesis in front of an audience. There is at least one opponent, who poses questions and makes critiques of the thesis. For the thesis on fasting there were two opponents. After the public defence, the opponents give a statement which classifies the thesis as not accepted, accepted, or accepted with distinction. (In some faculties the theses are graded in more detail, but this was the practice of the medical faculty at the University of Tampere at the time.) After this, the doctoral degree is awarded to the candidate. There might be some further discussion about the PhD thesis in some newspapers, but often the discussion will be limited to an interview with the candidate or reviews of the thesis.

For the conflict over therapeutic touch, the analysis covers the evaluation of the Masters thesis, which was completed in 1993. It then scrutinises the discussion that followed the thesis's publication as a book in 1996. The publisher of the book received the annual Humbug Award from the Finnish Association of Sceptics. The analysis covers the decision to ban the use of certain books in the department of nursing science, as well as the justifications given for the Humbug Award and the discussion of the book's theoretical underpinnings in newspapers, scientific journals, student journals and professional journals. Both conflicts occurred across a variety of forums, but in the conflict over therapeutic touch there were more forums of discussion.

The forums of the discussion material are specified in table 2. The timespan analysed, presented in the table, meant that I sought research material across that timespan.

Table 2. The discussion material and the forums of publication

Forum and timespan analysed	Description
Newspapers	
National newspaper, 11.12.-19.12.1996 and archival search	<i>Helsingin Sanomat [Helsinki News]</i> , Finland's biggest newspaper covering national affairs
Regional newspaper, 16.3.-30.3.1996, 16.12.1996-15.2.1997 and archival search	<i>Aamulehti [Morning News]</i> , a newspaper in the Tampere region within the sphere of influence of the University of Tampere
Newscast	
Evening news, 23.3.1996	<i>YLE News</i> , Finland's main television news broadcaster
Professional and scientific journals	
Scientific journal of nursing science, 1989–2012	<i>Hoitotiede [Nursing Science]</i> , the main peer-review journal of nursing science in Finland published by the Finnish Association of Nursing Research
Professional journal of medical doctors, 1996–1997	<i>Suomen lääkärilehti [Finnish Medical Journal]</i> , the main professional journal for medical doctors in Finland published by the Finnish Medical Association
Professional journal of nurses, 1995–1997	<i>Sairaanhoitaja [Nurse]</i> , the main journal for nurses in Finland published by the Finnish Nurses Association
Other journals and magazines	
Popular health magazine, 1996-1997	<i>Hyvä Terveys [Good Health]</i> , a popular health magazine for the general public
Journal of the scepticism movement, 1995–1997	<i>Skeptikko [Sceptic]</i> , the journal of the Finnish Association of Sceptics
Student bulletin, 1996-1998	<i>Epione [Nursing science student bulletin]</i> , journal for students of nursing science at the University of Tampere
University student journal, 1/1996-5/1997	<i>Aviisi [Student journal]</i> , a student journal from the University of Tampere students' union
University bulletin, 20/96-2/97	<i>Yliopisto [University]</i> , a bulletin of the University of Helsinki, the largest university in Finland

All the research material was in written form; the newscast was transcribed, and the transcript was then analysed. All of the research material exists independently, with no involvement by the researcher. The documentary material was all produced as part of the official procedures of the PhD and Masters theses (for example, the statement by the opponents), and the discussion material was produced during the conflicts themselves (for example, an article in a professional journal to represent views regarding therapeutic touch). Most of the discussion material belongs intrinsically to the conflicts in question, and thus it reflects the decisions made in the documentary material. The documentary material is very concise, and for the most part the documents remain focused on specific issues, such as analysing the work under evaluation. By contrast, the discussion material is broader and encompasses many issues surrounding the conflicts.

The excerpts presented in the analysis give examples of the argumentation in relation to each dimension of boundary-work. They are not the only places in the research material where such argumentation occurred, but they have been selected to illustrate the dimensions of boundary-work in their clearest and most representative forms. This is why some of the research material is not presented in the analytical chapters at all. For example, in the conflict over fasting, the statements by the doctoral candidate are not presented, because they merely repeat the same type of argumentation that occurs more clearly in other excerpts.

The theses in question were read, but they have not been analysed as such, because the research questions were directed to the discussion around them, not to that within them. I was interested in the aftermath of the theses, and thus the analysis focused on the discussions that took place after the theses had been produced. The theses concentrated on finding evidence and justifying the treatments of fasting and therapeutic touch. Reading the theses, however, was essential in order to understand the discussions about them.

Background material

The background material was collected by making connections with the research material and the broader context. The discovery of one item led to another. The rhetorical tools in the research material were

analysed, after which the background material was used to contextualise the argumentation in the research material. The background material acted as a tool for the analysis of the broader context of the research material. It helped me to identify the most important actors and the main audiences in the conflicts, which was important for understanding the background interests at stake in the texts under study. The background material was essential for identifying and locating the arenas of the conflicts. It also helped me to recognise the different levels of language and the variety of forms of expression. The background material consists of:

- 1) official documents;
- 2) PhD theses in nursing science;
- 3) relevant journals;
- 4) nursing science textbooks;
- 4) background interviews;
- 5) personal insider experiences.

Official documents (reports from ministries, curriculums, and committee deliberations and university archives regarding nursing science departments) aid the understanding of the development of nursing science and the arguments that were initially used to establish the demand for a university education for professional nurse administrators and nurse educators. The official documents helped me to piece together the varieties of boundary-work and the qualities and characteristics of nursing science.

PhD theses in nursing science give a background regarding the ways in which research is done, the most common research questions, and the development of research in nursing science. This background material covers PhD theses from the first 20 years of nursing science in Finland, starting with the first thesis in 1984, and comprising 183 theses in total. For the purposes of comparison and in order to gain a good overview of the usual thesis procedure, I also read through the statements of opponents in three departments, at the universities of Turku, Tampere and Kuopio. I conducted an overview of theses in two universities, Tampere and Kuopio, in which I analysed the theoretical starting points, research objectives, research questions, data collection methods, the concepts used and the relationship between research and nursing practice in the theses. This analysis was limited to the years 1984–2004. The University of Kuopio was selected as a comparison university because it has the oldest department of nursing

science, and therefore the analysis could cover the first theses in the field. Altogether the analysis covered 80 PhD theses. In addition to this, I conducted a brief analysis of the theses in three other universities with nursing science departments at that time, by using the thesis abstracts. I also paid close attention to theses which focused on alternative treatments, and to theses produced at the time of the conflicts. This background material broadened my understanding about the most common research themes, ways of doing research and research traditions in nursing science.

Through this analysis I acquired a broad understanding of research in nursing science from the point of view of PhD theses. A limitation of the analysis is that it does not cover research conducted at more senior levels (by postdoctoral and senior researchers). However, as nursing science has been part of the academic community for only 30 years, PhD theses represent the majority of the research that had been done by the time of the conflicts in the mid-1990s. Furthermore, I sought to cover research conducted by senior researchers by collecting the third type of background material. This was an overview of Finland's most important journal of nursing science, *Nursing Science*, from the launch of the journal in 1989 until the present day. I particularly focused on methodological and discussion articles in order to identify the main theoretical-methodological discussions in nursing science and the trends in research and scientific discussion, and also in order to be able to recognise marginalised themes and discussions. The latter issue was of central importance if I was to locate the conflicts over fasting and therapeutic touch, and to understand their position in the field.

The analysis of the academic journal *Nursing Science* was complemented by a complete overview of the professional journal of nursing, *Nurse*. This was ongoing throughout the research process. This point of contact with the professional sphere was essential for understanding how nursing science is presented in professional journals and the status it holds in professional discussions. This helped me to identify linkages between nursing science and professional nursing. This understanding also enabled me to locate the discussion of the conflicts over fasting and therapeutic touch on the terrain of practical nursing and its culture of discussion.

Nursing science textbooks that were on the curriculum at the University of Tampere in the 1990s were used to enhance my awareness of how research objectives and traditions were articulated

to nursing science students as they were being socialised into the field. Special attention was given to textbooks that were banned during the conflict over therapeutic touch. I have followed new course materials that have been published during the process of my research, and in particular I have observed whether the themes involved in the conflicts reappear in any way in the textbooks. Furthermore, I have broadened my perception of how the norms of nursing science and its relationship to society are interpreted in textbooks that are designed to give clear, simplified views of these issues, so as to gain a point of contrast with the argumentation used in the conflicts.

I conducted four background interviews. One was with a person who is knowledgeable about the history of nursing education and the process of the scientification of nursing in Finland. This interview helped me to find relevant official documents to be used as background material in my study. One interview was conducted in order to enhance my understanding of the research tradition at the University of Kuopio: I needed a comparative perspective, since both the research material and my own experiences were focused on nursing science at the University of Tampere. Two interviews were conducted in order to enhance my understanding of the conflicts: the interview themes covered the sequence of events, the most important actors, the position of the interviewee in the conflict, and the conflicts' consequences for present-day nursing science. In addition to this, I made electronic mail enquiries with a person responsible for the practicalities of doctoral theses in the University of Tampere's department of nursing science. This was helpful, since I also received background information on the conflict over fasting.

Moreover, I was able to use my personal experience as background material for the study (see Juhila 1999, 212–213). I studied nursing science during the years 1999–2004. My Masters thesis (Vuolanto 2004) covered the discussion and methodological articles in the journal *Hoitotiede* [*Nursing Science*], which meant that I had already collected a great deal of relevant background material for this thesis, and in particular that I had gained knowledge regarding the development and status of nursing science. I was not yet studying at the time when the conflicts took place during 1995–1997. At some points during my studies the conflicts came up in groupwork sessions. The discussion was not lively; rather it was silenced, and the conflicts were only mentioned if they were brought up from the students' side in the form of questions. As a student one gained the general

impression that the conflicts had been resolved, were no longer active and had almost been forgotten. During my doctoral studies I have been located outside nursing science. During 2004–2008 I was a doctoral student in the University of Tampere's department of public health, and from 2009 onwards I was a doctoral student in sociology in the same university's department of social sciences. Since completing my Masters studies in 2004, I have worked in a research group focusing on social studies of knowledge, science, technology and innovation at the University of Tampere.

I do benefit from having insider knowledge of the field of nursing science that could be called ethnographic knowledge (see Jokinen 1999a, 41-43). I have used this as background knowledge in my analysis of the research material, and for finding relevant background material. It is perhaps also an advantage that I did not happen to get involved in the conflicts. I have neither researched nor taught in the field of nursing science, which would have given a more insider perspective than a student can gain during studies alone. Having been a student of nursing science before my doctoral studies thus places me in a position of advantage that otherwise would have been hard to attain.

My personal experience also added to my personal knowledge of the key actors, which might be considered a good thing, although it might also be seen as hampering my neutrality. The question of the researcher's neutrality has been widely debated in studies of boundary-work.²⁰ Methodological choices are seen as intrinsically influencing the ways in which the research is positioned and the social location of the

²⁰ For the discussions in the 1970s and the 1980s, see Spiegel-Rösing (1977, 23), Collins (1981a and b) and other articles in the special issue of *Social Studies of Science* entitled *Knowledge and Controversy: Studies of Modern Natural Science* from February 1981 (Gieryn 1982a, Mulkay and Gilbert 1982, Gieryn 1982b). Gilbert and Mulkay point out the need for social studies of science to take up a neutral position in relation to who has written the text and what he or she intended the text to mean. Their research is not targeted at the question of what science really is, but rather at how science can be interpreted in many ways, and how it can be given many meanings (Mulkay, Potter and Yearley 1983, 196, Gilbert and Mulkay 1984, 13–14, Potter 1996, 98, 114, 123). The discussion at the beginning of 1990s was initiated by Scott, Richards and Martin (1990) and continued by Collins (1991) and Martin, Richards and Scott (1991). In the mid-1990s the discussion was expanded by Martin and Richards (1995), Ashmore (1996), Richards (1996) and Jasanoff (1996). Brante (1993, 187) also mentions this topic. In more recent discussions, reflexivity is extended to cover the public role of science studies and researchers on science as public actors, for example in legal or political forums (see Stevens 2008, Lynch and Cole 2005, Woodhouse, Hess, Breyman and Martin 2002). The issue of the position of sociologists of science as either critiquing or supporting the position of science in society is discussed in Ceccarelli (2011, 199) and Condit (1996, 87).

analyst is formed (Martin et al. 1991, 253, Richards 1996, 338). One solution for attaining a neutral position in boundary-work research is to accept that the reception of the results of the analysis is outside the control of the social scientist. Even though the researcher aims for neutrality, other actors may take her voice and use it for purposes that she could not have predicted (Richards 1996, 342, Ashmore 1996, 309). This is not to devalue the importance of the researcher's positioning, but rather means accepting uncertainty and including reflexivity in research (Jasanoff 1996, 413). This is clearly expressed by Jasanoff (1996, 409):

We cannot simply be guided by the instrumental uses to which others may put our work, for what we represent is not merely a "side" in a controversy but an entire worldview: one that is deeply committed to seeing science as a dynamic and integral part of society – a social construct – and to probing its distinctive characteristics with all of the theoretical and methodological resources at our disposal.

I accept that neutrality cannot be achieved in types of research such as this thesis, which analyses two conflicts from nursing science's immediate past. As stressed by Richards (1996, 349), this kind of research opens up such conflicts to critical scrutiny and creates possibilities for various interpretations to arise regarding the reasons for the conflict, the goals and interests that lay behind each text, how the conflict was resolved, the acts and means through which the arguments of certain actors were made to seem scientific or otherwise, and the correctness or incorrectness of particular actors. One reason for such multiple interpretations is that in doing boundary-work research, I in turn am also doing boundary-work, mapping out distinctions, categorisations – and boundaries.

In order to enhance the neutrality of the study, I have focused on argumentation produced in the conflicts by all actors, with the specific aim of incorporating marginalised and disempowered voices, which are included in the analysis on an equal footing with more powerful voices (Taylor 1996, 15, Richards 1996, 347). My analysis focuses on the rhetoric of boundary-work, and individual actors, with their goals, ambitions, interests and intentions, are placed in the background. A comparative example from Ceccarelli (2001) may clarify this point. Ceccarelli's study is entitled *Shaping Science with Rhetoric: the Cases of Dobzhansky, Schrödinger and Wilson*. The aim of Ceccarelli's research is to shed light on how certain books gained their influence (Ceccarelli

2001, 4). The close textual analysis, combined with a study of the books' reception, clearly reveals the role of individual actors in promoting interdisciplinary research, and simultaneously highlights their personal intentions and motivations (Ceccarelli 2001, 6–9). An example could also be taken from the boundary-work study by Gieryn (1999, 23), or from other studies where the tendency to highlight the research subjects' intentions and motivations – in Gieryn's terms, their goals and interests – is expressed in a similar vein.

In my study the conflicts are referred to as the conflict over fasting and the conflict over therapeutic touch, because the role of individual actors in the conflict is not central to the analysis. Mellor (2003, 519) argues that research must 'move away from questions about authorial intentions, and look instead at the texts themselves and the contexts in which those texts are placed'. Authorial intentions are not discussed in my analysis, which concentrates on constructions and characterisations that can be interpreted from the texts, and on the limitations to the information the texts provide. In my research the actors are referred to as representatives of certain disciplines or positions, not as authors with intentions (see Potter 1996, 104–105, Jokinen 1999b, 131). For example, a professor of nursing science is considered as a representative of this field, and professorship is considered a powerful position which entails the right to define the discipline as compared to, for example, the positions of a student of nursing science or a practising nurse on a hospital ward. The details of this kind of reasoning are explicated as carefully as possible in the sub-chapters, and this allows the reader to make his or her own interpretations, and to possibly disagree with mine.

4. The conflict over fasting

Introduction to the conflict over fasting

The conflict over fasting appeared during a PhD procedure at the University of Tampere's department of nursing science. A thesis on fasting was accepted in March 1996. The thesis procedure had started several years earlier, when the candidate was seeking a place to complete her doctoral studies and was accepted into the department of nursing science.

At the preliminary examination the candidate did not receive straightforward approval; on the contrary, the first examiner, who came from nursing science, refused to grant permission for publication, which is necessary before the thesis can proceed to the public defence. After the refusal by the first preliminary examiner, new examiners were selected from medicine. The second and third examiner accepted the work and recommended that permission for publication be given to the thesis; a normal public defence was therefore organised. The public defence reached an attendance record, with more than 300 people listening to the event. During the defence, the two opponents of the thesis expressed their doubts about the research. After the public defence, the opponents gave a statement, which ended like this:

The supervision and preliminary examination of the thesis meet the official requirements. In light of the knowledge acquired, the University of Tampere's medical faculty has given the thesis permission for publication. Regardless of this, we take Frankberg-Lakkala's thesis with a pinch of salt. Taking into account the merits already mentioned and the successful conduct of the public defence, we have decided, with great hesitation, to recommend that the work be accepted as a thesis for the degree of Doctor of Health Sciences. (Statement by the opponents Katie Eriksson and Mikael Fogelholm 22.3.1996)

In contrast with this ambivalent reception of the thesis, during the evening following the public defence the main news programme on Finland's leading television channel announced that fasting had been

scientifically proven to be healthy. The doctoral candidate was interviewed, and fasting was presented in a positive light, both as a thesis research topic and as a treatment. These news headlines provoked one of the opponents into writing an article for the medical profession's leading journal, and also for a popular health magazine, presenting his opposing view, outlining the poor quality of the thesis and the unscientific character of the research. The debate continued: the doctoral candidate presented her views in response to the opponent in the same forums, and also commented on the opponents' statement to the faculty of medicine. The conflict had ended by the summer of 1996, as the discussion faded after a few texts in journals.

The PhD thesis in question was the fifth at the University of Tampere's department of nursing science. My analysis of nursing science PhD theses in Finland shows that before this PhD thesis, 28 theses had already been completed in nursing science at five universities. Thus there had already emerged a culture of PhD theses. During the procedures of the very first PhD theses it was customary to find supervisors, examiners and opponents from disciplines other than nursing science, such as medicine, educational science, public health or history (to judge from my analysis of two departments of nursing science, at the universities of Kuopio and Tampere). However, as the number of PhDs in the field grew, it became increasingly common to use supervisors, examiners and opponents from nursing science only. At the time of the PhD on fasting, it was not uncommon for the group of actors to include actors from other fields. However, it was common for at least one actor in the group to be from nursing science. Usually the actor from nursing science was the supervisor, who might share the role with a supervisor from some other discipline. Usually there was only one opponent: with the very first theses the opponent might come from another discipline, but very soon it became customary to select opponents from nursing science.

In the case of the thesis on fasting, the supervisors were from health education and psychology, not from nursing science. The first examiner was from nursing science, but she did not recommend that permission for publication be given to the thesis. Her statement was immediately followed by a statement of response from the doctoral candidate, defending her thesis. This is not a routine practice in examination procedures; indeed, it was very unusual, and it can also be interpreted as an attempt to intrude upon the examination process.

Permission for publication is a prerequisite for a thesis to move on to the next step in the procedure. It is the task of the examiner to evaluate the general nature of the thesis, the proportion of independent work by the doctoral candidate in the research process, the scientific value of the research, the quality of the research data, the reliability of the methods and results, the maturity of the discussion, and the writing style and presentation of the thesis (Tampereen yliopisto 2012). The examiner then indicates in the statement whether permission for publication can be given to the thesis. The change of examiners led to another unusual situation. Usually the examiners work alone, but in this case the third examiner was able to read the first and second examiners' statements, and to draw on them while formulating his own statement.

After the first examiner rejected the thesis, two other examiners were chosen, both from medicine and from the subfield of physiology. These examiners recommended that permission for publication be given to the thesis. After the examination of a PhD thesis there immediately follows a public defence, during which opponents ask questions of the doctoral candidate. Exceptionally, for the thesis on fasting two opponents were appointed, one from nursing science and the other from nutrition science. This meant that there was as little involvement as possible from nursing science itself in the thesis on fasting. The examination procedure was lengthier than usual, because the first examiner refused to grant permission for publication. The gender balance at play in the thesis procedure was also unusual for theses in nursing science. Very often the supervisors, examiners and opponents would all be female, but this time the supervisors were male, as were the second and third examiners and one of the opponents.

Another unusual element was the age of the doctoral candidate, who was 63 at the time of the public defence (bulletin in regional newspaper by Seppo Kangasniemi, 23.3.1996). Students of nursing science are usually older than those in other disciplines, but nonetheless it is unusual for a person of such advanced years to defend a thesis in the discipline. The candidate was known as a teacher of nursing in an educational institution, and also for her activities in the sphere of alternative treatments as a teacher of fasting.

The repercussions of the public defence were unusually strong for a nursing science thesis. Only a small proportion of theses receive publicity beyond the usual routine announcement in the university

bulletin. It is only very seldom that a thesis gets onto the evening news on the main television channel. The thesis on fasting received publicity in the television news, and afterwards in the *Finnish Medical Journal* and the journal *Good Health*. The doctoral candidate was publicly very active, giving interviews to newspapers and on television. The opponent from nutrition science also participated in the discussion. Nursing scholars did not react to the discussion. The aftermath also included critiques from the Finnish scepticism movement.

The next four subchapters present the analysis of the forms of boundary-work in the conflict over fasting. Each subchapter ends with a summarising section in which the qualities given to nursing science through boundary-work are presented. After these four subchapters there is another subchapter in which the forms of boundary-work are summarised. Reading through the analysis gives a deep understanding of how the forms of boundary-work were rhetorically created, and how the qualities of nursing science were produced through rhetorical means.

Intradisciplinary boundary-work

The aim of this subchapter is to present the analysis of intradisciplinary boundary-work in the conflict over fasting. The intradisciplinary boundary-work was found to take four forms: norms of literature use, the principles of experimentation as a startingpoint of evaluation, the contrast between objective and subjective knowledge forms, and identity-work in nursing science. These forms are illustrated through the analysis of excerpts from the first examination statement, the response statement by the doctoral candidate, the opponents' joint statement, the opponent's article, and the articles by the doctoral candidate against the opponent and the *Sceptic* article.

Norms of literature use

One form of intradisciplinary boundary-work was found to consist in formulating the norms of literature use. This type of boundary-work was found in the first examination statement by a senior academic in nursing science, in the response statement by the doctoral candidate,

and in the joint statement by the two opponents, one of whom was from nutrition science and the other from nursing science. The first examination statement notes:

The researcher could have been more critical in her choice of literature, because some of the works do not fulfil scientific criteria (e.g. textbooks, theses from professional training institutions, unscientific journals). Some of the literature used is also 'outdated', so the latest information has not been sought in all parts (e.g. as regards health education, page 25). (First preliminary examination statement by Arja Liukkonen, 26.6.1995)

This excerpt is taken from the part of the examination statement that analyses the structure and methods of the PhD thesis, addressing the choice of literature. With the expression 'more critical' the excerpt implies that the basic rules of research have been broken, because the thesis has violated the rule of criticalness. The modal verb 'could have been' creates an expectation of criticalness in theses, and also in research more generally. It indicates that criticalness would be a marker of scientific work, but that the thesis has failed to achieve it for two specific reasons: the references do not meet the standards of research, and some of the sources are outdated.

The statement notes that some of the references used in the thesis do not 'fulfil scientific criteria', which labels them unscientific. The abbreviation 'e.g.' before the list of literature presents some literature as unscientific, which gives the impression that there is a broad group of unscientific work in the known literature that might be used by mistake as references for scientific research. The first statement indicates that there is also other literature that cannot be considered scientific, but it is not listed here. This limiting of the listing to some types of literature points to these specific sources as sources that are important to remember. It gives the impression that these types of literature are easily recognised. It also implies that the many different forms of unscientific literature cannot be presented in the statement due to lack of space, and therefore only the most important and significant markers are pointed out. The list of three items assures the reader that these types of source represent a generally accepted, normal way of identifying unscientific sources within the scientific community.

The sentence containing the list of three types of literature that do not meet scientific criteria categorises the literature into 1) works that fulfil scientific criteria and 2) those that do not fulfil these criteria. The

first category does not need to be specified; instead, literature of this type is assumed to be commonly understood. The second category underlines the need to specify the unscientific sources. This category includes three sources of information that are explicitly described as not meeting the standards of science: textbooks, theses from professional training institutions, and unscientific journals. The second category is formed in order to illustrate the unscientific nature of the literature used and to point out the thesis's lack of criticalness. The principle of criticalness would have prevented the use of literature that does not fulfil scientific criteria, and would instead have fostered the use of scientific literature commonly accepted in the scientific community. Thus the categorisation made in the first examination statement demonstrates the uncritical and unscientific nature of the thesis.

The literature labelled here as unscientific may be related to the context of nursing education. The textbooks commonly used in nursing education were labelled as texts that do not meet scientific criteria. An example of a textbook much used by the doctoral candidate in the thesis was Nienstedt, Hänninen, Arstila and Björkqvist's 1989 publication *Human Physiology and Anatomy (Ihmisen fysiologia ja anatomia)*. This book is typical of the textbooks used in nursing education: it was written by experienced and respected medical scientists and published by the Finnish Foundation for Nursing Education. The norm is based on the perception that textbooks synthesise newer and older knowledge rather than producing new knowledge, and as such they are by definition not independent scientific products. A Finnish study on publishing practices found that textbooks in the field of medicine do not present original results from trials or research projects; instead they offer broad reviews of a complex theme. Thus they are not considered original publications in the field of medicine (Puuska and Miettinen 2008, 31, 55). The norm of not using textbooks as scientific research literature, presented by the representative of nursing science, may relate to this perception in medicine.

The norm of excluding theses from professional training institutions may relate to the model of education in Finland. Nursing auxiliaries are educated in vocational training institutions, and the professional education of nurses is organised at lower-level institutions called polytechnics. From the mid-1990s onwards these polytechnics were considered higher-education institutions, and were also referred

to as universities of applied sciences. Academic nursing education is organised in universities, in nursing science curriculums. Theses from healthcare training institutions refer in particular to the professional nursing training organised in polytechnics, about 25 of which provided healthcare training at the time of the thesis procedure (figures from 1.8.1998 in Perälä and Ponkala 1999, 23). Theses in professional nursing training are conducted as final projects before the nurse's certification, and these final projects often have strong connections with working life and are expected to be applicable in everyday nursing practice.

An evaluation by the Finnish Higher Education Evaluation Council carried out soon after the thesis procedure analysed the division of labour between theses in polytechnics and those in universities. The evaluation concluded that the division of labour between these two institutions in the healthcare education sector is not clear-cut, and that to date theses in polytechnics have been similar to Masters-level university theses. However, the evaluation argued that theses in polytechnics were in the process of becoming more practice-oriented than university Masters theses (Perälä and Ponkala 1999, 43–44). In the nursing science context, separating lower-level theses from university-level theses actively constructs a barrier between the categories of applied (polytechnic) and pure (university) research. The norm indicated in the first examination statement, that theses from professional training institutions should not be used in a nursing science PhD thesis, thus distinguishes scientific education from vocational or professional-level education. The norm clarifies the hierarchical power relations between polytechnics and universities. The discursive production of this norm indicates that there has been some difficulty in demarcating polytechnic from university theses in the field of nursing science. Theses from polytechnics are treated as less valuable than university theses, which clarifies the independence of university education and legitimates university nursing science as a separate activity in its own right.

The demarcation of scientific journals from unscientific publications reflects the multitude of publications in the healthcare field in Finland. In the context of nursing there are popular magazines that give information about health matters to the general public and are strictly controlled by healthcare professionals (for example, *Good Health*) or more loosely controlled by official or unofficial healthcare professionals (for example, *Healthy Life*); professional journals (for

example, *Nurse*); semi-scientific journals (for example, *Nursing Evidence*); and scientific journals (for example, *Nursing Science*). In addition to these publications, the daily newspapers very often also publish health-related news. These levels of journal also exist internationally, which makes the variety of journals even broader, and the notion in the statement about unscientific journals indicates the existence of a hierarchy within the multitude of healthcare journals. From the boundary-work perspective, the demonstration of a hierarchy among the journals is an act of expulsion, evidencing the power of nursing science to maintain and create a normative monopoly over its own justified status.

The contrast pair ‘outdated-latest’ in the second sentence of the excerpt emphasises the norm that scientific research seeks up-to-the-minute literature. The adjective ‘outdated’ illustrates that the thesis fails to conform to this norm by using outdated literature, which erodes the credibility of the thesis. The word ‘outdated’ is put in inverted commas, which gives the impression of an ironic connotation that does not exactly mean the word used. The contrast pair ‘outdated-latest’ signifies the negative meaning associated with literature that has been left behind, and contrasts it with modern scientific literature. It presents the latest knowledge in a favourable light, and suggests that outdated literature should be replaced by newer literature.

The use of the word ‘also’ in front of the word ‘outdated’ enforces the observation about the thesis’s failure to meet scientific criteria. The notion of ‘all parts’ of the thesis refers to the incompleteness of the thesis and its lack of success in striving for completeness and comprehensiveness, the ideal characteristics of a PhD thesis. In parentheses the abbreviation ‘e.g.’ creates an impression that these kinds of violation of the rule of using the latest knowledge can easily be found in the thesis. The argument about the preferability of the latest knowledge over outdated knowledge is made easier to accept by the example. According to the excerpt, the thesis should use the newest literature, with no gaps or detours through outdated literature that has long since been left behind by modern scientific research. With the contrast pair ‘outdated-latest’ the excerpt stresses the novelty value of knowledge, and emphasises that perfection in a PhD thesis requires the use of new knowledge. The text also adheres to the belief in the continuous progress of science by contrasting new knowledge with older knowledge.

The response statement by the doctoral candidate discusses the call for scientific and up-to-date knowledge:

‘The researcher could have been more critical in her choice of literature...’ (Liukkonen). I have mentioned in my work that the difficulty is that there has been little research-based knowledge on fasting. For this reason, unscientific publications have also been utilised. The thesis mentioned by Liukkonen was a survey made by my student on the eating habits of fasting persons. It has now been removed, as have textbooks and most pre-Masters-level references. Some ‘outdated’ references have been used, when there is no newer knowledge and the knowledge on the issue in question is usable. The reference mentioned by Liukkonen is Green et al.’s (1980) study. I have not been able to remove this, because my supervisor, Jukka Laitakari, particularly recommended it. This study is regarded as central in health education. (Doctoral candidate response statement by Helena Frankberg-Lakkala 1/14.8.1995)

The excerpt from the response statement starts with a quotation from the first examination statement. The first sentence demonstrates the difficulty of finding research-based knowledge on the thesis topic of fasting. This emphasises the genuine attempt by the doctoral candidate to seek scientific research on the research topic of fasting. The text indicates that the allegedly poor quality of the knowledge used is not a result of the doctoral candidate’s failure to look for the latest knowledge, as the first statement claimed; instead it is due to the lack of knowledge on the subject. As a consequence of this lack of knowledge, the doctoral candidate has been forced to make the conscious decision to use some unscientific publications in her thesis.

It is noteworthy that the word ‘unscientific’ is straightforwardly adopted from the first examiner’s text, and is not criticised as such. The excerpt asserts that the candidate’s own judgment has been used in decisions about the selection of certain source material, despite the latter’s unscientific nature. The excerpt illustrates the candidate’s flexibility to remove certain sources on the basis of the authority of the first examiner, and to retain other sources on the basis of either the candidate’s own judgment or the supervisor’s authority. The response statement stresses that the literature has been consciously selected. Some outdated works have been included in the thesis because of a lack of newer literature, and because the knowledge has been usable. The criteria for the usability of knowledge are not specified. The excerpt implies that the bare ‘usability’ of knowledge justifies the choice of literature.

The excerpt demonstrates the authority of the supervisor over the first examiner. In the response statement, the supervisor's recommendation concerning one book is so strong that it has been impossible to even think of leaving it out, regardless of the preliminary examiner's suggestion. The text implies that the recommendation of the examiner cannot override the authority of the supervisor. The modal verb 'have not been able to' indicates the strong role of the supervisor in defining the sources of the thesis. Moreover, it describes the limits of the candidate's flexibility to be led in the direction the examiner desires. The authority of the supervisor is enforced by the power connected with the supervisor's field of research. The candidate writes that the source includes knowledge that is considered central in the field of health education. Health education is particularly mentioned as a field whose sources need to be incorporated into the thesis if they are considered central. Nursing science is not mentioned as having such power to define the literature in the thesis.

The excerpt from the candidate's statement strikes a balance between the candidate's responsibility to submit to the first examiner and her responsibility to fulfil the expectations of the supervisor. The discussion of the norms of literature use negotiates the candidate's autonomy and independence to decide the sources of the thesis and the principles of literature choice. The principles of literature choice become threefold: the choice can be based on the candidate's judgment, the supervisor's judgment, or direction from a higher quarter, such as the preliminary examiner. The excerpt demonstrates that the choice of literature is a process of careful consideration, and thus it seeks to present the doctoral candidate as critical and evaluative.

The opponents' statement also deals with the norms of literature use:

Counterweighing the undisputable merits of the thesis, there are numerous problems regarding the use of literature, the interpretation of findings and the conclusions: 1) The use of literature is unsystematic, among other things new references are lacking, there are many unscientific references and even unpublished manuscripts are used, the research is quoted directly and is carelessly interpreted, and there are numerous technical mistakes in the references list. (Statement by the opponents, Katie Eriksson and Mikael Fogelholm, 22.3.1996)

The opponents' statement at first hails the merits of the thesis. The first few words generate the sense that the thesis does deserve some credit: its merits cannot be challenged as such. However, the metaphor 'counterweighing' indicates that on the other hand there are numerous aspects of the thesis that, in light of a precise evaluation, demonstrate the deficiencies of the thesis. The metaphor 'counterweighing', connoting a weighing instrument, creates an impression of the exactness of the evaluation, the process measuring the good and bad sides of the thesis. The adjective 'numerous' overstates the deficiencies, making their numerousness a crucial matter, and thus underlines the problems of the thesis. The sentence listing the problems reasserts their numerousness and gives the impression that there are several perspectives from which the realisation of the thesis is problematic. These several perspectives also give the evaluators credibility: they have looked at the thesis from different perspectives and have noted some good aspects, but their criticalness has led them to find numerous problems in the thesis.

The statement presents a numbered list of six types of crucial problems or mistakes in the thesis. The sentence listing the problems includes the use of literature, the interpretation of the results and the conclusions. In this part of the analysis I will focus on the first item, which focuses on the issue of literature use.

The evaluative adjective 'unsystematic' presents an expectation of the systematic use of literature in research, especially in theses, and thus emphasises the importance of being methodical as a criterion for good scientific literature use. The phrase 'among other things' at the beginning of the evaluation of literature use generates the effect that there are numerous problematic aspects of the thesis's literature use, and that those that are mentioned and relatively easily named are just examples of the many ways in which the author's use of literature is problematic. This underlines the impression that similar problems are frequent and habitual. The phrase 'among other things' also raises questions about which aspects were selected for mention and which were not. It also generates the impression that those other aspects were not so clearly to be found, or did not so obviously contribute to the poor credibility of the thesis.

With the evaluative adjective 'new' the excerpt announces the lack of up-to-date knowledge. The use of outdated instead of new literature becomes a serious deficiency of the thesis, and generates an impression of lagging behind and remaining in the past instead of in

the newest discussions in the scientific field. The word ‘unscientific’ in front of the literature references is peremptory and makes an extreme expression as it draws attention to the unscientific nature of the references. In a thesis evaluation procedure, stating that something is unscientific marks the issue in question very strongly. It emphasises the unscientific aspects of the thesis. The absence of scientificity is easily connected with promotion of the unscientific, and the person responsible for the absence is readily presented as a proponent of unscientific instead of scientific ideas. Therefore the expression ‘unscientific’ in connection with the thesis’s references produces an impression of the unscientific nature of the thesis.

The use of the adjective ‘unpublished’ relates to the requirement that research results be published and reviewed by the scientific community. Publishing in general ensures that the text has been read and evaluated by persons other than the author, and in relation to scientific publishing it guarantees that the text is evaluated and approved by the scientific community. The excerpt implies that there are piles of unpublished manuscripts that have not gone through any process of approval by the scientific audience, and thus that their use is an act of poor judgement and a marker of a connection with an unscientific community rather than the scientific one. The use of unpublished manuscripts becomes an error that violates the scientific community’s practices of the evaluation and review of research results. The word ‘even’ is a connecting word between the many unscientific references and the unpublished manuscripts. This connection makes the unpublished manuscripts an extreme case of unscientific references, and this further accentuates the violation of the rule that a thesis should use scientific references, thereby making it more crucial.

The fourth aspect listed in the opponents’ statement concerns the style of writing and the use of previous literature in constructing the thesis. The verb ‘quoted directly’ indicates that lifting quotations from previous literature is not regarded as sufficient in a scientific thesis. The requirement instead would be to deeply analyse the previous literature, and the thesis’s mistake becomes its lacks of analysis. It merely quotes from previous research, which makes its use of literature inadequate for a PhD thesis. This notion relates to the principle of analysis and synthesis in research: in analysis the topic of the research is broken down into small pieces, and in synthesis those pieces are brought together in a novel way. ‘Quoted directly’ conveys the meaning that the analysis of the literature has not been done, and

that therefore there cannot be any synthesis of the literature either. This fourth aspect bears along with it the expectation of deep analysis and synthesis, and quoting directly becomes a violation of the norm of the analytical and synthetic style of research.

The fifth aspect concerning the use of literature includes the interpretation of previous literature. The evaluative adverb 'carelessly' reveals the expectation that the interpretation should be careful and meticulous. The thesis has failed to meet the expectation of the meticulous interpretation of previous research. Instead it has conducted the interpretation carelessly. The carelessness also carries with it the possibility of making mistakes in the interpretation, or of the interpretation not having been done according to the usual scientific standards. The latter of these two possibilities produces the exceptionality of the thesis, as it does not follow the usual rules of research methodology. Carelessness with the interpretation of previous literature therefore becomes a violation of the methodological rules of good scientific practice.

The last aspect presented in the list of problems with literature use is the technical mistakes in the list of references. In the statement, technical correctness becomes a quality that is expected of a list of references in a scientific thesis. The thesis's author is accused of not reaching the level of technical correctness expected of a thesis. In the list of problems, technical mistakes give the impression that the thesis is of poor quality. The frequency of the technical mistakes is emphasised by the adjective 'numerous', which produces the impression that breaking the rule of correctness is a prevailing practice in the thesis, a careless kind of mistake. The numerousness of these final kinds of violation is further emphasised, as 'numerousness' has already been used earlier in the text. The words 'numerous' and 'numerousness' use the rhetorical device of quantifying the issue. The repetition of 'numerous(ness)' binds the arguments together and creates an impression of the ubiquity of these types of mistake. This constructs a general impression that the thesis is full of mistakes in literature use.

It is characteristic of this form of intradisciplinary boundary-work to explicate the textual norms of scientific research, and to identify the textual requirements of the scientific practice of writing up research. By presenting the norms of literature use, the statements by the opponents and the first examiner make visible the identification marks of scientific research. The power of the thesis evaluation procedure is

used to ratify the norms concerning literature use. The excerpts highlight the evaluation procedure as a quality assurance activity, and the role of the evaluators and opponents as protectors of good scientific practice. The textual norms presented are in parallel with the general rules of writing up research, and thus are not necessarily specific to nursing science alone.

The principles of experimentation as a starting point of evaluation

Another form of intradisciplinary boundary-work sets out the criteria for good research by using the criterion of experimentation. This form appears in the opponents' statement. As mentioned in the previous subchapter, the opponents' statement gives a numbered list of six mistakes and problems in the thesis. The principle of experimentation becomes particularly active in problems number two and three, which will be placed under scrutiny in this subchapter. Number two in the list of problems states:

2) The possible effects of the fasting course may be due to physiological reactions to fasting, health education during the course of fasting, psychological and physical stress regarding rejection, or the simultaneous effects of all of these. These problems have not been deeply analysed. (Statement by the opponents, Katie Eriksson and Mikael Fogelholm, 22.3.1996)

The evaluative adjective 'possible' questions the effects of the fasting course that were described in the thesis. The modal verb 'may be due' expresses conditionally that there might have been many causes of the alleged effects of fasting. The verb also implies that those effects may have occurred because of fasting alongside other factors. After this the excerpt raises four possible causes of the alleged effects of the fasting course: physiological reactions to fasting, health education during the course of fasting, mental stress due to rejection and physical stress due to rejection. Finally, the statement claims that these causes might occur in different combinations. The last suggestion about combinations erodes the claims of the thesis, and makes it clear that the research setting allows many possible causes. As the effects themselves are presented as speculative, the excerpt gives the impression that the evidence in the thesis cannot be trusted. The

excerpt thus implies that the search for cause and effect in the fasting course has not been carried out correctly or in a credible way.

Through the negation ‘not been deeply analysed’, the last sentence indicates that these problems in the search for cause and effect in the fasting course should have been discussed more thoroughly. The use of the adverb ‘deeply’ indicates that a deep analysis of the problems would have been desirable and appropriate. Instead, the opposite of deep analysis happened, and the problems were discussed in a shallow way. Indeed, the impression is given that these problems were not discussed at all. Item number two carries connotations of the classic experimental arrangement, which aims to find the most effective cure for some phenomenon. The opponents’ statement thus views the thesis from the perspective of experimentation, and the comments on the efficacy of the fasting course relate to this tradition.

The third shortcoming of the thesis is presented as follows:

3) The participants in the test and control groups were not randomised into separate groups. However, before the test the persons in the test group were more interested in their health and lifestyle, and they took a positive view of fasting. Many had the objective of losing weight. In particular, the male persons in the test group were fatter than persons in the control group, and they were given weight-watching instructions after fasting. For these reasons, it is difficult to distinguish the actual independent effects of the fasting course on the factors of mood, weight, blood pressure and health behaviour. The doctoral candidate brings up the differences between the groups at the beginning of the discussion section, but she does not consider these sufficiently when interpreting the findings. (Statement by the opponents, Katie Eriksson and Mikael Fogelholm, 22.3.1996)

The third shortcoming starts with a categorisation, dividing the persons involved in the thesis research into test group participants and control group participants. These categories indicate the existence of an experimental research setting. The negation ‘were not randomised’ presents the notion that the practice of randomisation was expected to be applied in this type of research. The requirement of randomisation means that the persons to be tested are divided into groups in a way that is neither deliberately decided in advance nor chosen by either the researcher or the participants themselves. In other words, the persons to be tested are placed into groups (FSD 2012). In the case of the fasting course, randomisation would have meant that the test and control groups were constructed randomly and the participants

themselves could not have decided whether to fast or not. The practice of randomisation is connected with the norms of clinical research in medicine, for example in the clinical testing of medications. Thus the call for randomisation connects the opponents' evaluation of the research with clinical research criteria.

The second sentence, starting with the adverb 'however', reveals the possibility that participants were deliberately chosen for the test group who were more interested in their health and lifestyles, wished to lose weight, and were fatter than those in the control group. Furthermore, they were given slimming advice after the course, while the others were not. The text indicates that if correct randomisation had been practised, there would not be such obvious differences between the two groups of participants. The text assumes that as a requirement for research, randomisation would have guaranteed that the participants would be divided into two similar groups, and that after this the possible effects of fasting could have been more clearly distinguished. The adjective 'independent' indicates that the goal of this type of research should be to separate out the effects caused solely by the fasting course from those caused by other factors.

The message of the third shortcoming is that the thesis has failed to construct a research setting that would qualify as suitable for studying the causes and effects of fasting. According to the opponents' statement, the attempt to set out the differences between the two groups at the beginning of the thesis does not suffice to meet the requirements of experimentation. The negation 'not sufficiently' in the last sentence indicates that this was expected to be taken into account in the interpretation of the findings. The expectation was not met, and therefore the thesis fails to fully fulfil the requirements of experimental research design.

The opponents' statement is in line with the rhetoric of the evidence-based treatment guidelines, and is thus related to evidence-based medical practice. The norms and criteria may be related to the Finnish Medical Society Duodecim's procedures for preparing the evidence-based treatment guidelines, which started in Finland in 1994, around the time of the thesis procedure. According to a Finnish study on these guidelines, they insist on systematically compiled research knowledge, assured through the practice of randomisation, which aims to limit the possibility of external factors that might confuse the analysis. The guidelines also emphasise statistical and clinical significance, and the benefits of treatment (Nummenmaa 2007, 13–

14). The guidelines are targeted at medical practitioners in order to reduce variations in patient care and improve the efficacy of healthcare, but they are also connected with the growing concern over healthcare costs and the use of targets in public-sector healthcare (Alanen 2009, 10). The argumentation of the opponents, who represented nursing science and nutrition science, demonstrates the positioning of the emerging field of nursing science within the framework of experimentation.

It is characteristic of this form of intradisciplinary boundary-work to utilise the generally known norms of experimentation. Criteria are taken from experimentation in order to establish the norms of a PhD thesis. Together with the first form of intradisciplinary boundary-work, this form of boundary-work deals with the norms and principles of good research. However, while the first form of intradisciplinary boundary-work formulated general norms familiar to all disciplines, the second form utilises norms and criteria from the point of view of health sciences and, within health sciences, of research that focuses on experiments.

The contrast between objective and subjective knowledge forms

A third form of intradisciplinary boundary-work occurs through the drawing of contrasts between subjective and objective knowledge forms. This is done in both the article by the opponent and the response article by the doctoral candidate. The opponent whose background was in nutrition science clarified the requirements of research in an article published in a professional medical journal. The introduction, the first section and the last section of the article illustrate this type of intradisciplinary boundary-work. The introduction states:

As alternative treatments become more popular, the popularity of fasting has also grown. In a dissertation at the University of Tampere by healthcare licentiate Helena Frankberg-Lakkala, fasting was presented as bringing subjective well-being, improving health as estimated by objective measurements, and beneficially changing health behaviour. The work received great publicity, including on the main news programme. In spite of this, a critical evaluation of the thesis reveals that there was no undisputable evidence for the health effects. (Fogelholm, Mikael 1996.

Does fasting work after all? *Suomen lääkärilehti* [Finnish Medical Journal] 15/1996, 1717, and *Hyvä Terveys* [Good Health] 4/1996, 26–27)

The first sentence connects fasting and the PhD thesis with alternative medicine. The use of the verb ‘presented’ in the second sentence, although apparently quite neutral, bears with it a potential meaning that differs from that of the verbs ‘discover’ or ‘find’, which are often connected with new discoveries in science. Thus the use of the verb ‘present’, later repeated in the text, evokes doubt about the credibility of the thesis.

The introduction also uses the contrast pair ‘subjective-objective’, which is also repeated several times in the response article. This contrast pair constructs a difference between subjective perceptions and objective measurements. ‘Subjective’ refers to a person’s perceptions of her own actions, depending on her experience and her personal estimations, views and ways of thinking, the starting points of which are always biased. ‘Objective’ refers to something that is not dependent on one’s own perceptions or evaluations and that is by nature unbiased, neutral and even-handed. In the excerpt, the adjective ‘subjective’ is used in connection with purely personal perceptions and beliefs, whereas ‘objective’ is used in connection with measurements, knowledge and a genuine, justifiable method of cure. The use of the terms ‘objective’ and ‘subjective’ in the excerpt gives an impression of the superiority of objective over subjective knowledge production.

The introduction then moves on to deal with the publicity surrounding the thesis. The evaluative adjective ‘great’ in front of the noun ‘publicity’ hints that the publicity was exaggerated. The word ‘publicity’ alone, without the adjective, would have been a more neutral expression. The word ‘including’ gives the impression that the publicity surrounding the thesis extended across many media sectors. The main TV news programme becomes an example of the most popular public forum. At the end of this section of the article, the reservation ‘in spite of’ turns the reader’s attention to the weaknesses of the thesis: the thesis does not pass critical evaluation, and the health effects are not based on undisputable evidence.

The adjective ‘critical’ is presented as a description of a desirable element in a thesis, and connotes the principle of criticalness in research in general and the evaluation process in particular. The adjective ‘undisputable’ bears with it an expectation that the effects found should have been undisputable. Instead, the adverb ‘in spite of

implies that the evidence in the thesis can be disputed. Evidence in a scientific context means proofs and accounts that can be presented as certifying the argument, or in this case as certifying that the health effects claimed for fasting are true. The word ‘evidence’ in the context of health research is attached to connotations of the evidence-based medicine and clinical practice guidelines already discussed in the previous subchapter.

The first section of the article states:

Frankberg-Lakkala’s PhD thesis presents the argument that the eating habits (drinking coffee, using salt, eating greasy food) of the persons in the test group was improved and that their smoking had diminished after the fast. Eating habits were estimated by means of qualitative questions (I use a lot, quite a lot, a little, very little or not at all), which, however, were not validated. Thus the research only proved that the test group participants’ own perceptions of their eating habits had changed. Because the evaluation was purely subjective, it could have been affected by a belief in the good effects of fasting. Objective knowledge about changes in eating habits was not gained. (Fogelholm, Mikael 1996. Does fasting work after all? *Suomen lääkärilehti [Finnish Medical Journal]* 15/1996, 1717, and *Hynä Terveys [Good Health]* 4/1996, 26–27)

The verb ‘estimated’ connotes subjective rather than objective knowledge, as does the use of the adjective ‘qualitative’. The second sentence in the paragraph demonstrates the opponent’s expectations about the validation of research measurements. The concept of validation relates to the sensitivity and accuracy of the test for measuring the phenomena it is supposed to measure. Validating the test is a routine action taken to confirm findings in quantitative experimental research. Validation would have confirmed the research findings, but according to the excerpt, as the adverb ‘however’ indicates, this expectation was not fulfilled.

The lack of validation in the excerpt means that the estimations of changes in eating habits were the perceptions of the test group participants themselves and were therefore subjective rather than objective knowledge, even though the thesis claimed that eating habits had improved during fasting. The subjectivity of the knowledge gained about eating habits is connected with beliefs in the good effects of fasting. The excerpt thus connects beliefs with subjective perceptions, and knowledge with objective facts.

The article continues in the last section:

Research on alternative treatments is a good thing, and therefore Helena Frankberg-Lakkala's work should be welcomed. In spite of the flamboyant headlines, the scientific results remained scanty. Even after this thesis, fasting remains more of a 'belief medicine' than a real, objectively justified treatment. (Fogelholm, Mikael 1996. Does fasting work after all? *Suomen lääkärilehti* [*Finnish Medical Journal*] 15/1996, 1717, and *Hyvä Terveys* [*Good Health*] 4/1996, 26–27)

The first sentence gives credit to the thesis as a study of alternative treatments. However, the excerpt immediately turns to its inadequate scientific results. The evaluative adjective 'scanty' refers to the expectation of the adequacy of scientific evidence for the findings. However, the thesis was not as fruitful as had been expected. The verb 'remains' gives the impression that fasting will stay as it is, and it also implies that fasting has already been categorised as 'belief medicine'. This status of fasting has been not changed, not even by the publication of the thesis's results.

The concluding sentence contrasts belief medicine with real, objectively justified care methods, and belief medicine is thus connected with unreal, subjectively argued care methods. The noun 'belief medicine' is placed in inverted commas, suggesting that the exact meaning of the words is not intended; instead it has a secondary meaning, out of the ordinary. The use of belief medicine downplays the phenomenon more heavily than would the use of other terms for the same phenomenon, such as alternative medicine or complementary medicine.

Similar argumentation is used in the response article by the doctoral candidate. In total, the article is comprised of 13 sections, two of which will be placed under close scrutiny here because of their representative argumentation about the distinction between subjective and objective knowledge forms. The doctoral candidate answers the opponent's critique:

'Objective knowledge about changes in eating habits was not gained.' The changes in eating habits were certainly grounded in the research participants' answers. Only the amounts of energy during the fasting week were accurately measured. A researcher must indeed rely on the answers given by the participants. In this study, the results from the fasting participants were related to those from the control group. It cannot be concluded that the fasting participants lied and the control group told the truth. The objective measurement of eating would have required time and resources to an extent that was not possible in this type of research. Each portion of food eaten would have had to be measured

under supervised conditions for four months. By the way, has any nutritionist ever done any research like this? (Frankberg-Lakkala, Helena 1996. Comment on the article “Does fasting work after all?” *Suomen lääkärilehti* [*Finnish Medical Journal*] 20–21/1996, 2175, and *Hyvä Terveys* [*Good Health*] 6/1996, 64)

At the beginning of this first excerpt, the text directly quotes from the opponent’s article. The adverb ‘indeed’ indicates agreement with the opponent’s article about the basis of the research subjects’ answers. The modal verb ‘have to’ expresses the need to trust those answers, and thus establishes an understanding of research that trusts its research subjects. The adverb ‘certainly’ also establishes agreement with the opponent’s article and replicates the principles of this type of research.

After the beginning, the excerpt turns to specifying the choices made during the research, and in particular to confirming the principles that underpin it. The negation ‘it cannot be concluded’ that the fasting participants lied and the control group told the truth attacks the argumentation in the opponent’s article. With this notion the response article describes as impossible the suggestion in the opponent’s text that evidence based on the perceptions of the fasting participants should be rejected. This suggestion is labelled as untrue, and the opponent’s text is accused of presenting a view which holds to the impression that the fasting participants lied and the control group told the truth.

The excerpt then broadly describes how impossible it would have been to measure food consumption objectively. The opponent is positioned as a proponent of such measurement, and the doctoral candidate is positioned as a representative of common sense. The negation ‘cannot be concluded that’ in the text rejects the expectation in the opponent’s article that everything can be measured. The penultimate sentence in the passage includes the modal verb ‘would have had to be’, which constructs the image of a researcher measuring food portions under stable conditions. With this notion the text contrasts experimental, objective research with common sense. The application of an experimental research to this type of research becomes preposterous, demanding a great deal of time and money, and thus against practical common sense.

The response article demonstrates a type of argumentation often used to advocate qualitative research, in which the measurability of everything is denied and the analysis of personal perceptions and

experiences is valued instead. The question pulls the reader up short and strongly contrasts the tradition of measuring with the tradition of taking into account the specificity of human action. The measuring tradition is constructed as not paying attention to human action, and the other tradition as sensitive to the special characteristics of human beings and human action. The last sentence of this excerpt demonstrates the ridiculousness of the opposing view by asking whether anyone from within the science of nutrition has ever used this preposterous and ridiculous kind of research setting in which every food portion eaten by a human being is measured for as long a period as four months.

The second excerpt from the response article continues with a quotation from the last sentence of the opponent's article:

'Fasting remains more of a "belief medicine" than a real, objectively justified treatment.' In my study, the results of objective measurements were strengthened by results based on the perceptions of the participants themselves, among other things regarding their health status. Because of the expense involved, not all aspects could be measured objectively, and not everything can be measured anyway. On the other hand, the opponent from nursing science expected that the results gained through qualitative methods should have been described more broadly. (Frankberg-Lakkala, Helena 1996. Comment on the article "Does fasting work after all?" *Suomen lääkärilehti [Finnish Medical Journal]* 20–21/1996, 2175, and *Hypä Terveys [Good Health]* 6/1996, 64)

The verb 'were strengthened' in the first sentence after the quotation contrasts objective measurements with the research participants' own evaluations. The place of objective measurements in the second sentence is subordinated to the participants' own evaluations, thus promoting the status of subjective perception. Furthermore, with the verb 'strengthened', the excerpt suggests the use of a combination of qualitative and quantitative approaches. The expectation of measurement would have been met if there had been more resources. However, in the same breath the reader is reminded of the impossibility of measuring everything. This creates the impression that the reasons for not measuring the things that the opponent is said to have required were both the scarcity of resources and a reluctance to measure everything. The negation 'not everything can be measured' implies an expectation that some things cannot be measured, but it does not specify what those things are.

The last sentence points out that the other opponent expected the qualitative methodology to have been described more broadly. The idiom 'on the other hand' in the last sentence illustrates that the thesis did use quantitative measurements, exactness and surveys on the one hand, as well as the perceptions, answers and evaluations of the participants on the other. The thesis is presented in the response article as a multi-method study that has been subjected to an unfair critique that emphasises only the quantitative research tradition.

The differentiation between objective and subjective knowledge is related to the debate over the differences between quantitative and qualitative research in many disciplines. According to Igor Hanzel, who has scrutinised the qualitative-quantitative issue in the social sciences from the perspective of the philosophy of science, this divide has been constructed by several dichotomies concerning research techniques and methods, methodology, and intellectual underpinnings: a) the predominant techniques of qualitative research are observation, interviews and the use of texts and documents, whereas quantitative research draws on random sampling, measured variables, statistics and structured observation; b) the underpinnings of qualitative research are in symbolic interactionism, phenomenology and naturalism, while those of quantitative research lie in positivism and realism; and c) the methodology of qualitative research is based on understanding, while quantitative research aims to explain (Hanzel 2011). In practice the divide has been actualised in separate textbooks for qualitative and quantitative research and separate courses for qualitative and quantitative methods on study curriculums.

In the nursing research context, the qualitative-quantitative debate has been investigated by the philosopher Mark Risjord and the nursing scientists Margaret Moloney and Sandra Dunbar (2001, 45–47) in an article analysing argumentation over triangulation in nursing research. They argue that some nursing researchers have formulated a rhetoric that emphasises the different paradigmatic orientations of qualitative and quantitative research approaches. The quantitative research paradigm is seen to draw from the paradigm of the natural sciences and the positivist research tradition, whereas the qualitative paradigm is seen to draw from the human science paradigm and the humanities research tradition. The evaluation of research follows these different traditions: quantitative research is evaluated in terms of its predictive power and statistical significance, and qualitative research in terms of its internal coherence and its grounding of knowledge in the

experience of its research subjects. This constructs a sense that the qualitative and quantitative research approaches are incommensurable, and highlights the separation of the two approaches.

It is characteristic of this form of intradisciplinary boundary-work to formulate the difference between subjective and objective knowledge production. The elements of the qualitative-quantitative debate can be found in the contrast in the articles between objective and subjective knowledge, which each side uses as a stereotypical tool to silence the critique of the other. The opponent's article seems to assume that the thesis should be evaluated from the point of view of objective and experimental research, and the article by the doctoral candidate constructs an understanding of subjective views and experiences that is characteristic of the qualitative perspective. The contrasting argumentation generates an impression of cognitive incompatibility (Nowotny 1975, 43). This contrast-making form of intradisciplinary boundary-work includes argumentation that might be located in many disciplines, combining participants' own perceptions with objective techniques of measurement.

Identity work in nursing science

Yet another form of intradisciplinary boundary-work found in the conflict over fasting is the construction of the identity of nursing science. This was found in the first examination statement, and in the doctoral candidate's response article in the journal *Sceptic*. The first examination statement argues in a section headed 'The general character of the thesis':

The thesis concerns the physiological, psychological and health behavioural changes of a self-care fasting course and the suitability of fasting as a self-care method. According to the author, the aim of the research is to produce knowledge on fasting and fasting intervention and the participants' motives, aims and fears about fasting. The aim is to produce knowledge about the changes produced by the fasting intervention in health status, feelings, self-image and health behaviour, and to assess the suitability of fasting intervention as a self-care treatment, taking into account the safety of fasting. In the introduction the author does not clearly state the disciplinary field of science to which this research belongs. The delimitation of the territory of this research remains unclear. The justification for the significance of the research also

remains scanty. (First preliminary examination statement by Arja Liukkonen, 26.6.1995)

At the beginning of the statement, the main changes caused by fasting on which the thesis focuses are listed: physiological, psychological and health behaviour changes, and the suitability of fasting as a self-care method. Thus the main fields of the thesis are noted, although not all are explicitly named. Physiology and psychology are mentioned explicitly. The field of health education or health promotion is also quite clearly indicated with references to changes in health behaviour. The discipline of nursing science is indicated more ambiguously. Care and self-care in particular connect the clause about the 'suitability of fasting as a self-care method' with one theoretical strand of nursing science, namely self-care, which is particularly emphasised by some nursing science theoreticians (Virginia Henderson, Dorothea Orem). However, it is not clearly announced as a nursing scientific focus. The first sentence thus leaves the evaluation of the thesis's connection with nursing science open, including to alternative connections.

The excerpt focuses attention on what the author has not done in regard to the general character of the thesis. The negation 'does not clearly state' generates the impression that the field of research was expected to be stated openly and distinctly. The adjective 'unclear' strengthens this impression, and reveals an expectation that the territory of research should be clearly indicated in a PhD thesis. Thus the excerpt emphasises that the author has not stated the discipline of the thesis clearly, and that there is a lack of clear demarcation of that discipline from other disciplines. An added effect is gained by the use of the adverb 'also': since the thesis does not place itself clearly within any discipline, its justification for its own relevance to society is 'scanty'. The adjective 'scanty' bears with it an expectation that a PhD thesis will justify its own relevance to society as part of the positioning of the thesis in the context of the discipline's general significance to society.

In the section analysing the structure and methodology of the thesis, the first examination statement turns attention to the central concepts of the thesis:

At the beginning of the research report, according to the author, the concepts related to the methods of the fasting courses are analysed. The concepts are health, well-being, comfort, health behaviour, self-help, mood/spirits, self-image, fasting, balanced diet and health education.

From the research point of view, the most central concepts should be health, well-being, comfort and self-help (chapter 2.1), because this should be a nursing scientific research project. The author notes on page 3 that 'health, well-being, comfort and self-help have been discussed widely and in detail in the nursing practice and nursing science literature. For this reason these topics are only briefly covered in this research.' The scrutiny of the central concepts is eclectic, shallow and negligent, which means that the 'foundation stone' of the research remains unbuilt. (First preliminary examination statement by Arja Liukkonen, 26.6.1995)

The text expresses an expectation that a nursing science thesis will contain the concepts of health, welfare, well-being and self-care. According to the statement, these concepts belong to nursing science research. From the excerpt it can be concluded that the central concepts of research in a nursing science thesis can also be regarded as central to nursing science more generally. From the use of such concepts, a thesis can be recognised as a nursing science thesis. The statement describes the identity of a nursing science thesis, and thus also constructs the field of nursing science. Therefore in this excerpt, nursing science identity work is being done in order to demarcate a nursing science thesis from theses in other fields.

The argumentation continues with a quotation from the thesis, in which the doctoral candidate writes that she has dealt with the central concepts of nursing science only briefly. This is used to demonstrate the author's decision to cover only briefly the important central concepts of nursing science, which according to the first examination statement should have been dealt with at length. Furthermore, the use of the evaluative adjectives 'eclectic', 'shallow' and 'negligent' bear with them the expectation that the central concepts should be scrutinised in a well-defined, profound and meticulous manner, instead of in the careless way in which the author has treated the concepts. The author has even stated, according to the quotation, that they have already been so widely discussed in nursing science literature that there is no longer any good reason to analyse them at length in the thesis. Both the quotation and the list of undefined nursing science concepts demonstrate the first examination statement's expectation or presupposition of the use of certain concepts in a nursing science thesis, the criteria for which become visible in the use of the field's specific terminology. The list of concepts belonging to nursing science also demarcates the other concepts – health behaviour, feelings/mood, self-image, fasting, balanced diet and health

education – as outside nursing science and thus as belonging to other fields.

The use of the ‘foundation stone’ metaphor in the last sentence gives a connotation of construction work, which is conducted in an organised and technical way. The section in which the metaphor is used is meant to focus specifically on the structure and methodology of the thesis, in other words on the techniques of research, and the metaphor strongly connotes the absence of the fundamental aspects of research. The message of the excerpt becomes clear: the sloppy use of the central concepts of nursing science, and the absence of the fundamental aspects of a nursing science thesis, are crucial and unforgivable.

In the concluding section the statement goes on to assess the theoretical starting points of the thesis:

The draft of licentiate Frankberg-Lakkala’s thesis ‘Health and well-being through fasting’ handles a topical theme. The theoretical starting points of the research are presented in a disjointed and scanty way. The author uses knowledge of the issue in question at some length, but shallowly. The author also has not sought up-to-date knowledge, but has contented herself with outdated knowledge. This relates especially to nursing knowledge. There should be a more critical approach throughout the work. Thus I find that I cannot recommend that permission for publication be given to Frankberg-Lakkala’s work. (First preliminary examination statement by Arja Liukkonen, 26.6.1995)

The excerpt uses the evaluative adjectives ‘disjointed’ and ‘scanty’, which bear with them the expectation that a thesis will provide clear descriptions and a strong rationale. In the second sentence of this concluding section, the statement gives limited credit to the author for using knowledge about the topic of the research. However, the contrasting conjunction ‘but’ is used to contradict the beginning of the sentence, and this reservation is then specifically targeted at the use of nursing science knowledge. The contrast pair ‘latest-outdated’ in regard to the knowledge used by the author also further emphasises the poor use of knowledge, and this is presented as especially relevant to the use of nursing science knowledge. The word ‘outdated’ in the contrast pair is further emphasised by the use of the verb ‘contented herself with’, bearing the negative connotation that she has not done all that could have been done. Before the last sentence the examiner uses the adjective ‘more critical’, which also comes with the

connotation that the research is not sufficiently critical to be taken seriously as a nursing science thesis.

In the last sentence of the excerpt there is the negative expression 'cannot'. This implies the expectation that an examination statement will advocate that the thesis be given permission for publication. This is the practice with PhD theses: the examiners recommend that permission for publication be given to the thesis. On the basis of the negative impressions presented, the statement cannot advocate that this thesis be published, and especially not that it be published as a nursing science thesis. In sum, the concluding section of the first examination statement enumerates the criteria for a good nursing science thesis: it should be meticulously presented, strongly argued, use the latest knowledge – especially from the main discipline – and maintain criticalness throughout the research.

The emphasis on the conceptualisation and development of the theoretical framework may be connected with the wider context of nursing science identity work, which was seeking to define the theoretical development and main concepts of nursing science alongside the field's other values and domains. According to Tuomi (1997), who has analysed scientific discussions in Finnish nursing science, one focus of discussion was to determine the main concepts of nursing science to be used in the formulation of nursing science's theoretical basis. Tuomi (1997, 112) refers to this as the paradigm discussion.

In the context of this thesis procedure, this discussion was inspired by the literature used on the nursing science curriculum at the University of Tampere. For example, one of the textbooks that remained on the curriculum the longest (from 1988 to 1997) was *Theoretical Nursing* by Afaf Ibrahim Meleis, which examines the definition of nursing science concepts: nursing, clients, health, nursing problems, the environment, and nurse-patient interactions (Meleis 1985, 223). The argumentation of the first examination statement creates an impression of a well-defined conceptual basis, which from the outside might be interpreted as a strong scientific programme. Moreover, the criteria given for a good nursing science thesis create the effect of legitimising nursing science through the argumentation. The legitimisation of nursing science is sought by listing the deficiencies and errors of the thesis. The identity work of nursing science is thus performed by inspecting the shortcomings of the research, thereby

highlighting the accuracy of the evaluation criteria and establishing the scientific nature of the field.

The construction of the discipline of nursing science through active conceptualisation and theorising protects the autonomy of the discipline. Gieryn (1999, 17) likens boundary protection to constructing a defensive wall. The protection of autonomy in the case of the first examination statement includes both defending the power to decide on the main concepts and theoretical basis of nursing science research, and guarding the reputation of nursing science. The act of boundary protection therefore bears with it fears that the thesis (in its form at the time of the evaluation) might damage the possibility of independent conceptualisation, or might weaken the reputation of a precarious newcomer discipline in the eyes of the more established disciplines in the faculty of medicine.

The doctoral candidate also constructs the identity of nursing science in her response in *Sceptic*:

I completed intermediate studies in nursing and administrative science. Perhaps it was because of the topic of the research, or because nursing science is relatively young and its representatives partly 'unsure', that I did not get a supervisor from nursing science. The designated supervisor from nursing science was the UKK Institute's senior researcher, who in the first meeting declared that he did not know anything about nursing science. This is why in my thesis I gave the nursing science view less [attention] and scrutinised the psychological and medical field more broadly. In these fields the supervisors were qualified experts, and the same applies to statistics. (Frankberg-Lakkala, Helena 1996. A response to the article "From the editor" in *Skeptikko* [*Sceptic*] 3/96.' *Skeptikko* [*Sceptic*] 1/97, 38–39)

The first sentence of the excerpt presents the orientation of the doctoral candidate to her studies. Together with the negation 'did not get', the text generates an impression that the supervisor was expected to be selected from nursing science, as the candidate's studies had been completed in nursing and administration science. The combination of nursing and administration science is a very common option for nurse administrators. Administration science was one of the options available for nursing science students at the time (the other most common option was education science, see Tampereen yliopisto 1996), so this excerpt makes it appear all the more natural that this combination would mean that the supervisor of a nursing science thesis would come from nursing science him- or herself.

The beginning of the excerpt indicates an expectation that the doctoral candidate would have been given a supervisor from nursing science, but that this expectation was not met and the supervisors were chosen from other fields. My observations of two nursing science departments in Finland show that before 1996 it was more usual to appoint at least one supervisor from other fields than to appoint supervisors exclusively from nursing science. In the universities of Kuopio and Tampere, which are the universities that had developed active doctoral education in nursing science at that time, eight out of a total of 13 theses had supervisors from other fields alongside nursing science supervisors. However, the supervision process in the case of the fasting thesis was unique in the sense that no other such process had ever been conducted with no supervisor from nursing science at all.

The excerpt defines nursing science in three ways. First, the discipline is depicted as ‘relatively young’, with not so many years behind it, and this also connotes immaturity. This notion may relate to the short history of Finnish nursing science at the university level. The first official university teaching programme in nursing science started in 1979 at the University of Kuopio, followed by several other programmes during the 1980s (Laiho 2005, 227). Julie Thompson Klein (1996, 131), who has analysed the struggles of emerging interdisciplinary fields, claims that new disciplines need to pave their way beyond existing, authoritative disciplinary structures. The notion in the response article of the novelty of nursing science as an academic discipline generates the sense of a disciplinary hierarchy in academia, in which younger and more immature fields undergo an ongoing legitimation process while older and more mature fields have already acquired credibility and power.

Second, the contrast pair ‘unsure-qualified’ creates the effect that the nursing science discipline characteristically has less confident representatives and relatively less qualified experts than the other fields mentioned, i.e. psychology, medicine and statistics. The evaluative adjective ‘unsure’ is presented within quotation marks, which creates the impression that the word is being used ironically, with a meaning outside the ordinary, and this allows many meanings to be conveyed. The adverb ‘partly’ in front of the adjective ‘unsure’ ambiguously assigns the unsureness to only some representatives of nursing science or to some of those representatives’ actions. The adverb ‘partly’ thus proportionalises the discipline’s unsureness and

constructs some parts of the discipline as uncertain or undecided. Therefore some elements of nursing science are constructed as being so unsure that the doctoral candidate did not get a supervisor from nursing science.

Third, the field is presented as an unknown and less noteworthy field with the statement that the senior researcher did not know anything about nursing science. The extreme expression 'not anything' maximises the unfamiliarity of the discipline and creates the impression of a field that is uncommon and only known by a few specialised experts. Thus the authority of the supervisor is presented as leading the thesis to be focused in a certain way. The weakness of the discipline is illustrated by a description of the details that led to a change in the focus of the thesis. The discipline of nursing science is depicted as having been removed from the thesis as if it were an obstacle. The importance of the discipline is shown to have been denied, and its use to have been neglected because the supervisor was unaware of the field as a whole. This creates the effect that the boundary between traditional and scientific knowledge is an important starting point for research, and that the development of the field of nursing science is a less meaningful starting point for the thesis.

The doctoral candidate concentrates on the practical level of the doctoral thesis process, and presents her perceptions based on her experiences and difficulties in finding a supervisor. Her excerpt depicts nursing science as an unsure, young discipline that is unknown by other disciplines. The candidate's boundary-work is done from the position of a student who is trying to get support for her doctoral work and who knows the discipline from her studies. She does not look at it from the inside, like the first examiner, as an actor of the discipline. Thus she assumes the authority to judge the discipline from an outsider position.

It is characteristic of this last form of intradisciplinary boundary-work found in the conflict over fasting to utilise broader discussions and self-understandings of nursing science to construct the identity of the discipline. As such it differs from the three other forms of boundary-work, which utilised discussions of other disciplines to evaluate or justify the thesis in nursing science.

Nursing science in intradisciplinary boundary-work

To sum up, intradisciplinary boundary-work in the conflict over fasting consists in formulating the internal norms of the discipline, particularly the norms of literature use in a thesis in nursing science. The criteria and principles for conducting research are negotiated. Subjective and objective knowledge forms are separated from each other. Intradisciplinary boundary-work also constructs the identity of the discipline.

One way of interpreting the view of nursing science in the first three forms of intradisciplinary boundary-work is that nursing science is depicted as an unsteady and unsure discipline that leans on other, stronger disciplines in its intradisciplinary boundary-work. This type of view is most strongly represented by the opponents' statement and the candidate's response to the *Sceptic* editorial. In the construction of good and poor research, the principles of experimentation are used as starting points, and the evaluation is attached to the framework of evidence-based medical practice. Thus the independence of nursing science is limited, and it is presented as subordinate to medical practice. The identity of nursing science is constructed as a discipline that combines a wide range of scientific methods, leading to a view of the discipline as unsteady and precarious.

In intradisciplinary boundary-work, nursing science also appears as an inherently independent and strong discipline that is able to outline the norms of its own research. These qualities of nursing science appear to be particularly characteristic of the first examination statement. This form of intradisciplinary boundary-work thus legitimates the autonomy of nursing science to decide the norms of its own research, and demonstrates the power of nursing science to defend the correctness of the principles of research employed in a thesis in nursing science. It also generates concepts and theoretical frameworks for research in nursing science.

The qualities of nursing science are most richly discussed in the fourth form of intradisciplinary boundary-work, which articulates the identity of the discipline. The qualities of an independent and comprehensive discipline and those of a young, unsure and dependent discipline alike are attributed to nursing science by the various authors.

Interdisciplinary boundary-work

The aim of this subchapter is to analyse interdisciplinary boundary-work in the conflict over fasting. The interdisciplinary boundary-work was discovered to consist of two forms: contrasting disciplinary and multidisciplinary views, and extending views with multidisciplinary. The argumentation was found in the third examination statement by the examiner from physiology, and in the response statement and response article by the doctoral candidate.

Contrasting disciplinary and multidisciplinary views

The first form of interdisciplinary boundary-work appears in the third examination statement, which contrasts a disciplinary with a multidisciplinary view. The statement argues:

I have had available the statements given by professor Osmo Hänninen [second examiner] and docent Arja Liukkonen [first examiner], and the statement by Arja Liukkonen is very critical, especially when it comes to the proportion of nursing science in the work. Without being an expert in nursing science, as I see it, the work submitted as a doctoral thesis first demonstrates the ‘efficacy’ of fasting with biomedical tools, that is, we see changes in, among other things, lipid metabolism (the results of which do not as such reveal anything new, but on the other hand are in line with previous results showing the efficacy of fasting), while with behaviour science (and also epidemiological) tools it demonstrates the effects on participants’ mood and other feelings, health behaviour and other life-related issues, partly also with overlapping methods (which as such also increases the validity of this type of research); as Arja Liukkonen states, the ‘pure’ nursing science part remains mainly discursive in this work. As a matter of fact, I do not deem it appropriate to classify PhD theses strictly by certain disciplines, nor to remain strictly within certain orthodox disciplinary boundaries. Rather, interaction with other closely related disciplines advances the development of the ‘home’ discipline. (Third preliminary examination statement by Eino Hietanen 29.11.1995)

At the beginning of the third examination statement, the name of the first examiner is mentioned, and it is said that the first examiner’s statement was ‘very critical’. Moreover, it is stated that the first examiner was particularly critical of the proportion of material concerning nursing science in the thesis. The use of the evaluative adjective ‘very critical’ conversely produces the expectation of a more

approving statement, and thus marks the possibility of a more appreciative attitude towards the thesis and its use of nursing science. The name of the second examiner is mentioned, but the second statement is not evaluated, nor are the contents of the statement detailed in any way. By evaluating the first statement and not the second, the third statement gives the impression of a situation in which the second and third examiner are invoked as allies and the first examiner as critical and different, at least in such a way as to be regarded as exceptional and to be evaluated as very critical. It must be noted that the second and third examiners both represented physiology, whereas the first examiner represented nursing science.

The excerpt positions the third examiner within the scene of the examination process by denying him any expertise in nursing science. However, although he does not consider himself an expert in the field, the excerpt gives the impression that he can nonetheless make a statement on a field with which he is unfamiliar. In this way, the third examiner positions himself as an outsider to the discipline, but also as looking at the discipline from a superior position: the representative of an established field of medicine gives a statement on a piece of research from the newer, precarious discipline of nursing science. The superior position becomes clearer at the end of the statement, when the excerpt gives directions to the discipline as a whole: it advises that it is not appropriate to classify theses, and that it is not suitable to stay within one disciplinary perspective.

The statement implies that it is relatively easy for an evaluator to see the three disciplines whose tools have been used in the thesis: biomedicine, behavioural sciences and epidemiology. The interaction of the disciplines is presented in the excerpt. The fields of biomedicine and behavioural sciences are stated more strongly and independently, and the field of epidemiology is presented in parentheses. Biomedicine according to the text is used to prove the 'efficacy' of fasting. The noun 'efficacy' is placed in inverted commas, which suggests that the writer does not quite intend to use the exact meaning of the word. With the inverted commas efficacy is given an ironic secondary meaning, which gives the impression of a somewhat speculative kind of efficacy. Efficacy is then categorised as changes in lipid metabolism. The field of behavioural sciences according to the excerpt is used to measure mood and other feelings, health behaviour, and other factors affecting life.

However, when it comes to the proportion of material from nursing science, the text implies a different story. This is marked with a semicolon, which shows that the contents of the next clause need to be separated from the earlier point, and the impression is given of a distribution of work between the disciplines of biomedicine, behavioural sciences and epidemiology. The sentence first panders to the first examination statement and even puts words into the first examiner's mouth. According to the third statement, the first statement had argued that 'the "pure" nursing science part remains mainly discursive in this work.' The word 'pure' defining nursing science is presented in inverted commas, which suggests that the word is used with a slightly different meaning than would be expected; it has an ironic secondary meaning, presenting the first examiner's statement in a distorted light. The purity called for by the first examiner is not viable, and this strengthens the offensive action taken in the next sentence and undermines the first examination statement's argumentation. The expression 'mainly discursive' indicates that nursing science could have been specified more extensively, but that instead there is a lack of substantive focus on nursing science in the thesis.

After undermining its adversary, the excerpt attacks the first examination statement and categorises its writer among those who classify theses by disciplinary field and who wish to remain firmly inside one discipline. The categorisation in the excerpt is of 1) those who classify theses by disciplinary field, 2) those who wish to remain strictly within orthodox boundaries, and 3) we who value interaction with other nearby disciplines. The first and second categories do not include the third; in other words, those who classify theses by disciplinary field and wish to stay inside boundaries do not value interaction with other disciplines. This is established by giving a recommendation in the last sentence of the excerpt about interaction with other disciplines, which advances a discipline that can, ironically and somewhat speculatively (the use of inverted commas again), be considered as somebody's home discipline. The verb 'advance' generates a picture of multidisciplinary as progressive and dynamic, and a view of nursing science as outdated and static. Interaction between disciplines is contrasted with staying within one disciplinary field, and the former is favoured while the latter is condemned and presented as absurd. The contrasting linking word 'rather' contradicts the messages of the sentence before it, and starts a new thought about

the fruitfulness of multidisciplinary interaction for the development of individual disciplines.

There is a discrepancy between the first and third statements in regard to the interpretation of the interaction between disciplines. The first examination statement does not give the impression that it would be a bad idea to interact with other disciplines. In fact, the statement does not discuss interaction between disciplines at all. The idea of interaction between disciplines comes from the third examination statement, not the first. The first statement does pay attention to the disciplinary field of nursing science by highlighting the poor and unclear use of concepts and the lack of clarification of theoretical starting points, as I have analysed above in relation to intradisciplinary boundary-work. It also points out that the characteristics of nursing science should be found in a nursing science thesis, and thus presents the concepts and theoretical starting points as a boundary of nursing science. However, the first statement does not deny the benefits of interaction between disciplines, nor does it state that disciplinary concepts and theories would rule out interaction with other fields. The idea of staying inside one disciplinary field and its orthodox boundaries comes from the third examination statement, which undermines the argumentation of the first statement and brings attention to the strikingly different criteria used in the first and third statements.

By comparison with the first statement, the third examination statement includes surprisingly little evaluation of the thesis's theoretical frame of reference and conceptual formulations. The statement briefly mentions that the thesis 'includes a quite extensive literature review' and that 'the results have been made proportional to existing literature in a fairly satisfactory way,' but the accuracy of the use of concepts and the rationale for the theoretical background are not discussed. Instead the third statement concentrates on biomedical measurements and methodology, and highlights the thesis's familiarity with manifold methods from different fields. The first statement, for its part, discusses biomedical methodology only briefly, always connecting it to the theoretical framework, in this vein: 'It remains unclear to the reader how the indicators utilised stem from the theoretical part of the work,' or 'Also, the author does not sufficiently justify the methods of data collection utilised and their theoretical starting points.' The first statement focuses on the evaluation of the theoretical framework and the use of concepts in the thesis, whereas

the third statement pays attention to the methodological accuracy of the thesis. In other words, the two statements' evaluation criteria seem to differ greatly.

Furthermore, interaction between disciplines is understood differently in the first and third statements. The first statement does favour remaining within the thesis's main discipline theoretically and conceptually, but it does not say anything about interaction between disciplines. The third statement does favour multiple methods from different fields and suggests an interaction between disciplines, but it does not evaluate the theoretical background of the study in any detail. The multidisciplinary approach appears in the third statement in relation to the interaction between disciplines, which means the use of multiple methods from different disciplines and also something broader and more open than that, as is revealed by its interpretation of the multidisciplinary of the first statement as staying inside the boundaries of one discipline.

A characteristic of the contrasting of disciplinary and multidisciplinary views is the promotion of multidisciplinary. This thesis was the fifth in nursing science at this university, so the tradition of the thesis procedure had not yet been stabilised at the time of this particular procedure. However, two PhD examination procedures had already acted as meeting points for different disciplinary traditions, and the interaction of medicine and nursing science had already been seen in the first examination procedure, so some experience had been gained from this type of administrative meeting between different disciplines.²¹ The contrast is drawn by promoting the multidisciplinary approach as more open and fruitful, and the disciplinary approach as incomprehensible and fruitless.

The contrast creates a multidisciplinary community with a sense of its own worth. The sense of having a distinct multidisciplinary specialism and culture is generated by the network of actors involved in the contrast. Its principles and practices differ from those of the disciplinary community of nursing science. The objective of the contrast is to create a distinct kind of knowledge and to emphasise its value and superiority over disciplinary perspectives. This marking of the multidisciplinary approach confronts and resists the disciplinary rules and norms presented by the first examiner, and establishes the

²¹ The first thesis, by Nojonen (1990), was examined by representatives from medicine and nursing science, and the second, by Kiikkala (1991), was examined by representatives from statistics and nursing science.

credibility of the multidisciplinary approach. A need for regeneration and openness is created, and this necessitates the existence of a stagnant and inward-looking counterpart, in this case nursing science (on stagnation and ossification, see Becher 1990a, 340).

This form of interdisciplinary boundary-work was performed by labelling the nursing science identity work involved in conceptualisation and theoretical framework-building as barricading oneself inside one disciplinary tradition. Adhering to one discipline is presented as safeguarding the boundaries of the discipline, akin to Klein's (1996, 167) description of the creation of a separating barrier. The separating barrier is created in the first place by resisting the act of barricading, even though that barricading is not quite explicit. A picture of barricading and safeguarding is presented, but in fact the argumentation itself creates a situation that excludes the possibility of simultaneously remaining within one discipline and being open to outside influences.

It is characteristic of this first form of interdisciplinary boundary-work to juxtapose disciplinary and multidisciplinary views. This is done in the third examination statement, the author of which is from medicine. He reacts to the identity work by the first examiner, and promotes a multidisciplinary approach. This form of interdisciplinary boundary-work does not reveal much about the relations between disciplines.

Extending views with multidisciplinary

The second form of interdisciplinary boundary-work extends multidisciplinary to alternative medicine and holism. This argumentation is found in the response statement and response article by the doctoral candidate. The response statement consists of direct quotations taken from the first examination statement and replies to its criticisms. Altogether the response statement consists of five quotations and answers. For the purposes of understanding interdisciplinary boundary-work, I will analyse one quotation and one direct answer from the response statement.

'The delimitation of the territory of this research remains unclear. The justification for the significance of the research also remains scanty' (Liukkonen). I see nursing science as very wide-ranging. It applies views from many disciplines, and also alternative treatments, in this case fasting,

can be attached to it. In my earlier drafts I made a strict categorisation of the different fields of research and the views of different disciplines, but this was eliminated at the suggestion of my supervisors. On the basis of Liukkonen's statement I have made additions, e.g. on the delimitation of the research and the views on page 3. (Doctoral candidate response statement by Helena Frankberg-Lakkala 1/14.8.1995)

In the first sentence following the direct quotation, the evaluative adjective 'wide-ranging' presents nursing science as extensive. It suggests that breadth is preferable to narrowness when looking at nursing science. Then the argument is quantified by stating that nursing science applies views from many disciplines. The disciplines are skipped over, and it is not specified exactly which disciplines are meant. The quantification with the word 'many' gives the impression that it is clear and agreed knowledge that the field applies views from different disciplines. The sentence presents nursing science as a field that uses many disciplinary backgrounds. The word 'many' leaves open the exact number of disciplines, and creates a sense of universality through the application of many disciplines.

The implication about universality and the application of many disciplines is all the more important in the next sentence. The text moves beyond the many disciplines and suggests that alternative treatments, particularly fasting, may also be connected to nursing science. The expression 'can be attached' is a modal verb, the use of which hints that alternative treatments are contained within nursing science, according to the author's understanding. 'Can be attached' also indicates that alternative treatments are not always included in nursing science, or that not all people include them in the discipline. The two-part clause generates a view of nursing science in which the use of many disciplines and the application of alternative treatments are connected. Of the two, the use of many disciplines is more unambiguously included in nursing science, while the application of alternative treatments is introduced with a slight reservation, including the possibility that not everyone would include them in the discipline.

The excerpt then moves on to explain why the perspectives of different disciplines are not explicated more clearly. From the excerpt it seems that the reason was a conscious decision made on the basis of the supervisors' suggestion. According to the excerpt, previous drafts had included a clear categorisation of different points of view from different disciplines. The voices of the supervisors are brought in to support the argument, which presents the decision as a joint effort

with the supervisors. The doctoral candidate did not make the decision by herself, but was advised by her supervisors and obeyed. The argument brings attention to the process of the thesis, in which the supervisors have the authority to define what needs to be included in the text. Simultaneously it diminishes the power of the doctoral candidate to make independent judgements about what to include in the thesis and what to leave out.

In this way the thesis work becomes a negotiation process between the doctoral candidate and the supervisors, and hands at least part of the candidate's responsibility to the supervisors. It still leaves the candidate on safe ground: according to the excerpt, she has been aware of the importance of clearly presenting views and aspects concerning all of the disciplinary backgrounds involved. The wording also presents the supervisors' advice as an opportunity to wash her hands of the full decision. The author has already made the effort to have all the disciplines included, but the supervisors disagreed with this genuine effort, which was in line with the first examiner's demands. Thus on the part of the author, the game is clear: the dilemma between either going deeply into all the disciplinary perspectives in the thesis or whittling them down to a narrower explication of each one is solved by doing what was expected by the supervisors. The excuse for not presenting the many disciplinary views at full length is actually attributed to the supervisors.

In the excerpt, multidisciplinary means applying many disciplinary perspectives, and this can be complemented with the perspectives of alternative treatments. It must be noted again that the first examination statement did not mention multidisciplinary and did not call for a classification of all the different research areas and disciplines. Instead, the first statement focused on the use of concepts and the construction of the theoretical framework, and was concerned about the shallowness of the nursing science background in the thesis. The response statement constructs a vision of nursing science as having a wide scope, and creates a broader possible inclusiveness of the field than the understanding of nursing science in some unnamed quarters. The first examination statement and the response statement seem not to meet each other on the same level, as my analysis of the texts by the two examiners has shown: one text calls for a profound theoretical analysis of concepts and theories, the other centres on the wide variety of views and perspectives involved.

The response article by the doctoral candidate presents a view of multidisciplinary in a similar vein:

The main objective of my research was the (holistic) view of human health as a whole from the perspectives of three disciplines. The cooperation with experts from different disciplines turned out to be fruitful. However, the whole is not always seen. The article by Fogelholm represents a narrow, 'sliced' view. It was troublesome to find preliminary examiners and opponents for the thesis who held a holistic view. On the basis of the experience of my research process I argue that, from the holistic human health perspective, one cannot stay within the perspective of one single, narrow discipline. It would be preferable if representatives from different disciplines were to try to broaden their view. A future challenge, especially in the health sciences, would be this type of research, in which the study extends to many disciplines. (Frankberg-Lakkala, Helena 1996. Comment on the article "Does fasting work after all?" *Suomen lääkärilehti [Finnish Medical Journal]* 20–21/1996, 2175, and *Hyvä Terveys [Good Health]* 6/1996, 64)

The excerpt starts with a definition of the research objective, which here is formulated as overall health. The word 'holistic' is placed in parentheses after the research objective, thereby positioning 'holistic' as a specifying word that has a synonymous meaning with the main concept, overall health. The parentheses also stop the reader for a short moment and make her think about the word, which gives more emphasis to the specification. The word holistic in relation to health gives a connotation of holistic medicine, which attempts to care for the whole human being. Holistic medicine is particularly associated with alternative treatments. It also gives a connotation of nursing science, in which the human being has often been defined as a bio-psycho-social whole. This holistic human health, according to the text, is captured by applying perspectives from three disciplines.

Holism in connection with human health connotes holistic medicine, or complementary and alternative medicine. Holistic medicine emphasises the inseparability and unitary nature of the physical, mental, social and environmental dimensions of health, and simultaneously resists the specialisation and sectoral thinking of academic medical science (Vaskilampi and Pylkkänen 1983, 1062, Svennevig 2003, 36). Holistic medicine extends the edges of scientific knowledge production, as the bases of knowledge are located outside the natural sciences' sphere of knowledge formation, and the validation of knowledge lies outside the scientific curriculum.

Furthermore, the practices of curing and caring carried on by official healthcare professionals are widened to include unofficial professional and non-professional therapists of various kinds. Thus the extensive multidisciplinary argumentation encompasses scientific rules and norms as well as professional boundaries and qualifications.

Holism associated with the health of the human being can be related to the discussion in nursing science of the idea of the human, which has emphasised the comprehensiveness of the human being and the inseparability of mind and body. Tuomi (1997, 101) argues that the discussion in Finnish nursing science of the idea of the human centred at first on the United Nation's World Health Organisation's definition of the human being, which sees the human being as a physical, mental and social whole. Later on, the nursing science discussion began to include the perception of the entirety of the human as a sensing, thinking and social being, and emphasised the inseparability of these as dimensions of the whole (Eriksson et al. 2007, 75). The extensive multidisciplinary argumentation during the thesis procedure interlinks with this definition, which is surprisingly close to the definition of holistic medicine.

Nevertheless, the seeming similarity of holistic thinking with nursing science's definitions of its own field in Finland has not led to the extension of scientific knowledge to unscientific knowledge spheres in a similar manner to holistic medicine, nor has it extended to unofficial and non-professional curing and caring. On the contrary, Laiho (2005, 270) argues that nursing science in Finland, as well as in the other Nordic countries, has mainly concentrated on the establishment of a scientific knowledge base and the development of the clinical practices of one specific professional group, i.e. nurses.²² The comprehensive idea of the human has been part of the nursing science ethos, and this has been used in nursing science's legitimation process as a counterbalance to specialised medicine. The power of the thesis procedure, especially in the excerpts by the doctoral candidate, is used to open up nursing science to several disciplinary knowledge bases and to extend it even further, to the alternative treatment knowledge base that has previously been excluded from the discipline.

²² This has also been suggested internationally. For example, Cole and Shanley (1998) see complementary therapies as sharing a similar world view with nursing's holistic approach, and Tiedje (1998) sees nursing as philosophically congruent with many alternative therapies, with which it shares common holistic philosophies of health.

Earlier in the response article, the disciplines in question are defined: nursing science, medicine and psychology. In the excerpt above, the multidisciplinary approach is defined as a perspective on the research objective from the viewpoint of the disciplines involved, and as a collaboration between experts from different disciplines. The excerpt includes the author among the experts who collaborated. The evaluative adjective 'fruitful' implies the expectation that if there had been no collaboration between the disciplines, the research would have been fruitless or at least less fruitful, which places further emphasis on the multidisciplinary collaboration.

The division between 'broad' and 'narrow' is strengthened throughout the excerpt by being repeated several times: being broad, holistic and multidisciplinary is fruitful, being narrow and holding onto one discipline is not fruitful; the holistic view covers many disciplinary perspectives, but sticking to one discipline is exclusive. The connotations of 'holistic' and 'multidisciplinary' are positive, while the connotations of 'narrow' and 'disciplinary' are negative. This repetition underlines the significance of the multidisciplinary view and emphasises the main message of the excerpt: to present disciplinary research as weak and narrow and multidisciplinary research as wide, even omnipotent. With the narrow-broad and narrowing-broadening contrast pairs, a new type of holistic and multidisciplinary research agenda is created. The expression 'future challenge' attaches the views that apply many disciplinary perspectives to a positive new future, a more modern period in health sciences. This agenda is presented in the excerpt as new and emerging – the agenda of the health sciences of the future – and simultaneously the narrow view that holds onto one discipline becomes old-fashioned and isolated. The holistic view reaches out to many disciplines, the disciplinary view is limited to one perspective.

In the argumentation, the disciplinary view demonstrates borders and boundaries, the multidisciplinary view infinitude and boundarylessness. That which the excerpt regards as disciplinary is presented as unquestionably exclusionary, and that which is multidisciplinary is presented as unquestionably inclusive. There is no possibility that the disciplinary view might be inclusive and broadening, or that the multidisciplinary view might become exclusive. In other words, the view of multidisciplinary research is close to what Klein (1996, 13) calls 'euphoric interdisciplinarity', meaning unanimous holism or ideological multidisciplinary, which does not

create any possibility for the simultaneity of multidisciplinary and narrowness, or of disciplinarity and broadness, where human health is concerned.

The phrase 'the whole is not always seen' intertwines the collaboration between many disciplines with the holistic view. Collaboration and holism in the excerpt enable the researcher to see the phenomenon in its entirety. The excerpt allows an expectation to arise that this entirety is not always seen, and thus it emphasises the possibility that the broad multidisciplinary perspective might sometimes be neglected. With human health at the centre of the research, the phrase 'the whole is not always seen' invokes a group of people that do not see human health as a whole, but instead see human health one piece at a time, and do not make the necessary connections either between the separate parts of the body or between the separate spheres of body, mind and environment. The human health seen by this group is 'sliced' and 'narrow'. The other group see human health as a whole and represent the holistic view. They see a version of human health that is indivisible and unitary, and that must therefore be looked at from different angles. The first category especially includes the opponent, who is named, but also others who do not hold the wide, holistic view and instead view human health narrowly, as if cut up into pieces. Nobody in the second group is explicitly named, but the excerpt indicates that a limited group among the examiners and opponents, and naturally the doctoral candidate herself, could be categorised in the second group.

The notion that it was difficult to find examiners and opponents, indicated by the adjective 'troublesome', calls into question the competence of the examiners. Simultaneously it positions the doctoral candidate as evaluating the examiners, which gives an impression of self-assurance on the part of the candidate. At the end of the statement the candidate gives directions for the future of the field as a whole, which from a doctoral candidate demonstrates assertiveness. The excerpt from the article, which appeared both in a widely read popular magazine and in the field of the medical profession, uses the space to criticise the evaluation procedure, and presents the doctoral candidate as competent to evaluate the field of health research as a whole. In doing so it takes up the power to condemn the present status of the field of health research as narrow and as barricaded within a single perspective.

Extensive multidisciplinary leads to multidisciplinary holistic health research, through which a broad perspective on the research topic is attained. Multidisciplinary holism makes possible an extensive, holistic and broad view of human health, instead of the disciplinary, narrow and blinkered view. This extensive multidisciplinary includes the understanding that comprehensive is better than specialised, holism is better than division, and seeing the human as a whole is better than seeing one part of the human at time. The extensive multidisciplinary perspective draws from three different lines of thinking: holism connected with human health, comprehensiveness connected with the idea of the human, and multidisciplinary holism connected with problem-based research.

It is characteristic of this form of interdisciplinary boundary-work to extend views with a multidisciplinary approach. This boundary-work omits the voice of nursing science, and these excerpts show that nursing science is viewed from the outside, from the perspective of medicine and alternative treatments. As one option to survive the narrow disciplinary view, opening up to other perspectives and reaching out to other disciplines are presented as a way to diversify the disciplinary methodology and base. A further possibility is to extend the boundary between scientific and unscientific to include alternative treatments, and to establish research that views human health holistically.

Nursing science in interdisciplinary boundary-work

Interdisciplinary boundary-work in the conflict over fasting is done by contrasting disciplinary and multidisciplinary approaches and extending views with multidisciplinary. Both of these forms of boundary-work are articulated from outside the discipline. The interdisciplinary boundary-work does not contain much argumentation about the actual relations of nursing science with other disciplines, or about how interdisciplinarity is enacted in nursing science. The relationship with medicine comes up only to the extent that representatives of medicine express their views of nursing science in the excerpts analysed.

In the early discussions within nursing science in Finland, the discipline was seen as rooted in many disciplinary traditions. Among the disciplines identified as having an effect on the development of

nursing science were medicine, social science, behavioural sciences, pedagogics, humanities, and other health sciences (Tuomi 1997, 91–92, Lauri and Elomaa 1995, 64–66). Nursing science's relations with health sciences and medicine have been characterised by differences, but also by the common goal of the well-being of patients and better health for the population (Tuomi 1997, 87). At the same time, nursing science has been seen as a new discipline which has to strike a balance between, on the one hand, applying multidisciplinary to find new perspectives and, on the other, carving out its own space by developing a clearly distinguishable research tradition. The contrasting of multidisciplinary and disciplinary approaches in part reflects this balancing act by the new field between academic identity-building (Henkel 2000, 205), marked by discipline-specific norms and values (Becher 1990a), and the multidisciplinary practices and traditions belonging to disciplinary structures (Klein 1996, 22, 131).

On the basis of interdisciplinary argumentation, nursing science gets constructed as an unstable newcomer discipline that needs perspectives from other disciplines. A multidisciplinary community is generated inside the academic health research community. Multidisciplinary is particularly embodied in the excerpts from the third examiner and the doctoral candidate. In the construction of a multidisciplinary community, nursing science is seen as not being amenable to many perspectives, and as unwilling to seek common ground with other disciplines. Nursing science is presented as strict and limited, refusing to see the apparent similarity between complementary and alternative treatments and nursing science.

Boundary-work between science and society

This subchapter presents the boundary-work between science and society in the conflict over fasting. The boundary-work between science and society was found to take three forms: the generation of relevance through popularity, the mediation of health by science for society, and the profitability of science. This argumentation was found in the second and third examination statements, the TV newscast, and the local and national newspaper bulletins.

The generation of relevance through popularity

The first form of boundary-work between science and society consists in the generation of relevance through popularity. The relevance of the thesis is generated in both the third examination statement and the opponents' statement. The third examination statement points out:

The choice of fasting groups for scrutiny is fully justified in itself, because many forms of fasting are indeed very popular nowadays. (Third preliminary examination statement by Eino Hietanen 29.11.1995)

This sentence is taken from the middle of the third examination statement. It is the only sentence in the statement in which the relevance of the thesis is discussed. The sentence starts with the notion of the choice of research topic. The adverb 'in itself' is a laconic expression and implies a reservation about the reasons for conducting this research. It is a typical projector of scepticism, anticipating that some problem will occur. The expression 'is fully justified' suggests the possibility that some theses are not fully justified, and implies that this thesis has only just met the requirement of justifiability. The popularity of fasting becomes the grounds for seeing the thesis as justified and reasonable at the end of the sentence. Had the various modes of fasting not been so popular, the thesis would not have been fully justified, but incredible or absurd. The relevance of the thesis comes from the popularity of fasting, not from its scientific relevance or the relevance of fasting as a research topic. Thus the excerpt suggests reservations about the relevance of the thesis.

Argumentation regarding the popularity of fasting and other forms of complementary and alternative medicine (CAM) at the time of the thesis may reflect the claims more widely used to justify attention to unofficial healthcare. For example, the state's Standing Medical Committee began its 1981 report by referring to the growing interest in natural treatments, folk medicine and alternative treatments in all Western industrial societies, which created a need for research into these treatments (SA 1981, 1). Likewise, almost 30 years later, the Ministry of Social Affairs and Health's working group began its 2009 report by stating that the supply, marketing and use of therapies from outside of official healthcare had increased significantly in Finland since 1970 (STM 2009, 13). In the excerpt similar argumentation is

used, and the significance of the research is constructed by reference to the growing use of CAM in society.

Science and technology studies have argued that societal interest groups have a strong role in conflicts between science and society (Nelkin 1995, 455). The appeal to the popularity of CAM use in society as a reason to study these methods reveals the political power of societal interest groups – in this case, healthcare patients – to define what is worth researching. CAM is brought into society by the people who use the treatments, even though its effectiveness has not necessarily been proven by scientific research. CAM as a social movement challenges the practices of official healthcare, creates competition with official treatments, and raises concern over the health of the population (Hess, Breyman, Campbell and Martin 2008, 479).

The opponents' statement also includes argumentation about the relevance of the thesis:

As alternative treatments have increased, so the popularity of fasting has also increased. Thus the choice of theme must be considered topical, interesting and important. (Statement by the opponents Katie Eriksson and Mikael Fogelholm 22.3.1996)

These two sentences are taken from the first half of the opponents' statement, before the list of shortcomings discussed in the previous subchapters. The first few words connect the topic of fasting to alternative treatments. The verb 'increased' is used twice, and it raises the alternative possibility that the popularity of fasting might instead have diminished. The verb generates the impression of the growing popularity of alternative treatments, yet it does not specify the timespan, nor does it define the group of people among whom the popularity has grown. The notion thus takes it as obvious that there has been a growth in the popularity of fasting.

With the adverb 'thus' the popularity of fasting in the second sentence is connected with the choice of research theme. The adverb conveys the meaning that the theme of the research must be considered topical as a consequence of the popularity of fasting. The modal verb 'must be considered' includes the reservation that if the popularity of fasting had not been evident, the theme would not have been topical, but instead would have been uninteresting or insignificant. The verb 'must be considered' is in the passive voice, which does not position the writer as standing behind the words. The

three evaluative adjectives ‘topical’, ‘interesting’ and ‘important’ accentuate the expectation that a thesis should focus on a topic that is currently discussed, attractive and relevant to society. Thus the opponents’ statement notes, with reservations, the importance of the thesis for the population. The evaluation does not directly state that the thesis is interesting, but with some reservations it notes that because fasting is popular, the thesis must be considered important.

Argumentation over the fasting thesis reveals some suspicion towards CAM treatments. Moreover, it presents a willingness to draw a veil over themes of uncertainty, as argued by Ian Hacking in the case of multiple personality disorder in psychiatry (2000, 220). In the excerpts, the research is rooted in the contradictory practices of the population. The argumentation is grounded in the perception that the popularity of and growing interest in fasting among the population is in conflict with professional healthcare practices justified by scientific research, as the population uses alternative practices alongside or instead of conventional medical practices.

It is characteristic of this form of boundary-work between science and society to justify the relevance of fasting in terms of its popularity. The popularity is taken for granted, and is not discussed further. The population in general, and those among whom fasting is popular in particular, are left anonymous and abstract.

The mediation of health by science

The second form of boundary-work between science and society depicts science as making society healthier. The second examination statement argues:

The theme of the PhD thesis is topical in health sciences. Overweight is common in our country, and it is a risk factor for many illnesses. Many citizens participate in different kinds of fasting and other weight-watching courses. Yet scientific research, in our country and also more widely, is scanty. Because health behaviour is in many ways linked with local culture, research in our country is desirable. (Second preliminary examination statement by Osmo Hänninen 10.8.1995)

The statement addresses the theme of the thesis with the evaluative adjective ‘topical’. This highlights topicality as an expected thesis characteristic, and presents this particular thesis as one that redeems

the promise of topicality. The first sentence seems to limit fasting's topicality to the health sciences, but the subsequent sentences reveal a broader view: the issue of topicality is followed by a list of items that add to the relevance of the thesis. The list starts by contextualising the thesis in relation to the Finnish nation. The localisation to Finland creates and emphasises the research theme as a national problem. The expression 'in our country' appears three times in the excerpt, and this accentuates the localisation and creates the impression that the thesis is in line with national health strategy recommendations.

The national health problem presented in the excerpt may relate to the development of national health policy at the time of the thesis procedure. Finland's national health strategy was developed as part of the World Health Organisation's (WHO) programme Health for All. The international programme, first created by the 32 member states of the WHO's European region, emphasised lifestyle as a factor that influences public health and causes health problems. On the basis of international nutritional standards and dietary guidelines, Finland's national Health for All programme was launched in 1986. One of the programme's targets focused on healthy eating patterns with the aim to reduce overweight, which was seen as a cause of many illnesses such as heart and circulation illnesses, diabetes, and attritions of the motor system (*Terveyttä kaikille* 1986, 52, 75, Health for All 1993, ix, 74–77).

The results of scientific research become intertwined with policy guidelines as the thesis gets written into the targets of the national health strategy. The role of research in this argumentation is seen as central, and the thesis becomes one way of establishing the groundwork for improving the health of the population. In the statement, the thesis is contextualised as a part of the national health promotion policy, and thus the thesis is seen as occupying the same territory as other health sciences, which first seek the identification of population health risks and then diminish those risks through scientific research findings. The thesis includes the perception that modern society controls the future by identifying future risks and threats, and hope is placed in science as finding solutions to those risks (Väliverronen 2004, 366, 373).

The list of the factors that increase the relevance of the thesis points out the prevalence of overweight, which is introduced as an endemic health problem. After presenting the prevalence argument, the statement says that overweight is a serious risk factor for the

population. The risk consists of overweight as a cause of illness. The quantification with the adjective 'many' in front of 'illnesses' abstractly quantifies the number of illnesses and generates an impression of certainty over the element of danger. Both overweight and risk factors act in the excerpt as indicators of a problematic situation which is also presented as a nationally topical threat, and this emphasises the significance of the thesis in its attempt to solve such a large problem. The excerpt then continues by presenting the multitude of citizens who take fasting and weight-watching courses. The adjective 'many' again generalises the issue and adds to the impression of citizens pouring onto the courses on which slimming advice is given. The excerpt takes advantage of the existence of a practical social problem, overweight, which is presented as a threat to Finnish society, and science in the form of the thesis is seen as confronting the risk and helping to actively shape the future of a healthier and less fat Finnish society.

The conjunction 'yet' contrasts with the thesis's great social relevance by presenting scientific research on the topic as rare. The rarity of scientific research is further specified with the evaluative adjective 'scanty', which reflects the expectation that research on such a significant health problem would be plentiful and wide-ranging. But the expectation is not fulfilled, and unsatisfactorily few research projects are conducted on the topic; the overweight problem is presented as insufficiently addressed by research.

The expression 'in our country' in connection with the lack of research again stresses the urgency of the local problem and accentuates the need for research to answer the problem locally. Furthermore, the expression 'more widely' emphasises the absence of research on this topic in general, and suggests that this is a common international shortcoming. The last sentence returns to the connections between health behaviour and the national and local cultures with the expression 'in many ways', which abstractly quantifies those connections and gives an impression of the generality of the links between health behaviour and local culture. This emphasises the significance of the thesis in a problematic situation, from the point of view of this particular context. The last word of the excerpt, 'desirable', is an evaluative adjective implying hopefulness that the thesis will ameliorate health problems and help the nation to solve them. The word 'desirable' also presents the hope for an increase in the number of research projects similar to the thesis.

Another excerpt from the second statement continues:

The intervention of fasting led to the reduction of the use of healthcare and alternative services. Likewise the consumption of coffee, dietary fats and salt, plus health food. Smoking of tobacco also reduced. However, not all of the health aspirations and attempts to change habits came true.

The fasting course seems to create a favourable ground for changes in lifestyle. (Second preliminary examination statement by Osmo Hänninen 10.8.1995)

This excerpt is taken from the latter half of the statement. The word ‘intervention’ at the beginning bears a connotation of medical practices in which actions are taken to influence the health status of an individual or group of individuals. An intervention is an action that interferes in the course of a phenomenon, and this connects the excerpt to the way in which theses are evaluated in medicine: the quest is for strongly proven evidence for the efficacy of the intervention, be it a medication, a surgical operation or a change in eating or other habits. The excerpt lists the proofs for the efficacy of the fasting intervention described in the thesis.

The list consists of seven proofs: the reduction of the use of healthcare services, the reduction of the use of alternative care services, and decreases in the consumption of coffee, alimentary fat, salt, alternative products and tobacco. The many elements in the list imply that sufficient evidence for the good effects of fasting has been gained in the thesis. The list uses both the words ‘reduce’ and ‘reduction’, which highlights the importance of the decreases in the health behaviours in question. The last five of the proofs are presented as sentences with no subject, a tool that is used in order to be convincing and to present the intervention of fasting as generally applicable to a wider population.

The list of proofs of the efficacy of fasting justifies the research and presents the thesis as a successful piece of research leading to solutions for the undesired health behaviour of the population. The next sentence, by contrast, contains a negation: ‘not all health aspirations and attempts... came true.’ The extreme expression ‘all’ indicates that neither fasting nor any other intervention meets all the hopes and desires of the population. The notion implies that one piece of research is not able to solve all problems, which makes the immensity of the problems more understandable and emphasises that

the thesis makes a contribution to the attempts to solve them. The excerpt in this way holds onto the expectation that one piece of research is not enough to guarantee relevance. Instead, in order to validate the findings, the research should be supported by several separate research projects.

The last sentence of the excerpt is more reserved about the effects of the fasting course. The modal verb 'seems to create' conveys that it has been proven with some reservations that a fasting course can create a basis for changes in lifestyle. The metaphor 'favourable ground' creates the impression that the fasting course constitutes quite a significant contribution to the solving of health problems. Together with other things, fasting can be a part or a building block in the attempt to respond to the need for change in the population's health habits. This constructs the efficacy of fasting as partial – not solving the whole of problem, but making a good contribution to the process of doing so.

The evening news broadcast presents the relevance of the thesis in multiple ways. The excerpts below are transcribed from a news item lasting three minutes. The item consists of an introduction by the newscaster, a summary of the research findings by the reporter, interviews with people who have recently fasted, and an interview with the doctoral candidate. The relevance of the thesis is discussed in the introduction by the newscaster and the summary by the reporter:

[Introduction by the newscaster] Fasting has been scientifically discovered to be healthy. A week's fast improves cholesterol levels and makes the mind fresher. Fasting was not found to disadvantage health. The first doctoral thesis on fasting was examined today in Tampere.

[First summary by the reporter] The effects of fasting have been publicly defended for the first time in Finland. Science proves that a week's fasting and bowel rinsing will not kill you, at least if you have been spared from serious disease.

[Second summary by the reporter] In the research project there were 161 fasting individuals and the same number of persons continuing their gluttonous ways. According to the research, the fasting individuals started to live more healthily, their self-image improved and their discomfort diminished. (Evening news: TV news bulletin by newscaster Arvi Lind and reporter Vesa Perälampi 22.3.1996)

The adjective 'scientifically' gives the impression of strong evidence for the healthiness of fasting. The verb 'discovered' implies that something genuinely new has been found through the research. The first sentence connects the evening news to the genre of health news, in which scientific proofs and new discoveries about human health are assets. Then two good effects of fasting are briefly presented, which establishes the credibility of the thesis. The negation 'not found' hints at the possibility that the research could have discovered that fasting harms health, and presupposes a situation in which fasting is unhealthy. The negation thus contrasts the possible unhealthy with the healthy effects of fasting. Altogether the introduction presents the thesis as making a new scientific discovery which provides a healthy and safe way to improve one's physical and mental condition.

The first summary emphasises the novelty value of the thesis, as it presents the research as the first to study the effects of fasting in Finland. 'Effects' belongs to a vocabulary familiar from experimentation, and creates a feeling of the impressiveness of the thesis. The expression 'science proves' implies that the discoveries made by the thesis are independent of the person who has announced them, and that the facts speak for themselves. Science is viewed as an abstract but active social actor that is able to prove some things as false and others as true. The researcher is elided, and the effects of fasting become undisputable facts. The negation 'will not kill you' conceals an expectation that fasting might be fatal and especially that a week's fast might have serious effects on health, thereby creating an impression of the harmlessness of fasting.

The mention that some things 'kill' is an extreme expression, and as such it ridicules counterclaims about fasting and implies that the idea that death is connected to fasting is absurd. The wording has connotations of the Finnish saying 'if spirits, tar and the sauna do not help, then the disease is about to kill you', thereby linking fasting to folk shibboleths, and the thesis is presented as proving them incorrect. The adverb 'at least' entails the notion that there are limitations to the positive effects of fasting: persons who are seriously ill cannot fast. The diseases are not specified, which implies broad-mindedness and also strengthens the ironic attitude towards the idea that death is connected to fasting.

The second summary starts with the research participants, the individuals who fasted and those who did not. The exact number of participants quantifies the research and presents it as incontrovertible

knowledge. The reference to the gluttony of the non-fasting individuals has a connotation of greedy and luxurious eating, even though the opposite of fasting is not necessarily overeating; rather, the opposite of fasting is a normal diet. However, producing a connotation of overeating presents fasting as a reasonable and healthy habit. Fasting is often considered something that is unusual and uncommon, but the connotations of greed in the excerpt (counter-)produce the normality of fasting.

The last sentence of the second summary gives a list of three positive effects of fasting that emphasises the manifold nature of the evidence that fasting can be used as a method for a healthier life. The first item, 'live more healthily', links the research with lifestyle and health education. The second, 'their self-image improved', links the research to psychology and psychical well-being. The last item, 'their discomfort diminished', refers to the resolution of health problems by medicine and in the patient-doctor interaction. The argumentation of the second summary normalises the method of fasting in the thesis and presents its multidisciplinary contribution to many aspects of human health.

The local newspaper article discusses the relevance of the thesis:

A week's fast increases well-being and health [headline].

Finland's first scientific investigation of supervised fasting has been completed in Tampere [strapline].

Supervised fasting has been analysed scientifically for the first time – apparently in the whole world – and the results are highly affirmative: participants' mood rose, self-image improved, performance increased, and medical measurements headed in the right direction. (Kangasniemi, Seppo 1996. Report. *Aamulehti* [*Morning News*], 23.3.1996)

The headline in the local newspaper article includes the evaluating verb 'increases', which connotes the desirability of well-being and health. The first sentence refers to the thesis title, 'Health and well-being through fasting', and thus implies that the article agrees with the thesis. The novelty value of the thesis is emphasised by presenting it as the first scientific research on fasting in Finland. This argument is repeated in the second sentence, which presents the thesis as groundbreakingly having found new aspects of healthy living, and

which also suggests that the thesis might be the first scientific research on the topic in the whole world.

The local newspaper article mentions different places – Finland, Tampere, the world – and this both localises the thesis and draws attention to its national, regional and worldwide impact. Naming the city of Tampere demonstrates that the thesis is a local achievement and gives the impression that the article belongs to the genre of local news, in which the location of the newspaper offices gives special value to the issues discussed. The notion indicates that readers are expected to be interested in research conducted locally. The phrase ‘apparently in the whole world’, supported by dashes, is an extreme expression, maximising the character of the thesis as a worldwide breakthrough and as genuinely new, and highlighting its impressiveness as a forerunner in the field of science. The connotation of a worldwide breakthrough also generates the impression that the groundbreaking nature of the thesis is indisputable, and justifies the attention given to it in the local newspaper.

The repetition of the word ‘scientific[ally]’ constructs the value of the thesis as a scientific accomplishment and implies that its output is positive from the point of view of science. The evaluative adjective ‘affirmative’ implies that previously there have been doubts about fasting, but as a consequence of this research those doubts are no longer relevant. Instead, the adjective ‘affirmative’ draws attention to the research’s positive results. The affirmation is strengthened by the adverb ‘highly’ in front of the adjective, which smooths away the doubts even further and generates an impression that the results are exceptional.

The use of the noun ‘results’ connotes that research that is conducted within a specific research setting and that either validates or invalidates the setting is a desired outcome. The setting is presented as supervised fasting and the results as positive health effects, illustrated by a list of four items highlighting the different disciplinary perspectives in the thesis. The first two effects in the list are improvements to mood and self-image, which are improvements in psychological well-being. The third issue, performance, refers to physical condition, muscle tone and fitness, which are considered results of a good lifestyle and link the research results to healthy living achieved through health education. The reference to medical measurements identifies these results as representative of the scientific discipline of medicine. Thus in the article the only discipline named is

medicine, which demonstrates that research credibility is generated by mentioning a strong, established discipline and by not specifying the disciplines of psychology and health education, even though they can be identified from the text. The area of nursing science is non-existent in the article, even though it was the discipline within which the thesis was defended.

The national newspaper article states:

Fasting reduces troubles and unburdens the mind. The first public defence on a thesis in the field acclaims supervised fasting [headline].

A healthy person can easily go for a week on plain juice or sprouts, including at work. Troubles are decreased, one's mood improves, and so does physical performance. Fasting energises, and one's self-image gets better. For many it is also the start of a healthier life and weight loss, because a fasting week weans one from tobacco, coffee and pastries. For her doctoral thesis the licentiate Helena Frankberg-Lakkala, aged 63, analysed what happens to the human mind and body during a supervised fast. 'Health and well-being through fasting' is the first scientific report on supervised fasting in Finland. (Hyvärinen, Irja 1996. Report. *Helsingin Sanomat* [*Helsinki News*] 21.3.1996)

The headline emphasises the societal implications of the thesis for the health of the population. The physical term 'troubles' and the psychological term 'mind' indicate the impact of fasting on health. The third and fourth sentences of the excerpt also highlight an increase in physical and psychological well-being through the fasting method. The text builds on the good effects of fasting for both body and mind, as summarised in the penultimate sentence.

The third sentence draws attention to fasting as a method that can be also used while at work, which implies an expectation that fasting or other methods of healthcare are so time-consuming that one would not be able to use them while at work. However, according to the excerpt, the thesis contradicts this expectation and instead proves that, thanks to the endurance of the human body, fasting can be applied while at work. The adjective 'plain' in the same sentence connotes the difficulty of carrying out fasting and the expectation that one would not be able to function at work on such a small amount of energy. The adjective effectively denies this expectation and generates a success story about people who drink only juice or eat only sprouts and survive during working hours. These notions also act to normalise

the fasting method as viable while at work and as a part of the daily routine.

The national newspaper article raises another aspect of social relevance in the sixth sentence. Fasting is presented as the start of a healthier lifestyle. The sentence starts with the quantifying word ‘many’, which implies that fasting is applied by many. Abstractly leaving the exact number unspecified, but still suggesting high numbers, the word ‘many’ in the excerpt indicates that many users have benefited from fasting. The noun ‘start’ connotes a new beginning in another kind of reality, or a developmental step on the path of struggle with one’s health issues. This noun implies development, a move away from the previously unhealthy habits and lifestyles that cause obesity, and as such it acts as a metaphor implying a better future life. The new lifestyle is then defined through a list of three bad habits that fasting can break. The list includes tobacco, which implies the reduction or cessation of tobacco use as an ideal for healthier living. Coffee refers to the reduction of the use of stimulants as a standard for this healthy living agenda. Pastries connote overeating as a bad habit, and provide an example of food that does not belong to the new healthy diet that will be started after fasting.

The national newspaper article emphasises that the thesis is the first on the topic in Finland. This is done both in the headline and at the end of the article, and thus the novelty value of the thesis is highlighted. The article focuses on the social significance of the thesis; however, its scientific significance is briefly referred in the phrases ‘the first public defence on a thesis in the field’ and ‘the first scientific report on supervised fasting in Finland’. These notions generate an impression of the novelty value of the thesis. Lastly, the article localises the impact of the research in the Finnish scientific community.

The news items analysed demonstrate straightforward praise of the thesis. The excerpts do not use modal verbs like ‘should’ or ‘could’ that question the value of the research results or imply expectations of failure with regard to the fasting method. Moreover, the excerpts use the power of the media to present the thesis entirely in a positive rather than a negative light. The audience is the general public, and fasting is presented to them as an unquestionably good method for achieving good physical and mental health. Media researcher Esa Väliaverronen (2004, 363, 369), who has studied media representations of science, uses the term ‘promise discourse’ in relation to media

stories that seek to produce hopeful representations of science in relation to the future and high expectations for the social, political, cultural and economic benefits of science. The news stories about the fasting thesis draw on the social implications of fasting and present the expectation that administering a healthy living agenda through fasting will yield benefits for human health. The news items make promises for physical and psychological well-being, and thus legitimate the use of fasting interventions in obesity treatment, health promotion and mental healthcare.

Rae Goodell (1987, 593–594) has pointed out the lack of criticalness in media writing about science and science writers' selectivity in their choice of informants for news stories. The sociologist Alan Petersen (2001, 1257, 1258), who specialises in the sociology of health and illness and the interaction of the media with biosciences, has also pointed out that journalists do not necessarily have the skills to critically evaluate research and do not automatically cross-check information with third parties. The media representation of the fasting thesis's findings mediates the story formulated in the thesis, and depends directly on the doctoral candidate's formulations, such as the thesis title 'Health and well-being through fasting'. Thus the media popularises the breakthrough message of the thesis, and the alternative treatment of fasting becomes a media *cause célèbre*, or at least is represented as unquestionably true new knowledge.

It is characteristic of this form of boundary-work between science and society to argue about the power of science to solve health problems in society. The health effects are listed, and their relevance for improving health is presented. Science is seen to mediate health for society using a passive voice, and the actors are the population of Finland and even the world.

The profitability of science

The third form of boundary-work between science and society, which presents the profitability of fasting, appears in the response article by the doctoral candidate. In one sentence she argues:

Research proved that a supervised fasting course is an easily feasible and, in terms of cost, affordable method of healthcare. (Frankberg-Lakkala, Helena 1996. Comment on the article "Does fasting work after all?")

Suomen lääkärilehti [Finnish Medical Journal] 20–21/1996, 2175, and Hyvä Terveys [Good Health] 6/1996, 64)

The expression ‘easily feasible’ conversely suggests that some healthcare methods are less feasible, and gives the connotation that the healthcare system is difficult to access and poorly organised. The sentence implies that healthcare can only be attained within certain time limits and organisational arrangements. One gets the impression that fasting can easily be applied by people themselves in their own homes, rather than by having to enter an organisational or institutional context. The evaluative phrase ‘in terms of cost, affordable’ hints that, by contrast with the affordability of the fasting method, at the other extreme there are expensive methods in the healthcare system that use costly technology. Through this phrase fasting is marketed as affordable and applicable to ordinary people, and the healthcare system is presented as expensive and not easily accessible. This creates an impression that fasting cuts the costs of healthcare, even though the latter includes expenses that would not be affected by the use of fasting.

The argumentation about the profitability of the fasting method may reflect the financial situation in Finland at that time and the economic constraints on public healthcare. The problems and challenges of maintaining the ideals of the national Health for All programme, launched in 1986, were discussed in a updated version of the programme in 1993 (*Terveyttä kaikille 1993*, 16–19). The deep economic recession at the beginning of 1990s in Finland necessitated a reconsideration of the programme targets. The updated programme directed attention to the prioritisation of healthcare services and suggested a switch in focus from treatment to prevention. Moreover, the updated programme suggested a broad-based policy interlinking healthcare with nutrition and physical exercise policies targeted at preventive care. The argumentation over the economic profitability of the fasting method may therefore reflect the policy environment of the time, distinguishing expensive public sector healthcare costs from cheap private self-care.

Health sociologist Tuula Vaskilampi (1992, 16–17), who has studied the role of CAM in the Finnish context, argues that CAM operates in the private non-profit or profit sector, outside of public, organised and official healthcare. In the argumentation by the doctoral candidate, science is used to draw a contrast between public

healthcare, which has connotations of expensive public organisations and rigid bureaucracy, and private healthcare, which is associated with cheap, loosely organised and easily accessed self-help. The role of science in this argumentation is seen as broadening the area of private healthcare and simultaneously promoting the choice and responsibility of the individual. Science becomes profitable for society and an active agent in the process of reducing public healthcare costs, because science can identify cheap treatments that help to prevent health problems. Therefore, scientific research is seen to have strong social implications.

The sentence containing the expressions ‘easily feasible’ and ‘affordable’ begins by distancing the researcher with the abstract statement that ‘research proved’. The writer becomes an announcer in the background of the research, merely delivering the research message, even though she actually wrote the thesis herself. The illusion is generated that fasting is an easy and cost-effective method of helping society to cope with the increasing expenses of modern healthcare, but for the purposes self-protection evasive action is taken to neutralise the argument and avoid any criticism that the researcher would have to respond to herself.

This form of boundary-work between science and society can be characterised as presenting science as profitable for society. Reduced costs and easy accessibility are the main arguments regarding profitability.

Nursing science in the boundary-work between science and society

The boundary-work between science and society in the conflict over fasting presents the relevance and profitability of research for society. It highlights the social, political and economic benefits of science. In the excerpts, a PhD thesis in nursing science is depicted as beneficial, independently of the discipline of nursing science. Rather, the boundary-work seems to relate to the popularity, health effects and social savings to be gained through CAM. Science has a role to authenticate alternative treatments and make them acceptable to society.

Boundary-work between science and society is done in the field of nursing science independently of any representatives from the

discipline itself. Nursing science is viewed from the outside by examiners from other disciplines, the doctoral candidate and the media, and nursing science does not have a role in these definitions. Therefore boundary-work gets done without any argumentation over nursing science, and without using nursing science as a bridge to connect different institutional, societal and cultural fields. Nursing science is invisible, and thus the boundary-work between science and society reinforces the invisibility of the female sphere of nursing and nurses in the media and even in the healthcare system, as suggested by Ann Oakley (1993, 39, 50).

The disciplines of the thesis are not discussed in this form of boundary-work. The only discipline mentioned is medicine, and the relevance of the thesis's results is presented in terms of physical and mental health from the point of view of medical expertise. The psychological effects are mentioned and the benefits for health education are acknowledged, but attention is not given to the practice of nursing or the field of nursing science, even though the thesis was completed in nursing science. In the argumentation there exists no independent nursing science message, and medicine is used as a reference point.

Boundary-work between science and other knowledge systems

This subchapter focuses on the boundary-work between science and other knowledge systems in the conflict over fasting. This boundary-work was found to take three forms: contrasting the natural science world view with other knowledge systems, contrasting the nursing science world view with the natural science worldview, and demonstrating the controversiality of alternative treatments. The argumentation was found in the *Sceptic* article, the *Sceptic* editorial and the *Sceptic* response.

Contrasting the natural-science world view with other knowledge systems

The first form of boundary-work between science and other

knowledge systems contrasts the natural-science world view with other knowledge systems. This was found in the article in *Sceptic*, the journal of the scepticism movement. The article consists of five direct quotations from the thesis and a text summarising the thesis's findings. Here only the quotations from the thesis will be scrutinised. The quotations are not explicitly referred to in the article, but in the context of a journal of the scepticism movement, they are understood as demonstrating claims that for some reason are of interest to *Sceptic* readers. The aims of the scepticism movement are to encourage critical thinking, to promulgate the principles of scientific research, and to enhance the scientific analysis of disputed and exceptional claims (Skepsis 2013). The quotations are not analysed here as part of the thesis, but as demonstrations of violations of critical thinking and scientific principles, or presentations of disputed or exceptional claims, targeted at the audience of *Sceptic*.

The presentation of quotations starts with this excerpt:

Fasting is a complete or partial abstention from nutrition during a limited time for religious or health reasons. The habit of fasting is widely known among different cultures and religions, sometimes a cult-like preparation, sometimes an expression of sorrow when commemorating a dead person or after an accident. (Raivio, Sinikka 1996. What are the reasons for fasting? *Skeptikeko* [*Sceptic*] 2/1996, 27–28)

This quotation enumerates three general types of reason for fasting: religious, health and cultural reasons. The health reasons are not specified in this excerpt, but the religious and cultural reasons for fasting are presented more fully in the second sentence. The religious and cultural reasons are stated to be related to preparations for religious events, commemorations of the dead, or accidents. These reasons are strengthened with the expression 'widely known', producing an impression of the prevalence of the use of fasting in different cultures which simultaneously elides the possibility that fasting is rare as a treatment. Thus the thesis is connected to religion and cults, representing aspects of culture – religion and cultural beliefs – that do not belong to the scientific world view.

The quotation demonstrates that the thesis panders to the supernatural and transcendental, and this is implicitly contrasted with reliance on the results of a scientifically sound analysis of fasting individuals. The quotation generates the effect that the boundary between religious belief and scientific rationale, which should be kept

separate, has been breached. It demonstrates that the rule separating the religious from the rational has been broken.

The quotations continue:

Fasting invokes abandonment psychology and is a very strong experience... It extends from physical functions to mental-spiritual dimensions. (Raivio, Sinikka 1996. What are the reasons for fasting? *Skeptikko* [*Sceptic*] 2/1996, 27–28)

The quotation refers to ‘abandonment psychology’, which, although it names the scientific discipline of psychology, implies a colloquial understanding of psychology as lay knowledge about human nature and social relations. The evaluative adjective ‘very strong’ in front of the term ‘experience’ indicates that the thesis relies on anecdotal evidence or accounts and odd examples, and that it is based on individual feelings, even though (according to the tenets of scepticism) knowledge should be produced in a manner that is not dependent on individual demands or wishes. ‘Mental-spiritual dimensions’ suggests a relation to parapsychological phenomena that cannot be explained within a natural scientific framework. The continuum presented from physical functions to mental dimensions connotes the holistic understanding of the human being used in CAM, which claims to take into account all aspects of the human being.

Communication researcher Per-Anders Forstorp (2004, 52), who has analysed the Swedish scepticism movement, writes that one of the characteristics sought by sceptics is the use of odd examples and particularities instead of statistical sampling and experimental methodology. The thesis gets connected to lay knowledge and odd examples that are considered to be individual experiences and particularities, whereas the scientific world view should be universally applicable to different situations. It is shown that the thesis violates the rule of systematic knowledge production and instead uses odd examples. Therefore the *Sceptic* article presents the thesis as conflicting with the rule that universal knowledge is to be preferred; instead it is demonstrated to rely on particular knowledge.

The quotations go on:

The courses for revitalising the body and fasting are not new discoveries of our time. In the Bible there are at least 100 mentions of fasting. It was conducted more for mental-spiritual than for health reasons.

In historical times the magical, ethical or religious background of fasting was emphasised. Nowadays people who fast are those who are more interested in their health than the average. (Raivio, Sinikka 1996. What are the reasons for fasting? *Skeptikeko* [*Sceptic*] 2/1996, 27–28)

The first sentence generates an impression that fasting was discovered a long time ago. The excerpt presents fasting as a traditional method, rooted in the past but still having continuity and relevance today. The second sentence refers to the Bible and demonstrates that the thesis places faith in an unscientific authority, which has been identified by Forstorp (2005, 52) as one of the negative indications used in the scepticism movement's normative method for identifying pseudoscience. It also exemplifies the use of an unscientific and obsolete source connected with religion, rather than the scientific and up-to-date sources expected of a scientific thesis. The excerpt presents the use of this type of source as common and easily found in the thesis. The third sentence contrasts historical fasting with modern fasting, and religious fasting with fasting conducted for health reasons. Thus the thesis gets connected with magic, ethics and religion.

In these excerpts historical times are associated with mental and religious motivations for fasting, whereas modern times are associated with health motivations. However, the possibility of religious and mental motivations today is not excluded, and this generates an impression that mental and supernatural aspects can also be associated with modern fasting. This generates a space in which to contrast the inherent beneficiality of modern science, valued by sceptics (Forstorp 2005, 68), with traditional and magical beliefs. This demonstrates a blurring of the boundaries between the scientific and the magical in the thesis. The excerpts illustrate that the thesis relies on outdated religious and unscientific sources and motivations for fasting, and contrasts these with sceptical thinking, which requires a dependence on scientifically proven facts rather than on religious and supernatural beliefs and perceptions. The excerpts as a whole indicate violations of the boundary between science and magic as well as that between science and religion. The distinction between the traditional and the modern also gets blurred.

The last quotation states:

Postmodern society can offer postmodern health services. Alongside rational natural scientific knowledge, people are waiting and longing for experiences, emotions and miracles that make everything possible, and

they have a need to believe in them. The market share of alternative treatments is growing. The fasting individuals in this research declared that their goals had been achieved. They perceived fasting as a strong experience, which was described by some of the participants with the word 'miracle'. This is something that cannot be described through concrete numerical research findings alone. (Raivio, Sinikka 1996. What are the reasons for fasting? *Skeptikko* [*Sceptic*] 2/1996, 27–28)

The excerpt uses the concept 'postmodern' twice, and thus presents present-day society as a pluralistic community of heterogeneous groups with diverse cultures, lifestyles and values (Thomas and Walsh 1998, 364). Postmodernity may represent a blurring of the homogeneous methods of science, and act as an example of multidirectionality rather than obedience to the strict principles of scientific research. The thesis appears to have been misled by diverse cultural aspects rather than remaining within the limits of separable scientific reality.

In the second sentence, postmodern knowledge is classified as knowledge that highlights experiences, emotions and miracles, and rational natural scientific knowledge as knowledge in which experiences, emotions and miracles are not included. The second sentence demonstrates a violation of the principles of the rational natural sciences' and an attempt to mix experiences and emotions with the natural-science agenda. The sentence illustrates the use of free thinking characterised by individual experiences, personal emotions and supernatural marvels that have no substance as regards natural scientific reasoning.

The third sentence associates postmodern society with growing alternative treatment markets. Through the use of the term 'market share', the other party involved in health services, i.e. public health services, is presented as diminishing, while alternative treatments are seen as expanding. This sentence is separate from the argumentation before and after it, only loosely attached to the theme. However, it introduces a new aspect, arguing that there has been an expansion of alternative treatments in society. As the text is an article in a scepticism journal, this sentence points out the disconnection between the thesis and the natural scientific world view. The growing market share of alternative treatments stands in for an argument that values treatments outside the scientific sphere and thus crosses the boundary of rational science, instead invoking irrational thinking. Thus in the

context of a scepticism journal this argument constructs the boundary line between the rational and the irrational, science and belief.

The last lines refer to the fasting research participants, and directly to their experiences. These experiences are contrasted with the quantitative research principles that require measurements and numerical research results. 'Experiences' blurs the boundary between generalisable knowledge and emotional knowledge linked to a particular occasion. The argument also exemplifies the thesis's transgression of the sceptics' natural scientific world view. The word 'miracle' in a scepticism journal connotes magic that may be impossible to see through the sceptics' natural-science lenses and that thus violates the boundary between magic and science. It breaks the rules of rational thinking and rests on magical evidence, instead of the evidence purified of beliefs and personal experience that is demanded by scepticism's principle of cleanliness (Forstorp 2005, 30).

The quotations demonstrate the thesis's violations of the principles of scepticism. Forstorp (2005, 65–66) argues that the scepticism movement can be characterised by a strong natural scientific world view and the endorsement of this world view as the norm for science in society. Science in the quotations is seen through the lenses of sceptical thinking and the norms of natural science. The quotations demonstrate the separation between science and religion, reason and magic, the particular and the universal, the traditional and the modern. The power of *Sceptic* is used to stigmatise the thesis as violating the rules of scepticism. The article adheres to mainstream Western scientific traditions, and the research represented by the thesis is placed outside these traditions.

The anthropologist Laura Nader (1996, 2) argues that Western science has produced hegemonic categories by powerfully contrasting science with other knowledge forms. It is characteristic of this form of boundary-work between science and other knowledge systems to demonstrate that the thesis differs from the natural-science world view and instead can be connected with other knowledge systems. The quotations present the nursing science thesis from the point of view of the natural sciences. Nursing science as such is not evaluated or argued over through the quotations. The nursing science thesis is used as a medium to enhance the sceptics' scientific world view and to nullify other types of research.

Contrasting the natural-science world view with the nursing science world view

The second form of boundary-work between science and other knowledge systems contrasts the natural-science world view with the nursing science world view. This form appears in the *Sceptic* editorial. The *Sceptic* editorial argues:

As I write there is a seminar taking place (22–24.11.96) in the monastery in Valamo, the theme of which is ‘Psychology, religion and spirituality’. The seminar aims to discuss ‘whether the humans of our time are ready to accept the human spiritual dimension as part of the psychological and nursing scientific view of the human being’. The seminar has been organised by the Finnish Association for Mental Health together [sic] with Valamo Folk Secondary School. (Ollikainen, Marketta 1996. From the editor. *Skeptikko* [*Sceptic*] 3/96, 7)

The editorial starts by saying that as the writer was completing the article, she became aware of a seminar on ‘Psychology, religion and spirituality’ being held in an orthodox monastery. The aim of the seminar was to discuss ‘whether the humans of our time are ready to accept the human spiritual dimension as part of the psychological and nursing scientific view of the human being’. This sentence is in inverted commas, which indicates that it is being quoted directly from the seminar programme or bulletin. The question contains the expectation that one day in the future, the spiritual dimension will be included in the domains of psychology and nursing science.

The question ‘whether the human...’ categorises a) people who are ready, which means that they incorporate spiritual dimensions into the views of the human being in these specific fields, and b) those who are not ready in the sense that they do not include spiritual dimensions in their view of the human being. The expectation that the spiritual should be included, and the categorisation in the question of people as ready or not ready, are indicators of perceptions that are not included in science. Thus psychology and nursing science in this excerpt are presented as breeding grounds for potential violations of the rule separating science from religion.

The groups organising the seminar are presented: an orthodox monastery, a monastery training centre and a non-governmental organisation. The first two are closely collaborating religious institutions which aim to provide centres for meditation and prayer in

orthodox Christianity. The third group is a joint association of patients and professionals, mainly comprised of individuals who are interested in supporting mental-health patients and in increasing the awareness of mental-health issues in society. These groups are potential evidence of the close collaboration between belief systems and the scientific fields involved, i.e.. psychology and nursing science. The reference to these groups implies a mixing of religious ways of thinking with scientific reasoning, and thus adds to the impression that their organising the seminar was a violation of the boundary between science and religion.

The seminar is just one example of the violation of the boundary between science and beliefs. The editorial continues with a second example, examining the view of human beings and holistic nursing in the book *Therapeutic Touch* by Anja Rautajoki. Thus the editorial links the conflict over fasting with the conflict over therapeutic touch. This is the only time they are mentioned together, even though they occurred in close temporal proximity. The section concerning therapeutic touch will be analysed later. The *Sceptic* editorial continues:

Is there now taking place in the so-called human sciences some kind of fundamental reversal of direction, the testing ground of which is the youngest of the disciplines, nursing science, or what is the issue here? Recently in the spring a doctoral thesis in nursing science, *Health and well-being through fasting* by **Helena Frankberg-Lakkala**, was accepted, even though it did not, according to the opponents, meet the scientific criteria for thesis work. (Ollikainen, Marketta 1996. From the editor. *Skeptikko* [*Sceptic*] 3/96, 7)

The question ‘is there...?’ suggests a turning point, a reversal of direction in nursing science. The metaphor ‘reversal of direction’ generates the effect of a complete change in the nursing science world view and in the field’s scientific criteria. The evaluative adjective ‘fundamental’ strengthens the impression of profoundly changed criteria in nursing science. The reversal metaphor implies the potential inclusion of unscientific elements in the nursing science world view. Thus the question with which this excerpt begins produces proof of the infringement of the boundary between science and magic.

The effect of infringement is strengthened by another metaphor, ‘testing ground’, which has connotations of a technical prototype or a natural scientific setting in which a new species, application or innovation is tested. The excerpt presents nursing science as a

breeding ground for a new kind of scientific criterion, at this stage exemplified by the breaking of the boundaries between science and magic and also science and religion. The superlative ‘the youngest’ creates a disciplinary chronology in which nursing science is depicted as the youngest of disciplines. The other disciplines in this chronology are not specified. The position of nursing science as the youngest of the disciplines is stated as if it were obvious. The question ends with the open rhetorical question ‘what is the question here?’, expressing suspense and incredulity over the reversal of direction in nursing science. The final question also opens up the possibility that the reversal has been misinterpreted, and calls for an answer to correct the interpretation.

The list of examples is continued in the second sentence, starting with the evaluative adverb ‘recently’, which generates an impression of repeated violations of the boundary between science and magic. The three examples – the seminar, the book and the thesis – demonstrate the continuity of the violations. The negative statement about the sentence indicates that the expectation that a thesis should fulfil scientific criteria was not met in the conflict over fasting. The thesis is presented as belonging to the field of nursing science, which in the preceding sentence is described as a young discipline and a testing ground. The style of the excerpt evokes the interest and surprise of the *Sceptic’s* reader by mentioning cases that exemplify the neglect of scientific criteria. The phrase ‘according to the opponents’ emphasises the opponents’ authority in the thesis assessment procedure, and generates the impression that contrary to expectations, the thesis does not meet the scientific criteria for thesis work.

Forstorp (2005, 30) argues that the scepticism movement can be characterised by its strong desire to safeguard the cleanliness of science against dubious elements and its unwillingness to understand these external elements. In the excerpts, nursing science is produced as a young discipline in which new scientific criteria can be tested and through which dubious elements can infiltrate the sphere of science. The argumentation stresses fundamental changes in the direction of nursing science. The readers are made aware of the boundaries that seem to be broken in the field of nursing science. The perplexed question about the meaning of all the changes in nursing science warns the *Sceptic’s* readers about the threat being posed to the cleanliness of science.

It is characteristic of this form of boundary-work between science and other knowledge systems to present the nursing science world view as different from the natural-science world view. The *Sceptic* editorial by the journalist from the scepticism movement stigmatises nursing science as failing to apply scientific methods and high standards of ethical criteria. The discipline is presented as breaking the boundaries between science and magic, spirituality and religion. The editorial constructs nursing science as a discipline that is in its youth and is having problems defining scientific criteria, and thus as having difficulty in joining the natural scientific community that is promoted by the scepticism movement. The nursing scientific world view is constructed through the presentation of three incidents as evidence of a fundamental change in nursing science's perceptions, and these incidents are used to characterise nursing science as a scientific discipline.

Controversial alternative treatments

The third form of boundary-work between science and other knowledge system demonstrates the controversiality of alternative treatments. The doctoral candidate defends her thesis in the *Sceptic* response:

Fasting belongs to the sphere of alternative treatments, and the theme was naturally controversial in more ways than one. The University of Tampere's department of medicine accepted it as a topic for research. The department is sufficiently eminent that it will not accept a thesis if it does not meet the criteria demanded for scientific work. (Frankberg-Lakkala, Helena 1996. A response to the article "From the editor" in *Skeptikko* [*Sceptic*] 3/96.' *Skeptikko* [*Sceptic*] 1/97, 38–39)

The first sentence includes the expression 'sphere', which presents the research as belonging to a specific domain, that of alternative treatments. The categorisation of the thesis within the domain of alternative treatments explains the critique in the editorial and produces the controversiality of the thesis as self-evident, since the research topic belongs to the category 'alternative treatments'. The notion also demonstrates the candidate's awareness of the boundaries between academic medicine and alternative treatments, and thus indicates the consciousness and meticulousness of the author.

The adverb ‘naturally’ in front of the adjective ‘controversial’ indicates that controversy in connection with alternative treatments is a generally accepted and expected fact, and that it is commonly used in the scientific domain to distinguish scientific knowledge from other forms of knowledge. This normalises the controversial and presents it as mundane argumentation about alternative treatments. This notion produces the acceptability of the controversial theme and demonstrates that the doctoral candidate is on the side of critique. Admitting that fasting is controversial establishes the acceptability of the thesis in both the scientific and the alternative spheres and does boundary-work in both directions, because the notion categorises the research within a sphere associated on the one hand with fraud and gullibility, and on the other with academic meticulousness and scientific criticism. This defends the author from criticism from both sides. The text then quantifies the controversiality of the theme with the expression ‘in more ways than one’, which presents controversy as a generally accepted regularity.

The excerpt takes advantage of the controversial nature of fasting by presenting the expectation that the faculty of medicine might have rejected the thesis because of the controversial topic of the research. The adjective ‘eminent’ establishes the authority of the faculty of medicine and generates the acceptability of the thesis, despite its controversial theme. The third sentence in the excerpt includes two negative expressions, ‘will not accept’ and ‘does not meet’, indicating the expectation that the faculty of medicine might lose some of its eminence if it did not have criteria for scientific work or if it accepted theses that did not meet those criteria. This notion refers directly to the *Sceptic* editorial’s claim that ‘the thesis did not, according to the opponents, meet the scientific criteria for thesis work’, and rejects the possibility that the scientific criteria were not met. The faculty of medicine is invoked as the institutional actor in the decision as to the scientific criteria of the thesis. The verb ‘accept’ is repeated twice – in the second and third sentences – which highlights the evaluation process and produces the acceptability of the topic of research.

The excerpt presents the thesis as a piece of research to be reckoned with, despite the controversial nature of the research topic and its belonging to the sphere of alternative treatments instead of being more directly connected with academic medicine. Thus the boundary between alternative treatments and academic medicine is dissolved through the presentation of the acceptability of the thesis

research and topic. As the *Sceptic* response is written for a journal of the scepticism movement, it presents the thesis procedure as having been correctly performed and highlights the strong authority of the medical faculty, thereby constructing the respectability of research on alternative treatments.

It is characteristic of this form of boundary-work between science and other knowledge systems to utilise controversiality to generate an understanding of alternative treatments. Belonging to the sphere of alternative treatments is not seen to hamper scientific research on them.

Nursing science in boundary-work between science and other knowledge systems

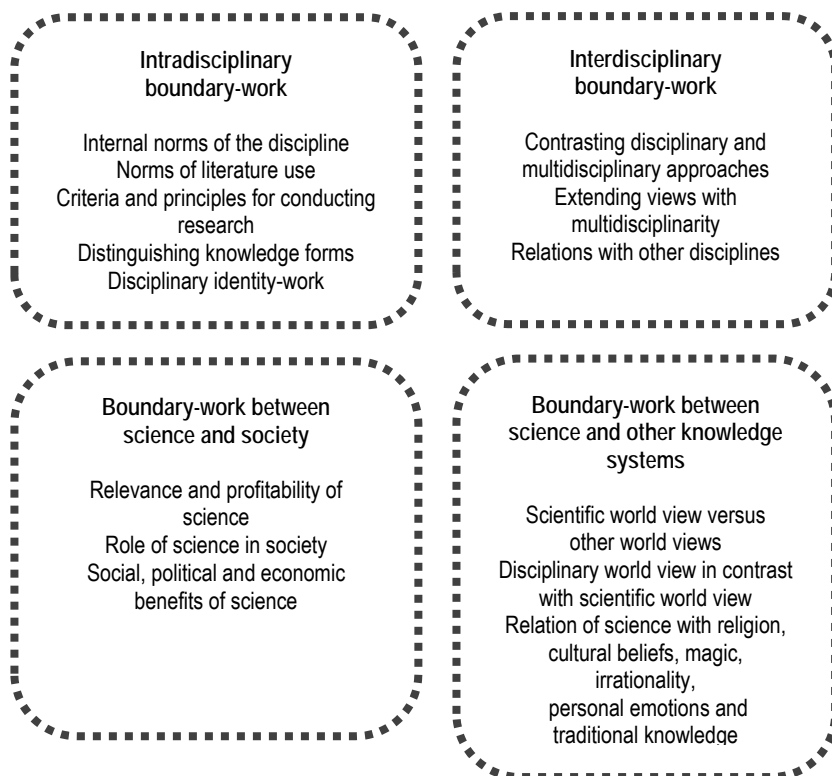
Boundary-work between science and other knowledge systems separates the natural scientific world view from other world views. It differentiates the nursing science world view from that of the natural sciences. It also produces controversiality as an asset in research. Boundary-work between science and other knowledge systems produces the relationship of science with religion, cultural beliefs, magic, irrationality, personal emotions and tradition.

In one form of boundary-work between science and other knowledge systems, which contrasts the nursing science world view with that of the natural sciences, nursing science is depicted as a young field. Its ways of belonging to science are questioned, and its scientific world view is pondered over. Boundary-work is done to map out the disciplinary world view of nursing science mainly from the perspective of scepticism. Nursing science is depicted as a young field which has difficulties in formulating the criteria for scientific research. It is also characterised as a discipline through which dubious elements can enter the scientific sphere. In the boundary-work between science and other knowledge systems, the representatives of nursing science do not present any viewpoints.

The forms of boundary-work in the conflict over fasting

The forms of boundary-work in the conflict over fasting are summarised in figure 2. The figure illustrates the details of the forms of boundary-work that were activated in the argumentation during the conflict over fasting. Each form of boundary-work consists of multiple aspects and sheds new light on the understanding of boundary-work. Thus the conflict over fasting supports the framework of this study, which was developed on the basis of the literature on scientific conflict and controversy.

Figure 2. The forms of boundary-work in the conflict over fasting



The intradisciplinary boundary-work in the conflict over fasting was found to consist in formulating the internal norms of the discipline, particularly the norms of literature use, and the criteria and principles for conducting research. The intradisciplinary boundary-work separated knowledge forms and established the identity of the discipline. The argumentation revealed that the intradisciplinary boundary-work took place at quite a general level, encompassing argumentation about the general norms of good research in many disciplines. The argumentation also reflected broad contrasts between schools of thought across many disciplines, such as in the debates concerning qualitative versus quantitative or subjective versus objective knowledge forms. The only form in which the discipline of nursing science was discussed was the identity-work of nursing science. This revealed interesting contrasting qualities of the discipline.

The interdisciplinary boundary-work in the conflict over fasting was found to consist in contrasting disciplinary and multidisciplinary approaches and extending views with multidisciplinary. The argumentation centred on the issue of multidisciplinary, and it did not contain much argumentation about the actual relations of nursing science with other disciplines or about how multidisciplinary or interdisciplinarity are enacted in nursing science. The relations of nursing science with diverse disciplines were not discussed. However, the relation with medicine was discussed to some extent.

Boundary-work between science and society in the conflict over fasting reflected the understanding of the relevance and profitability of research in medicine or other natural sciences. It highlighted the broad role of science in society and revealed some general social, political and economic benefits of science. However, the discussion did not necessarily do justice to the relationship between a profession-oriented discipline and society, as outsiders to the discipline had a strong voice in the boundary-work between science and society.

Boundary-work between science and other knowledge systems was manifold, and it opened up the forms of boundary-work in this respect. The relation of science with religion, cultural beliefs, magic, irrationality, personal emotions and traditions was activated. However, the articulations of the sceptics were emphasised in the argumentation, and the specific characterisations of nursing science in relation to other knowledge systems did not get much space. The forms of boundary-work could have been more centred on the special

characteristics of nursing science as a profession-oriented, female and young discipline.

Overall, although the conflict over fasting did reveal a variety of forms of boundary-work, the findings indicate that there is a need to look at another conflict in nursing science in order to find more forms of boundary-work specific to nursing science. To this end, the next chapter will present the analysis of the conflict over therapeutic touch.

5. The conflict over therapeutic touch

Introduction to the conflict over therapeutic touch

The conflict over therapeutic touch occurred at the end of the same year as the conflict over fasting, 1996, and in the same department of nursing science, in the University of Tampere. A Masters thesis on the concept of therapeutic touch had been accepted in nursing science in 1993 with a good grade (*magna cum laude approbatur*), and in the evaluation statements the thesis was characterised in this vein:

The study is an analysis of the concept of therapeutic touch, based on nursing scientific textual material, and it redefines the concept. The topic is interesting and important from the point of view of nursing science. In the report the starting points of the research are carefully justified. The course of the study is described accurately, and the textual research material is collected carefully. (Evaluation statement on Masters thesis 'The analysis and reconceptualisation of the concept of therapeutic touch' by Irma Kiikkala 1.6.1993)

The reliability of the research is considered very meritoriously and is well justified. In the discussion, the significance of research on therapeutic touch for nursing work and nursing education is discussed. (Evaluation statement on Masters thesis 'The analysis and reconceptualisation of the concept of therapeutic touch' by Arja Liukkonen 2.6.1993)

The conflict arose after the Masters thesis was published as a book by the publishing house Kirjayhtymä, which was well known as a reputable publisher of textbooks for social and healthcare professional education. The publisher received the annual Humbug Award given by the Finnish Association of Sceptics. This award is considered an indication of poor and unscientific research. It had previously been given to publishers or educational institutions that had published books or given courses on astrology and numerology. It had also been given to the main Finnish public television channel for uncritically presenting unscientific claims in science programmes. According to

the rationale provided for the Humbug Award, the treatment of therapeutic touch was unscientific and the book itself poorly grounded in scientific research. When the Finnish Association of Sceptics announced the award, it was introduced in *Sceptic*, the journal of the scepticism movement. The introductory articles consist of three parts: the Association's reasons for giving the award for this particular book, the publisher's reply, and an interview with the professor at the University of Tampere. The interview was conducted soon after the rationale for the award was announced. A couple of medical specialists, one of whom was active in the scepticism movement, also wrote about the book on therapeutic touch.

As a consequence of the Humbug Award, the department of nursing science made a decision that theses using certain theories or books would no longer be accepted in the department. This literally meant a ban on certain books and theoretical frameworks from Masters and doctoral theses in this department of nursing science. The Masters thesis had used the books in question, but had not relied on them exclusively. A subscription to a journal in nursing science was also cancelled. It was normal at the time for journals used by researchers in the department to be subscribed to directly by the department, even though they would also be available in the university library. In general, the departmental committee's decisions were about the practical organisation of teaching and research at the department, and thus the minutes of its meetings were important guidelines for the department's professors, staff and students. Furthermore, the minutes are public documents, and were also important for the department's communication with the larger bodies to which it belonged at the time, namely the faculty of medicine and the administrative board of the whole university.

At the committee meeting in question, one professor, one associate professor, one lecturer and one student were present, representing the three main groups on the committee: professors, other staff and students.²³ The representation of different groups followed the normal procedure for departmental committees at the University of Tampere at the time. There was one professor and one associate professor in the department, and they were both present at the meeting. Three lecturers, one assistant and three research support staff belonging to

²³ Department of nursing science, minutes of departmental committee 17.12.1996.

the category of 'other staff' were represented by one lecturer, and about 350 students were represented by one student.²⁴

After the Humbug Award and the book ban, discussion arose in professional and scientific journals about therapeutic touch, its theoretical underpinnings, and the ban on the theories and books. The conflict lasted for a few months, and then the discussion faded. Two individuals were especially active in the discussion, a journalist from the scepticism movement and the professor of nursing science at the University of Tampere. The journalist wrote an editorial in *Sceptic* and did an interview with the professor. She also wrote to a university bulletin of the University of Helsinki. In other words, the journalist marketed and explained the Humbug Award in several forums. The professor of nursing science, who was also the head of department, answered eight broad questions regarding therapeutic touch and nursing science in the interview with the journalist. She commented on and interpreted the book in several forums: to sceptics, to nursing scholars, and to nursing students at the University of Tampere. This meant that she became a central figure in the conflict over therapeutic touch.

There were criticisms from many directions of the departmental committee's decision to ban the theories and books. One of the critics was the author of the book on therapeutic touch, i.e. the former student in the department of nursing science at the University of Tampere, who presented her criticisms in a publication of the University of Helsinki. Her article responded to an earlier article in the same publication by the journalist from the scepticism movement. In the article entitled 'Spiritual healing for nurses?' the journalist evaluated the unscientific character of the book on therapeutic touch. The book's author answered the criticisms and defended both her Masters thesis and her book. Her response began by rejecting the journalist's claim that the book focuses on New Age thinking. Then the response identified nursing science by listing nursing science literature. After these points, the response turned to a criticism of the norm-production process in nursing science:

²⁴ Tampereen yliopisto 2011. The departmental secretary was asked about student numbers, and stated that the numbers of registered students in the department were 298 Masters degree students and 63 postgraduate students in 1996, and 309 Masters degree students and 68 postgraduate students in 1997 (e-mail correspondence Tuula Lähdekorpi 15.3.2011)

Now I ask, what in reality is the question about, does nursing science want to scuttle its own earlier teachings or is this a matter of prejudice or fear? Why is therapeutic touch ‘inflammatory’ in this way? It is just one phenomenon among many phenomena, and I think it should be dispassionately and open-mindedly analysed and researched, and not banned because the issue of energy fields or energy changes cannot yet be measured with current measuring tools. Nursing science should, in my view, be interested in all things concerning human beings, and remember that some of these things are measurable and some remain outside the measurable world.

Does science advance only by researching measurable, known things, or should it ‘reach further’, check present values and create a new synthesis? (Rautajoki, Anja 1997. Does nursing science scuttle its own teachings? *Yliopisto [University]* 2/97, 29-30)

An ethics column in *Nurse*, the journal of the professional association of nurses, also criticised the departmental committee’s decision. The column was published approximately two months after the award. The journal is a professional publication for nurses, and its regular articles present ideas for the development of nursing practice. At the time of this episode, the journal included a Q&A column in which a professor emerita from the University of Tampere’s department of nursing science responded to ethical questions from the general readership, i.e. professional nurses. The column is entitled ‘What are the ethics of research and teaching in nursing science like?’ and the question is signed by a pseudonymous ‘Perplexed Bystander’.

The practitioner’s letter starts by outlining Perplexed Bystander’s future plans to start studies in nursing science. Then the text of the committee’s decision is quoted from the minutes. After that, Perplexed Bystander expresses her astonishment at the decision. She introduces herself as if she belongs to the category of journal’s general reader, a nurse practitioner who is considering studying nursing science in the near future. The end of the practitioner’s letter poses some questions to be answered by the professor emerita:

On what grounds is the use of one interesting theory emphasising humanity prohibited in nursing scientific research? Is nursing science a science in which, by a professor’s and/or departmental committee’s decision, some nursing scientific research and publications can be declared banned, without stating the reasons? How in nursing science can one find one’s way to new research projects if one’s scientific curiosity is focused outside the interests of the professor? How can I learn to understand the patients if I cannot be scientifically interested in their ideologies if they should be New Age – whatever that means? How can a

student advocate her own interests without being labelled a user of forbidden literature? Does it pay off for a nurse who is interested in her work to study nursing science at all? (Kalkas, Hertta 1997. Ethical dilemma column 'What are the ethics of research and teaching in nursing science like?' Question by Perplexed Bystander. *Sairaanhoitaja [Nurse]* 70 (2), 32, 21.2.1997)

Students in the department of nursing science at the University of Tampere also reacted to the committee's decision. An article in the journal of the University of Tampere Student Union outlined the weaknesses of the norm-production process in nursing science. The aim of this journal is to act as an advocate for students of all disciplines at the university, and to give a voice to students in the scientific community. The journal acts as a forum for the free expression of the students' feelings, for criticisms of university teachers and departments from the students' point of view, and for the discussion of themes that agitate the students at the university. Contributors to the journal are usually students seeking to promoting students' status at the university. The article reveals the norm-producing process from the point of view of a student of nursing science. One anonymous student is interviewed in the article. The article outlines the situation as Parse's thinking was cast in a dubious light by the Humbug Award for the book on therapeutic touch:

'The book did not deal with Parse's thinking, but instead its broad focus was completely elsewhere. The Humbug Award was scaremongering to blacken the whole of nursing science. The department got frightened and the use of Parse's theory was banned straight away without closer consideration,' says the student.

At the moment there are several theses and project reports under preparation in the department. For many the ban came as a complete surprise and shock.

'If Parse is not accepted, many will lose an enormous amount of work. Where is the student's legal protection? At the moment nobody knows what is accepted and what not.' (Venäläinen, Riikka 1997. Theories are being argued over at the department of nursing science. Is the student's legal protection in danger? *Aviisi [Student journal]* 3/97, 12.2.1997, 9)

An individual student of nursing science also criticised the decision in a local daily newspaper. The student's opinion was published in an

opinion column which is open to readers for the discussion of issues of their choice. The response addressed the first opinion's viewpoints directly and stated:

The text presented several hints about humbug ideology and humbug theory. Why did Paunonen, Åstedt-Kurki and Nieminen want to present their material in such an implicit, hidden way? If the writers are so convinced about the rightness of their view, why did they not directly name the theory which so endangers the quality of healthcare and professional nursing?

It might be reasonable to assume that the writers have acquainted themselves with this unnamed theory in great detail. Why did they not present their critique directly by directing it at this specific humbug theory, its starting points and ideas? (Virtanen, Mika 1997. The views of nursing scholars provoke astonishment. *Aamulehti* [Morning News], 2.1.1997)

The progression from the Masters thesis to the book, the Humbug Award and the subsequent discussion produced rich material for research. The following four subchapters present my analysis of the forms of boundary-work in the conflict over therapeutic touch. Each chapter ends with a summarising section in which the qualities attributed to nursing science through boundary-work are presented. After the four subchapters there is a final subchapter in which the forms of boundary-work are summarised. Reading through the analysis gives a deep understanding of how the forms of boundary-work were rhetorically created and how the qualities of nursing science were produced through rhetorical means in the conflict over therapeutic touch.

Intradisciplinary boundary-work

This subchapter presents the analysis of intradisciplinary boundary-work in the conflict over therapeutic touch. The intradisciplinary boundary-work was discovered to consist of four forms: clarifying the practices of the discipline, articulating the principles of good research, constructing a unified community, and depicting the multiform community of nursing science. It was found in the meeting minutes, the discussion article, the *Sceptic* interview and the ethics column,

excerpts from which are presented to characterise each form of boundary-work.

Clarifying the practices of the discipline

The first form of intradisciplinary boundary-work consists in clarifying the practices of the discipline, and was found in the minutes of the meeting of the nursing science departmental committee. The minutes describe the decision by the University of Tampere's departmental committee in December 1996, and they are analysed here in three parts. The minutes describe the decision of the meeting:

The questions of the quality of nursing science teaching and learning were discussed. In particular, recently published writings about the relationship between nursing science and ideological trends shorn of scientific basis were raised. It was noted that from now on there is a need to sharpen nursing science's quality of teaching and its line (definition of policy) and to maintain scientific standards. (Meeting minutes, nursing science departmental committee, University of Tampere, 17.12.1996, present: Professor Marita Paunonen, Senior Lecturer Heli Nieminen, Associate Professor Päivi Åstedt-Kurki, Student Tiina Pennanen and Secretary Vesa Korhonen)

The excerpt starts with the word 'quality', linking the committee's decision with the quality of university teaching and the comprehensive development of the teaching and learning processes in the department. Thus the decision is connected with the broader quality assurance process of the university. The temporal expression 'recently published' abstractly specifies the writings in question as having emerged recently. The minutes indicate that there was no need to specify which writings were meant. This generates the impression that the writings had received such broad publicity that it could be presupposed that they were known to the general reader – the students in the department, departmental staff and university administrative staff. Thus the notion presupposes an inner circle of individuals who know about the writings, and the minutes do not express a need to explain these well-known writings to a broader audience. The genre of the minutes also directs the writing style towards terseness. Stating the obvious does not belong to this style.

The preposition 'about' categorises the texts in question as writings that discuss the relationship of nursing science with ideological trends

that do not have a scientific basis. The expression 'shorn of' indicates a deficiency in those ideological trends, and contrasts them with nursing science's maintenance of 'scientific standards'. Thus nursing science is related to scientific standards and a scientific basis, whereas the other ideological trends mentioned by the unspecified writings are distanced from these standards and this basis. The temporal expression 'from now on' articulates that there is a need for a change in practices regarding theses at the department. The excerpt stresses that there has not been a clear policy definition and that this would be desirable, and it proposes the need for a change of policy. The verb 'sharpen' generates an impression of clearly defined disciplinary boundaries, evoking connotations of disciplinary dogmatism.

The minutes continue:

The departmental committee decided that from now on any nursing science theses that contain mentions of or references to New Age ideology or Parse's theory will not be accepted. Additionally it was decided that the subscription to the journal *Nursing Science Quarterly* will be cancelled. It was also decided to remove the book Meleis A. *Theoretical Nursing: Development and Progress*. Lippincott 1991 from the curriculum. (Meeting minutes, nursing science departmental committee, University of Tampere, 17.12.1996, present: Professor Marita Paunonen, Senior Lecturer Heli Nieminen, Associate Professor Päivi Åstedt-Kurki, Student Tiina Pennanen and Secretary Vesa Korhonen)

The expression 'from now on' is repeated at the beginning of the second paragraph. It generates the impression that theses containing undesirable elements have previously been accepted. The extreme expression 'any' conveys that the decision is peremptory and absolute. The first sentence of the excerpt defines the four undesirable elements as mentions of New Age ideology, mentions of Parse's theory, references to New Age ideology and references to Parse's theory. The decision clearly bans these elements from nursing science theses, and thus produces these elements as exclusions from the department's policy. The excerpt gives the impression that the ban cleanses the department of undesirable previous elements, and that in doing so it improves the quality of the theses. The excerpt limits the ban to nursing science theses, and it simultaneously accentuates the authority of the departmental committee to decide on the literature to be used in theses and to accept or reject theses. The linking word 'or' between the New Age ideologies and Parse's theories indicates that these two things are distinct from each other. Another option would have been

the linking word ‘and’, and thus the selection of the word ‘or’ differentiates New Age ideology from Parse’s theory. Thus New Age ideology and Parse’s theory are linked with each other as undesirable elements in nursing science, but as ideologies they are presented as separate from each other.

The adverbs ‘additionally’ and ‘also’ connect the limitations on literature use with the decisions to cancel the subscription to the journal²⁵ and to exclude one book from the curriculum. This generates the effect of connecting the separate elements of the decision together as well as to the related issue of quality in nursing science theses. Two theorists are explicitly mentioned in the minutes: Rosemarie Rizzo Parse and Afaf Ibrahim Meleis.²⁶ It is stated that Parse’s theoretical works will not be accepted as references, and that a book by Meleis is to be removed from the curriculum. The style of the minutes is terse, and the grounds on which these theorists are banned are not explained. This constructs the decision of the departmental committee as non-negotiable and thus accentuates the authority of the committee over nursing science theses.

The excerpt describes the decision to cancel the subscription to the journal *Nursing Science Quarterly* in the same curt style as the other decisions, in line with the genre of meeting minutes. At that time Parse was the editor-in-chief of the journal in question, and thus the decision to cancel the subscription strengthens the ban on references to and mentions of Parse’s theory. The decision broadens the rejection of Parse’s theory from nursing science theses to a journal under her direction, and generates the impression that the decision is a ban on a certain school of thought within nursing science that is embodied in Parse’s theoretical books and in the journal.

The minutes continue:

The departmental committee also decided that it is necessary to reinstate evaluators’ statements in Masters theses before publication, so that the assessment and evaluation of the level of the work will be easier. The

²⁵ Most likely the decision cancelled the subscription to the journal for the departmental collection. The university library continued to subscribe to the journal. The journal is available in the university library via Sage Journals online service.

²⁶ The webpages of these American nursing scholars present Meleis and Parse as well-known nursing theorists, Meleis a professor (University of Pennsylvania 2013) and Parse a professor and consultant (International Consortium of Parse Scholars 2013). Their books were used on the curriculum of nursing science at the University of Tampere. Parse’s theories were also taught and read in polytechnics, and were used as part of extensive training in some hospitals. Both theorists had visited Finland.

evaluators must also pay more attention than previously to the evaluation forms for Masters theses. (Meeting minutes, nursing science departmental committee, University of Tampere, 17.12.1996, present: Professor Marita Paunonen, Senior Lecturer Heli Nieminen, Associate Professor Päivi Åstedt-Kurki, Student Tiina Pennanen and Secretary Vesa Korhonen)

The excerpt starts by using the verb 'reinstate', indicating that there was an undesirable period during which evaluators' statements were not inserted into published Masters theses. The impression is furthered with the comparative form 'easier', indicating that the assessment and evaluation of theses has been made more difficult by the omission of statements from published theses during a time period not specified in the description of the decision.

These notions relate to the practice of publishing Masters theses in the department. Normal procedure was that the thesis would be held in the university library, and that the evaluators' statements would be inserted into the back of the thesis. Roughly 30 copies of each thesis would be sold by the university bookshop through subscriptions from regular customers (hospital libraries and nursing education institutions), and an additional 10–20 would be sold in the bookshop. According to the university bookshop, no other department shared this practice of selling Masters theses through the shop.²⁷ A few theses would also be delivered to libraries in the university, the department, the University of Helsinki's school of nursing and central library for health sciences, and individual nursing practitioners in Tampere's university hospital. The departmental committee's concern over Masters theses published without evaluators' statements may reflect the expectation that broad audiences read nursing science Masters theses. The minutes may reflect the worry that the evaluators' statements could potentially have an impact on how the theses are valued and read by general readers.

It is characteristic of this form of intradisciplinary boundary-work to clarify practices in the use of literature and in the evaluation and publication of theses in nursing science at the department.

²⁷ Email correspondence with Tuula Järvinen (3.3.2011) and Soile Levälähti (22.2.2011) from the University of Tampere bookshop.

Principles of good research

Another form of intradisciplinary boundary-work is the articulation of the principles of good research. This form was found in a discussion article in the Finnish scientific journal *Nursing Science*. At the time of the article, each issue of the journal consisted of an editorial and four or five research articles. The editorial would be a short introduction to the issue, summarising the articles. The research articles would be original work containing literature reviews, genuine empirical research, findings and discussion. Occasionally the journal also ran discussion articles.²⁸ The discussion articles would be shorter than the research articles, and would discuss a current issue without necessarily providing many references to literature. The fairly long discussion article in question is by a senior lecturer in nursing science at the University of Tampere. The article analyses one book, *Man-Living-Health* by Rosemarie Rizzo Parse (1981). The article will be analysed here in five parts. The discussion article argues:

The lack of expertise in the philosophy of science is proved by the reference to Nietzsche on page 60. Here she talks about her own concept, 'powering', which Parse introduces in that context to strengthen its content. The reference is to Nietzsche's *The Will to Power*, ed. W. Kaufmann (1968). In the bibliography the same work appears with the additional note that it is translated by Walter Kaufmann. Nietzsche himself never wrote a book by that name. (Nieminen, Heli 1996. Phenomenology, Parse and nursing science. *Hoitotiede [Nursing Science]* 8 (3), 158–161)

The first sentence specifies a page number of the book, and thus establishes the credibility of the article. The use of the expression 'lack of expertise' points to the expectation that Parse would have shown greater expertise in the philosophy of science. Through this notion the writer is positioned as superior by analysing the book, and simultaneously Parse's authority is diminished. The extreme expression 'never' impugns Parse's knowledge and demonstrates her violation of the norms of literature use in nursing science. The norm is to deeply understand the books to which one refers, and to present them correctly in the references list. Parse's actions regarding literature

²⁸ There were nine discussion articles during 1996, and two during 1997. From the beginning of the journal in 1989 to date there have been fewer than 30 discussion articles. The year 1996 was exceptionally active (Vuolanto 2004).

use are presented as wrong, and thus the book is presented as failing to meet the criteria of good scientific work. The principles of good nursing science are thus produced through the norms of literature use.

The article continues:

Nietzsche's concept of the 'superman' feels quite odd as a starting point for the development of theory in nursing science. Or is it, however, the case that Parse does not know anything about Nietzsche's thought? If she had really read the book *Thus Spoke Zarathustra*, which is mentioned in the bibliography, she might have understood what the concept 'will to power' (*der Wille zu Macht*) means in Nietzsche. (Nieminen, Heli 1996. Phenomenology, Parse and nursing science. *Hoitotiede [Nursing Science]* 8 (3), 158–161)

The evaluating adjective 'quite odd' presents Parse's ideas as unfamiliar to scientific thinking, and thus connotes unscientific ways of knowledge production. The linking word 'however' indicates scepticism about Parse's knowledge. The extreme expression 'not anything' maximises the effect of scepticism. It suggests the completeness of the lack of understanding of Nietzsche, and regularises that lack of understanding as habitual with Parse. The effect is furthered through the conditional expression 'if she had really', suggesting that Parse most likely has not read the book to which she refers. This creates the norm for nursing science that one should have read the books that one mentions in one's bibliography. It produces Parse as repeatedly breaking the rules of good scientific conduct. Another conditional, 'might have understood', erodes Parse's authority and generates a credibility gap by hinting that Parse is not capable of understanding the books she reads. This attacks Parse and disarms the opponent with factualising argumentation, powerfully quelling possible counterarguments. Thus Parse's book is shown to be unconvincing, and its violations of nursing science's norms of literature use are emphasised. The principles of good and bad science are produced in the form of norms of literature use.

The article goes on:

When reading the book one gets the impression that Parse does not have the foggiest idea what phenomenology or existential phenomenology are. This impression is based for example on her description of intentionality on pages 18–19. The text contains one sentence from Heidegger and a reference to Heidegger, *Being and Time*, pages 86–87. Anyone who has even a little familiarity with phenomenological and existential thought will

understand how central the concept of intentionality is in this philosophy. One cannot refer to it by mentioning some page in some book. Intentionality is not the same kind of thing as a T-test, the formula for which can be found on some page in some book. (Nieminen, Heli 1996. Phenomenology, Parse and nursing science. *Hoitotiede [Nursing Science]* 8 (3), 158–161)

The excerpt starts by using the impersonal pronoun ‘one’, generalising the impression made on the writer and creating the effect that anyone reading the book would come to the same conclusion. Thus the incontrovertibility of the impression is generated. The expression ‘the foggiest idea’, containing the potential meaning of poor understanding, conveys that Parse does not understand the phenomenology which she claims is the basis for her thinking. The negation ‘does not have’ may relate to a notion about Parse at the beginning of the article, which states that she is ‘claimed to be an outstanding representative of phenomenology among nursing theorists’. The negation thus produces the expectation that, with such a reputation, Parse should have a clear idea of what existential phenomenology means, but the expectation is not met and the reader is convinced that she cannot trust Parse to have good knowledge of phenomenology.

The excerpt continues by identifying the pages on which Parse uses the central concepts of phenomenology in her book. The expression ‘for example’ indicates that this is just one occasion demonstrating the poor use of phenomenological concepts, and that the writer could have chosen from among many other shortcomings in this respect. Thus the argument about the poor use of the concept of intentionality is made easier to accept. The excerpt quantifies the description of phenomenology with the number ‘one’ before the word ‘sentence’, generating an impression of the scantiness of information on the concept. This illustrates an expectation of plentiful information on the concept of intentionality and of the use of an expansive writing style when defining phenomenology conceptually. The expectation is not met; instead, intentionality is described scantily, and so the book is labelled as having poorly understood what phenomenology entails and how phenomenology should be presented in a book about nursing science theory.

The evaluating adverb ‘even a little’ adds to the impression that Parse does not understand what phenomenology is about, and creates an extreme image of Parse as not at all familiar with phenomenology

despite claiming to be so. This makes the impact that Parse has knowingly misled the reader and has used fraud with an intent to deceive. The impression that Parse has unintelligently violated the rules is also generated.

The negation 'one cannot' indicates that the writer expected intentionality to be described broadly across the whole book or sections of the book, rather than just being mentioned on one page. The modal verb 'can' strengthens this effect and reveals that this type of reference does not belong to the writer's understanding of how to write and conduct research. Another negation, 'is not', defines intentionality as a qualitative research concept by distinguishing it from research concepts such as the T-test, which belongs to the quantitative research tradition. This produces a distinction between the requirements of qualitative and quantitative research. Quantitative research is associated with formulas and simple referencing, whereas qualitative research requires broader argumentation and referencing. The excerpt thus distinguishes between the qualitative and quantitative research approaches by categorising them on the grounds of their distinct practices regarding referencing and argumentation.

The concluding part of the article turns to the ethical principles of research:

Parse's own theory therefore emerges from a soup cooked from the following ingredients: some existential-phenomenological concepts understood in the Parse way, some of Roger's concepts, and some of Parse's own thoughts, the philosophical origin of which is impossible to trace. (Nieminen, Heli 1996. *Phenomenology, Parse and nursing science*. *Hoitotiede [Nursing Science]* 8 (3), 158–161)

This excerpt starts with the metaphor 'soup', connoting food in which the ingredients are mixed so that details cannot be specified. The notion also evokes the image of a mishmash of various ideas, carelessly thrown together with none of the careful consideration expected of scientific work. In the excerpt a list of three ingredients is given. The list condenses the violations by Parse's theory of the principles of good research into a few words. The first violation regards Parse's understanding of what is claimed to be central to the existential-phenomenological school of thought, the interpretation of central concepts. The notion 'in the Parse way' indicates that the interpretation is made incorrectly, and that it deviates from the script and normal outlines of this school of thought. Thus any identification

of Parse with phenomenology is presented as impossible, and Parse is situated outside the borders of the school of thought. This produces the norm that nursing science theories will stay within the borders of the school of thought indicated in the theory.

The third violation concerns the philosophical origins of Parse's thinking. The repetition of the determiner 'some' quantifies the ideas, minimising the amount of genuine thinking contributed by Parse to the theory. The evaluative adjective 'impossible' presents an expectation that theoretical thinking should be connectable to philosophical thinking. This distinguishes philosophical thinking from thinking in specialist areas. It makes philosophy a generic school from which specialist areas have emerged. Philosophy forms the general starting point to which all thinking should be traceable. The violation in Parse's theory is that, according to the writer, it fails to make a connection with general philosophical thinking; instead, the origin of the theory cannot be traced back to philosophy, even though Parse claims in the book that its origin is in the phenomenological school of thought. Thus poor science is defined as containing diversions that are disconnected from previous general scientific bases. The norm is produced that nursing science should belong to some line of thinking in a broader philosophical framework.

The importance of ethical principles is emphasised in an excerpt near the end of the article:

I also think that good research ethics includes the demand that only books that really have been read should be listed in the references. This is already taught in basic education. Perhaps the universally accepted research ethics principles are not as important and binding in American culture. But they do bind researchers who work in Finnish universities. I think that when reading and teaching Parse, they should make themselves thoroughly conversant with the scientific nature of Parse's thinking, and evaluate it critically. (Nieminen, Heli 1996. Phenomenology, Parse and nursing science. *Hoitotiede [Nursing Science]* 8 (3), 158–161)

The evaluating adjective 'good' highlights the principles of good research and contrasts the latter with poor research that does not apply ethical principles. The sentence suggests that Parse has listed references that she has not read, and this is considered a violation of the ethics of research. The norm is formulated that the references listed in a theoretical book should include only those books that have been read by the author. This produces a research ethics principle that

requires erudition on the part of the overseer of that norm. This constructs the authority of the article writer as an erudite nursing scholar capable of assessing the reading of another nursing scholar. The norm also constructs nursing science as a rigorous discipline in which the nursing theorist's breadth of reading can constitute grounds for the theory's rejection or approval.

The latter part of the excerpt contrasts Finnish and American nursing science education by labelling Parse an American nursing scholar. The adverb 'already' indicates a lack of confidence in American nursing education by suggesting that American ethical principles are not at the same high level as Finnish ethical principles. The reference to ethical principles learnt during basic education gives an impression that Parse has not gone through the kind of high-quality basic education required of Finnish nursing scholars, and it also positions American basic education as low-level compared with its Finnish counterpart. The extreme expression 'universal' generalises the good ethical principles of Finnish nursing science to the whole world and simultaneously localises poor ethical principles in American nursing science. Thus Finnish and American nursing science are distinguished, and this American type of ethics is ejected from the sphere of Finnish nursing science.

The last sentence in the excerpt gives directions specifically to Finnish nursing scholars working in Finnish universities. The adverb 'thoroughly' gives the impression that Finnish nursing scholars have not previously studied the scientific character of Parse's theory in depth. They have not noticed its unscientific character. Rather, the article writer generates the effect that nursing scholars have been carelessly and uncritically reading and teaching Parse's theory. The verb 'evaluate' creates the impression that the ideal in nursing science is to assess science according to a standardised scale, and to reject the kind of science that does not fit that scale. The measuring procedure is conducted by separating good from bad science, and establishes nursing science as a careful scientific activity in which, on the basis of quality standards, not all theories can be included.

It is characteristic for this form of intradisciplinary boundary-work to discuss the principles of literature use, the practices of referencing in books, the distinct argumentation practices belonging to separate schools of thought, and the ethical principles of research. This form of boundary-work also describes differences between the principles of Finnish and American nursing science.

The uniform identity of Finnish nursing science

The third form of intradisciplinary boundary-work generates impressions of a uniform identity of nursing science. This form appears in six excerpts in the *Sceptic* interview with the professor of nursing science. The *Sceptic* interview is comprised of a total of eight questions, enquiring about the therapeutic-touch book and other books being published for healthcare professionals, the book's background as a Masters thesis, its central concepts and theories, and the unscientific nature of the work. The professor answered the questions one by one. The first question asks: 'What is your opinion, Professor Paunonen, about the publication of books like this as textbooks for professionals and students of healthcare?' The professor starts by acknowledging the Association of Sceptics:

The initiative by the Association of Sceptics to intervene in the phenomenon in question and give the Humbug Award to Kirjayhtymä supports the critical discussion that has already been started by University of Tampere's department of nursing science about New Age ideology-based approaches (for example, *Nursing Science* no. 3/1996). All the representatives of the scientific universities in the field are also united in this critical view. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

The temporal expression 'has already been' indicates that the University of Tampere's department of nursing science was the first to start the discussion, which emphasises the role of the department as a definer of nursing science's disciplinary boundaries. The Association of Sceptics is presented as joining nursing scholars' criticism, and the sceptics' role becomes that of supporters of the criticism launched by the nursing science department. This generates the impression that the critical discussion was started by the whole department, which establishes the department as unanimous in its criticism. The professor answering the question also speaks on behalf of the whole department, which produces a unanimity of the department about New Age ideological approaches and presents the views of departmental staff as harmonious, without heterogeneity.

The professor's answer refers to an article in the journal *Nursing Science*. There are no articles containing this type of discussion in issue 3 of the journal in 1996 other than the article entitled

'Phenomenology, Parse and nursing science' analysed in the previous section. However, the term 'New Age' is not mentioned in this article; instead the article evaluates a book by Parse which claims to belong to the phenomenological research tradition. Nevertheless, this article analysing poor research practices is labelled by the nursing science professor as an exemplary case of the successful protection of the boundary between science and non-science.

The professor's answer categorises the therapeutic-touch book as New Age ideology. The evaluative adjective 'critical' is repeated, which creates the impression that well-thought-out discussion and careful consideration are prevailing regulatory practices in the field of nursing science when its boundaries are being defined. The last sentence in the excerpt contains the extreme expression 'all', which justifies the action of the nursing science department. Simultaneously it also generalises the united opinion of the department at Tampere to all five of the universities teaching nursing science at that time.²⁹ This creates an effect of unanimity about nursing science's boundaries in Finnish universities. It highlights the shared criteria and actions of the field for demarcating good from bad and poor science. Thus in the scepticism movement's journal, the nursing science professor is granted the power to act as a spokeswoman for the discipline as a whole, and to generate an impression that there is disciplinary unity and that all representatives of nursing science hold same views about boundary protection.

The philosopher of science Tom Beauchamp (1987, 30, 33) differentiates negotiation from consensus in the context of scientific debate. According to him, negotiation requires an intentionally arranged settlement of the debated issue between the parties, whereas consensus on a matter can be reached by finding (regardless of the route) some position that can be taken as correct, with no deliberate attempt to negotiate over it. The representatives of the University of Tampere's department of nursing science were the only nursing science representatives taking part in the discussion about New Age approaches in the most usual forums of Finnish nursing science: the scientific journal *Nursing Science*, the professional association journal *Nurse*, the trade union journal *Tehy*, and the medical practitioners' publication *Finnish Medical Journal*. The professor of nursing science in

²⁹ The universities of Tampere, Oulu, Turku, Kuopio and Åbo Akademi had nursing science curriculums at the time. The University of Helsinki also had a curriculum; however, it was phased out by 1998 (Laiho 2005, 240).

Tampere was the only one to be interviewed in the scepticism movement's journal. The professor's notion about all Finnish universities sharing the same critical attitude towards New Age approaches appears to be a consensual rather than a negotiated ending of the debate. The issue of New Age ideologies is presented as closed, and negotiation over it is presented as unnecessary because of the uniformity of the views of nursing science departments. This presents nursing science as a uniform discipline in which New Age ideologies are considered self-evidently unscientific, and the need to negotiate the issue within the field appears small or marginal.

In the journalist's second question the book is introduced as being based on a Masters thesis in nursing science. The journalist asks the nursing science professor: 'How can this kind of work have been accepted as a university-level thesis?' In reply the professor mentions research quality assurance practices:

At the moment departments of nursing science have their own research programmes with different international projects. The students do their theses in these projects under the control and supervision of the project leader. This is the way to ensure that nursing science has a vigorous research profile, and the Rautajoki type of private entrepreneurship is not allowed to happen in the choice of research topic. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [Sceptic] 4/96, 12–15)

The excerpt starts with the temporal notion 'at the moment', which emphasises current practice and elides previous practices as not worth mentioning. The evaluative adjective 'own' indicates that each nursing science department has independent status or activity, and that the departments comprise separate, independent entities with characteristics of their own. The notion 'international' connects the projects to the broader international community and establishes the credibility of the research as belonging to broader schools of thought in the international nursing science context. At the same time the departments are shown to be similar to each other in their practice of having research programmes or projects that guide the students' choice of research topic.

Another similarity between the departments is presented as their strict control and supervision of the choice of research topic. The departments all strive for a vigorous nursing science research profile.

These characterisations demonstrate that nursing science is a controlling and restrictive discipline. Nursing science is constructed as a uniform discipline in its regulatory practices and the protection of its boundaries. Nursing science is also produced as uniform in its ambition for vigorous research profiles. However, the contents of those research profiles are depicted as different from each other in each university, and thus the research conducted at separate universities is presented as distinct in each case. This generates an impression of boundary protection, unanimity and pride over distinct research profiles in terms of topic.

The evaluative adjective 'vigorous' demonstrates the strength and power of nursing science to construct the discipline and guard its boundaries. According to the excerpt, the control and restrictions aim to prevent 'private entrepreneurship', a metaphorical expression connoting students who do their research without guidance and who choose their research topics independently. The 'Rautajoki type' of research is research on undesirable themes outside the sphere of nursing science. The notions of students conducting their research under supervision and of Rautajoki-type entrepreneurship construct the typical nursing science student as a student who is bubbling with ideas and research topics. The ideal practice for protecting nursing science is to restrain the bubbling by guiding the student in the same direction as the department, and to smother unscientific research topics on the basis of the authoritative appraisal of the supervising project leader. Thus the text generates nursing science's authority by introducing a practice of control that involves students and project leaders, and nursing science is constructed as a strong discipline with good control mechanisms. The text generates a uniformity in nursing science in its attitude towards unscientific elements and towards the practice of setting norms and rules. The setting of norms is separated from research topics, which are seen to differ from one department to another.

The third interview question contains a quote from the therapeutic-touch book: 'energy, energy field and energy exchange are much-used concepts in nursing science.' The journalist asks: 'What in reality is the status in nursing science of these concepts, which are borrowed from physics and rationalised in terms of human astral planes and other beliefs from oriental mysticism?' The professor's answer starts with the concepts:

Rautajoki's claim that 'energy, energy field and energy exchange' are generally accepted concepts in nursing science is her own interpretation. In nursing science education in scientific universities in Finland, American nursing science literature is much used because, due to the youth of the discipline, the production of Finnish nursing science university-level scientific textbooks is still in progress. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [Sceptic] 4/96, 12–15)

The excerpt repeats the name of the author of the therapeutic-touch book, which personifies the claims and presents them as belonging to one single person. The effect is strengthened by the adjective 'own' in the expression 'her own interpretation', presenting the interpretation as having been made by one person. In addition to being limited to one single person, the claims are also associated in the excerpt with American nursing science.

Finnish nursing science is characterised as a young and emerging field in which the standards of scientific research are high. The notion of the 'youth of the discipline' is used to explain the use of American nursing science literature, which generates the effect that American literature has been used because there has been no domestic counterpart. It also indicates that as soon as the domestic production of nursing science textbooks has become established, the use of American literature will decline or cease altogether. The production of textbooks in the field in Finland is defined as 'in progress', generating the impression of Finnish nursing science as an emerging discipline. Expectations are produced that in the future the field will have textbooks created by the Finnish nursing science community.

These notions about the use of textbooks in nursing science are related to the fact that the use of foreign textbooks was substantial at the University of Tampere at that time. The Masters degree curriculum in nursing science in 1996–1997 consisted of general studies (23 credits), nursing science intermediate studies (47 credits), elective studies (15 credits), degree programme intermediate studies (35 credits) and advanced special studies (40 credits) (Tampereen yliopisto 1996). Many of the books in nursing science were written in English. This applies especially to nursing science intermediate studies, which were the core nursing science studies on philosophical and scientific requirements, concepts, teaching and research. As many as 86% of the total 65 textbooks in intermediate studies were of foreign

origin and written in English. The remaining 14% (nine textbooks) were of domestic origin. Four of the Finnish books can be considered to be from nursing science; the others were from other disciplines – philosophy, education and social sciences. The notion about the use of American literature thus reflects the focus on foreign nursing science textbooks in the curriculum and raises the difficulties of a young discipline forced to rely on foreign textbooks instead of domestic ones. The criticism generates the effect that the ideal for disciplinary development in the future is to replace the foreign textbooks with domestic ones.

The answer continues:

In the United States, as we know, there are differences between different levels, between different universities and different disciplines, and this also applies in nursing science and in textbooks as well. The majority are of very high quality and meet scientific criteria, but unfortunately others can always also be found. The problems of American nursing science are found in precisely those that have been partly used as references in Rautajoki's book. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

American nursing science is contrasted in the excerpt with Finnish nursing science, and is characterised by level differences and the existence of many kinds of ideology within the discipline. These notions are produced as consensual through the use of the expression 'as we know', and the nursing science professor is depicted as not being alone in her knowledge of American nursing science. The professor is presented as being supported by other Finnish nursing scholars, which smothers other interpretations and voices. The 'level differences' imply a variety, ranging from very poor to excellent, between different universities and disciplines, and this presents level differences in American nursing science as self-evident and as known by the scientific community. The notion of level differences taints the image of American nursing science and creates the effect that American textbooks are unusable.

The excerpt then gives credit to American nursing science with the notion that 'the majority are of very high quality', generating an effect of appreciation towards American nursing science textbooks. This granting of credit is followed by the contrasting connective 'but', partially overturning the meaning of the previous sentence. The

extreme expression ‘always’ gives the impression of a continuous flow of textbooks that do not meet the scientific criteria within American nursing science. The evaluative adverb ‘unfortunately’ suggests an expectation that all textbooks should meet scientific criteria and be of high quality. However, the expectation is not met, and the unpredictability and unreliability of American nursing science textbooks is demonstrated. The ‘problems’ are made relevant through their association with claims by the author of the therapeutic-touch book. The *Sceptic* interview thus applies a twin rhetorical strategy: first it acknowledges American nursing science by referring to a great number of high-grade textbooks, and second it warns about the poor quality of American textbooks, which causes particular problems in the Finnish context. Thus the differentiation between high and poor quality is used to emphasise the problems of American nursing science and the consequences of low quality in other contexts.

The answer continues:

Therefore the topic and acceptability of Rautajoki’s book is established by means of these American models and ideologies. Scientific university teaching and research in nursing science in Finland are not on any level involved with human astral planes, energy fields or energy exchange, and it completely dissociates itself from these. In scientific university research in Finland there is plenty of research in appropriate areas that firmly serve Finnish healthcare and its development. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

With the adverb ‘therefore’ the excerpt connects the therapeutic-touch book with the problems with the ‘models and ideologies’ of American nursing science described in the previous excerpt. Then the excerpt moves on to the characteristics of Finnish nursing science. Finnish nursing science is portrayed as a discipline that is able to distinguish scientific research from unscientific models and ideologies. The expression ‘not on any level involved with’ directly answers the question posed by the journalist: ‘What in reality is the status in nursing science of these concepts, which are borrowed from physics and rationalised in terms of human astral planes and other beliefs from oriental mysticism?’ The answer denies the use of terms such as astral planes, energy fields and energy exchange in nursing science, and creates a boundary between scientific and unscientific terminology.

The adverb ‘completely’ gives the impression of conformity in Finnish nursing science’s dissociation of itself from the unscientific elements exemplified in the list of three items containing the concepts ‘astral planes, energy fields and energy exchange’, borrowed from the original question by the journalist. The evaluative adverb ‘firmly’ generates the impression of rational and focused action, as opposed to irrational and incoherent activity. The adjective ‘appropriate’ generates an impression of the suitability of Finnish nursing scientific research to Finnish healthcare, and simultaneously produces the effect of a mismatch between American and Finnish nursing science. Finnish nursing science is presented as limited to the service of Finnish healthcare, and the unsuitability of American nursing science to the Finnish context is emphasised. The boundary-work between Finnish and American nursing science as a whole establishes the reputable nature of the Finnish nursing science community. The strong cultural differences are constructed so as to establish Finnish nursing science as reliable and pure.

The notions of ‘nursing science education in scientific universities’, ‘nursing science university-level scientific textbooks’ and ‘scientific university teaching and research in nursing science’ emphasise the scientific nature of nursing science. The repetition of the words ‘science’, ‘scientific’, ‘university’ and ‘scientific university’ generates the effect that the terms that connote science enhance the credibility of scientific work and guarantee the characteristics of science within the discipline. The use of the term ‘nursing science’ may be related to the process of development of nursing science terminology in Finland.

Jouni Tuomi (1997, 83), who has studied discussions of Finnish nursing science, argues that the terminological development through which ‘nursing science’ was established as the most usual term to define research on nursing and caring practice was not uniform, and that there were differences among early nursing scholars in their choice of terms. Tuomi discusses ‘nurse and nursing research’, ‘health and nursing research’, ‘nursing research’, ‘care research’, ‘nursing science research’, ‘health and illness research’ and ‘nursing scholarship’. According to an international evaluation of Finnish nursing science, the definition of the discipline varied between nursing science and caring science, depending on the institutional setting and on individual nursing scholars (Academy of Finland 2003, 58–83). The use of the term ‘nursing science’ may also have been enhanced by the translation of the term ‘medicine’ into Finnish as ‘medical science’

(*lääketiede*, as compared with ‘nursing science’, *hoitotiede*), instead of using just one word to describe the activity as in English or some other languages (e.g. German, French and Spanish).

Regardless of the causes of the terminological development of ‘nursing science’, in cases where the word ‘science’ is omitted from the term ‘nursing science’ in the Finnish-language context, the term refers to practical nursing rather than to scientific work, whereas in English-language contexts the term ‘nursing’ is also used for scientific curriculums at universities (for example, school of nursing, BSc in nursing, PhD in nursing). In Finland nursing departments in universities are called departments of nursing science or nursing science degree programmes, with the exception of one university department, the department of caring science at Åbo Akademi (Academy of Finland 2003, 21).³⁰ Taking into account these linguistic details, the *Sceptic* interview seems to generate a redoubled scientific effect, emphasising the scientific nature of the endeavour. However, even in the Finnish-language context, the repetition of the words ‘science’, ‘scientific’, ‘university’ and ‘scientific university’ duplicates the message and thus generate an impression of the need to establish the credibility of nursing science as a scientific activity and to emphasise that nursing science is able to handle the boundary between scientific and unscientific knowledge.

If the word ‘scientific’ is omitted before the term ‘university’, the institutions referred to may be confused with the universities of applied sciences (polytechnics) that had been recently established at the time of the therapeutic-touch conflict. The reform of Finnish higher education that led to the dual model of higher education under the University Act of 2003 was launched by a pilot project during 1992–1996, and the first universities of applied sciences began in 1996 with the merging of different vocational education institutions into conglomerates (Marttila 2010, 4). In the field of nursing, the reform meant that nurses who would previously have been educated in vocational healthcare institutions were now educated in conglomerates called universities of applied sciences. The term ‘scientific university’, used by the professor in the interview, reflects the changes to nursing education that were caused by the reform of higher education at the

³⁰ The term ‘nursing science’ is also used in this study to refer to the branch of science concerning academic teaching and research on nurses and nursing, for these reasons. As this term was an ideological choice on the part of previous researchers, I have chosen to use the term that the early developers of the field utilised themselves.

time, and constructs a boundary between scientific nursing education institutions and professional nursing education institutions.

As a whole, the *Sceptic* interview does identity work in nursing science by generating boundaries between Finnish and American nursing science. The Finnish version of nursing science is given positive connotations, and the American version is given negative connotations. The still young and developing Finnish nursing science is rationalised, and simultaneously the entrenched and suspicious American nursing science is irrationalised. American nursing science is produced as an 'other' that taints the image of nursing science, and as the enemy to be separated from 'we' who are trying to develop the identity of Finnish nursing science and establish it as a legitimate scientific activity. The power of the nursing science professor is used to justify the Finnish nursing science community's actions and to denigrate American nursing science and the author of the therapeutic-touch book.

The views of the professor of nursing science are legitimated. The author of the therapeutic-touch book – a nursing teacher and a former student of the nursing science department at the University of Tampere – is constructed as an undesirable mediator between American nursing science and Finnish nursing science and as a mistaken user of problematic models and ideologies. Thus the excerpt highlights the cultural differences between the Finnish and American nursing science contexts, and presents the identity of nursing science as culturally sensitive.

The last excerpt from the *Sceptic* interview is an answer to the journalist's sixth question: 'What does it tell us about healthcare education, and especially about higher education in nursing science, when teachers trained in it cannot distinguish methods of scientific research from pseudoscientific methods?' The question refers to the fact that the author of the book on therapeutic touch was at that time a teacher in a healthcare education institution. The question is provocative in style, indicating that nursing science should have oversight of teaching conducted by those who have been educated in nursing science departments. The professor answers:

Finnish nursing science has been in universities since 1979. Resources in small departments have been limited to organising and implementing scientific higher-education teaching. International scientific research activity is starting, although there is a lack of senior researchers. Finnish nursing science has worked hard in the past 16 years and dares to place

itself at the top in Europe, where we have something to offer to other collaborative partners, for example as coordinators in Erasmus and Socrates programmes. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

The first sentence assigns nursing science a temporal starting point – the year 1979 – when the first nursing science curriculum was launched in the form of the curriculum in healthcare at the University of Kuopio. The students were majoring at health and nursing care (Laiho 2005, 225). The departments from the early years of nursing science are described with the evaluative adjective ‘small’, giving an impression that resources have been tied to the organisation and implementation of teaching. The excerpt indicates that the discipline has not been able to develop other aspects for this reason. The verb ‘limited’ describes the organisation as being unwillingly forced to concentrate on certain aspects, rather than on others that could not be developed due to the scarcity of resources. The contrasting connective ‘although’ reveals the constraints on international research. International research activities are restricted by the ‘lack’ of senior researchers, which indicates the expectation that senior researchers enable the development of research. The identity of nursing science is presented as a heroic workhorse discipline operating with scarce resources.

After presenting the limitations to the ideal development of nursing research, the last sentence turns to the achievements of nursing science. The expression ‘hard’ implies that the efforts of nursing scholars have been considerable and industrious. The temporal expression ‘16 years’ quantifies the time period and adds to the impression of a small group of nursing scholars who have worked hard to build the discipline of nursing science in Finland. The notion ‘dares to place itself’ speaks on behalf of the whole of the Finnish nursing science community. The community is depicted as unified in its perception of itself as being at the top European level. With this notion the professor herself is neutralised. The nursing science community’s struggles for justification are emphasised. The justification is made from within the nursing science community, and the identity of the field is constructed as domestically industrious. Even though resources have been centred on building up the next generation of nursing scholars and there is a scarcity of senior scholars, international research of a high standard has been

established, and Finnish nursing science has gained a reputation internationally. Nursing science identity work is done to portray the struggles of the discipline and to establish its authority by presenting the respect it has gained from its international counterparts as self-evident.

The use of the pronoun 'we' implies that the nursing professor is not alone in the notion that the nursing science community has something to offer to scientific communities abroad, which presents the notion as evident and acceptable. It also generates an impression of Finnish nursing science giving more to others than it receives, which establishes the identity of Finnish nursing science as valuable to other nursing science communities, and presents its role as a central partner and coordinator that directs research and brings together many partners in collaborative projects. Thus the boundary between Finnish and European nursing science is constructed. European research partners are positioned as a unified group, which generates the notion that Finnish nursing science is at the top European level as a consensual understanding of the state of play in nursing science, powerfully quelling alternative interpretations of the state of the field. The boundary between Finnish and European nursing science acts to strengthen the status of Finnish nursing science and establish its authority in the broader European context. The professor's answer creates an impression that Finnish nursing science is heroic and has gained an international reputation through hard work in a short time.

It is characteristic of this form of intradisciplinary boundary-work to generate an impression of nursing science as a unified discipline with a uniform community of scholars. The uniform identity of nursing science is depicted as having been achieved in quite a short time through a lot of work by nursing scholars. The professor of nursing science does this identity work for nursing science.

The multiform identity of nursing science

The fourth form of intradisciplinary boundary-work portrays a multiform community of nursing science. This is found in the argumentation by the professor emerita of the University of Tampere. The professor emerita answers the questions posed by Perplexed Bystander. The professor herself was in charge of the department six

years before the conflict over therapeutic touch.³¹ It is possible that many of the researchers in the department at the time of the conflict in 1996 had been recruited or at least educated by the professor emerita, which gave her a special insider-outsider position in respect to both the decision-making processes of the department and the identity work of nursing science. The professor emerita's answer starts with expressions of appreciation that Perplexed Bystander should be enquiring about such broad questions concerning the grounds of the discipline. Then the text moves on to explain the Masters thesis process in nursing science as a negotiation between the student and the supervisor. It states:

The situation at the department described by Bystander looks like a deadlock because ideological questions concerning the implementation of teaching are being processed at an administrative meeting. The discussion of these questions should belong to teachers' meetings, Masters thesis seminars and occasions in postgraduate scientific education when issues are considered from many different perspectives and reasons are given for the decisions. In this case the decision, at least the part concerning the New Age movement, is hard to follow, because the concept does not have an unambiguous meaning.

Constructing such a vague norm for literature used in Masters theses hints at an internal crisis in the department. The researchers who supervise the theses do not have the open discussion and enthusiastic scientific argumentation that is often found in a vibrant research community. Having an open discussion of the issues in this situation would be a better decision than setting a vague external norm. (Kalkas, Hertta 1997. Ethical dilemma column 'What are the ethics of research and teaching in nursing science like?' Question by Perplexed Bystander. *Sairaanhoidaja [Nurse]* 70 (2), 32, 21.2.1997)

The expression 'at the department' localises the situation and presents the norm-production process as limited to one specific department. This presents the argumentation as being focused not on the whole discipline, but on the local practices of one department.

The excerpt constructs two different scientific communities: a deadlocked scientific community and a vibrant scientific community. The characterisation of the former as 'a deadlock' is a metaphorical expression suggesting a research group stuck in certain opinions, in

³¹ She was a senior assistant in 1982–1983, associate professor in 1983–1987 and professor in 1987–1990 (Kalkas and Åstedt-Kurki 2003, 263).

which the key for opening up the discussion to allow different viewpoints to emerge has been lost. The situation of the department is described by referring to 'conflict', connoting different entangled opinions. With the negation 'do not have', the expectation of open discussion is presented, and by contrast open discussion in a deadlocked community is depicted as non-existent. The regulatory activities of the deadlocked scientific community are presented as the vague setting of external norms by only some members of the community. The argumentation could be characterised through the adjective 'apathetic' as a contrast to 'enthusiastic', which is used of the vibrant community. The deadlocked scientific community in the excerpt is associated with negative connotations: it is presented as 'closed' instead of 'open', 'deadlocked' instead of 'free' and in 'conflict' instead of 'agreement'. Thus the local scientific community appears in an unfavourable light.

As a contrast to the deadlocked community, the vibrant scientific community is described as including analyses of the issues from many perspectives in lively discussions. In a vibrant scientific community, reasons are given for conclusions and their basis is argued for. The impression of the openness of the community's scientific discussions is emphasised by the list of three occasions on which ideological questions ought to be discussed. With the conditional expression 'should belong' it is argued that in an ideal community these issues are discussed in teachers' meetings and graduate and postgraduate seminars, which presents the notion as a recommendation for the future development of nursing science. It is also advised that many perspectives should be taken into account, which generates the inclusion of different perspectives as an ideal model for nursing science discussions. Argumentation in a vibrant scientific community is characterised by the adjective 'enthusiastic' rather than 'apathetic', which gives the vibrant community positive connotations. With the comparative 'better' the vibrant scientific community is presented as the ideal for nursing science communication. Thus the vibrant scientific community is presented in a favourable light.

In sum, the ethical dilemma column juxtaposes vibrant and deadlocked scientific communities. The nursing science scientific community ideal is presented as the vibrant scientific community, and the local nursing science department is depicted as a deadlocked community in crisis. The column suggests that nursing science should be developed as a vibrant scientific community, in which the

discussion is lively and takes many different perspectives into account. The current scientific community's crisis situation is constructed as undesirable for the development of the discipline. The column points out the weaknesses of the scientific community in crisis, and warns the scientific community of the unfavourable development of the field if these wrongful practices are adopted as general practices in nursing science. The scientific community ideal is constructed on the basis of the notion of a diversity of opinions, rather than of a perception of unanimity. The nursing science community is described as a potential breeding ground for undesirable boundary construction characterised by dogmatism.

The professor emerita continues:

The task of the professor who acts as leader of the department is to establish the economic and administrative prerequisites for the functioning of the department, to lead the planning of teaching, and to be responsible for postgraduate scientific education. The department leader also has a great influence on the working atmosphere in which teaching and learning happen. Nursing science is a young discipline at the university, and its qualified researchers have different perceptions of the ideology of the discipline (research subjects, research methods, rules for making deductions etc.). Researchers, as well students, have qualitatively and quantitatively very different experiences of nursing work in practice. The teachers might for this reason have diverse research interests. In order to maintain the multiformity of teaching, it is important that the distribution of work between teachers is based on recognising and utilising this disparity. (Kalkas, Hertta 1997. Ethical dilemma column 'What are the ethics of research and teaching in nursing science like?' Question by Perplexed Bystander. *Sairaanhoitaja [Nurse]* 70 (2), 32, 21.2.1997)

The excerpt starts by highlighting the role of the departmental leader and personifying the working atmosphere in her actions. The repetition of the person, the 'leader of the department', also emphasises the leader's role as particularly constructing the prerequisites of work and the working conditions of other members of the team, and thus entrusts the well-being of others to the leader. As this is a role formerly held by the author herself, the notions also sum up the professor emerita's perceptions of the ideal of nursing science leadership, and perhaps also her own thinking about scientific leadership. It can also be interpreted as a commentary on or criticism of the decision made by the departmental committee and by those who currently hold leadership positions, which may reflect a

generational change in the department: the professor emerita versus the new generation of professors, past practices versus current practices.

In the excerpt the leadership role is closely tied to the specificities of nursing science. The evaluative adjective 'young' illustrates the youth of nursing science and gives the impression of the identity of the field as a discipline with many different perceptions of disciplinary identity. The repetition of the adjective 'different' in connection with 'perceptions' and 'experiences', and the use of the adjective 'diverse' in connection with 'research interests', construct the discipline of nursing science as a multiform discipline with many different interests and voices. With the list of three items presented in parentheses, the disciplinary identity is depicted as tied to the ideological orientations of individuals. The perceptions are illustrated as differing in their views of research subjects, their application of research methods and their understanding of the rules for making deductions, which are all fundamentals of research work affected by the ideological background of the researcher. The abbreviation 'etc.' at the end of the list indicates that the list is even longer than the three items mentioned, but that for reasons of lack of space not all aspects have been included. The abbreviation emphasises the importance of the differences and presents nursing science as a diverse discipline with multiple approaches and voices.

The notion of the quality of background work experience in practical nursing anchors the disciplinary identity of nursing science in the different fields of tasks, job descriptions and specialisations in nursing work. The quantity of work experience connects with the temporal duration of the work experience and the variety of working arrangements (part-time work, intermittent work and the length of work periods) in practical nursing. The notion may refer to the requirement on nursing science curriculums that applicants must be qualified and registered nurse practitioners with a specialisation in some area of nursing (medical-surgical nursing, midwifery, public health nursing or psychiatry) (Regulation 24.8.1984/626). However, the work experience of nursing science applicants is not defined in legislation. Thus some of the nursing students and scholars may have had long work experience in several healthcare environments, whereas others might have had no work experience other than that gained during professional nursing studies. The diversity of work experience outlined by the professor emerita generates the impression that

nursing science is closely tied to nursing practice, and that these varying ties fundamentally define the disciplinary identity of nursing scholars and explain the diversity of research interests.

The last sentence of the excerpt returns to the role of the leader and indicates that the task of 'recognising and utilising' diversity belongs organically to the nursing science leader. This constructs the ideal nursing science leader as accepting the multiformity of the discipline and seeing it as an advantage, which constructs that multiformity as a desirable asset for nursing science. The last sentence also links nursing science leadership with multiformity: the leader must know how to take advantage of multiformity, of different interests, experiences and perceptions, and how to bring together that multiformity in a functional working atmosphere.

It is characteristic of this form of intradisciplinary boundary-work to illustrate the multiformity of nursing science with versatile interests stemming from different perceptions of scientific work and different experiences of nursing practice. Multiformity is presented as a desirable element of the field, to be maintained by the nursing science leader, whose role is seen as essential for providing continuity for the tradition of diversity. This form of boundary-work is done by the professor emerita, and it contrasts with the uniform identity depicted by the professor in the *Sceptic* interview.

Nursing science in intradisciplinary boundary-work

Intradisciplinary boundary-work clarifies disciplinary practices, particularly regarding theses within the discipline. It articulates disciplinary principles for good research. Intradisciplinary boundary-work distinguishes between the characteristics of good and poor scientific communication. It negotiates insiderhood and outsiderhood of the scientific community, and defines those who can outline the norms and practices of nursing science and those who cannot. It characterises the scientific community of the discipline by presenting the discipline as uniform or multiform. Intradisciplinary boundary-work separates and evaluates different schools of thought within the discipline.

Intradisciplinary boundary-work characterises the disciplinary community in two ways, as uniform and as multiform. The sociologist

of science Thomas Gieryn has studied how social sciences are on some occasions presented as undivided and on other occasions as having disintegrated (Gieryn 1999, 109). The differences in the texts' argumentation strategies may be partly due to their different contexts. The sociologist of science Olga Amsterdamska (2005, 46), who has studied the processes involved in the construction of the discipline of epidemiology, claims that argumentation during the discipline-building changes, depending on the extent to which the discourse is addressed to the 'inside' of the discipline and its actual practitioners. The texts by the incumbent professor are targeted at the outside of the discipline on an occasion when the field is being directly challenged, and seeks to specify the characteristics of nursing science for the 'foreign' eyes of both medicine and the sceptics. By contrast, the text by the professor emerita is targeted at insiders of nursing science, at actual practitioners and various nursing scholars, to make them aware of the differences and tensions within the discipline. Thus the texts by the incumbent professor show a willingness to participate in a scientific health research community dominated by medicine, whereas the text by the professor emerita shows solidarity with the insiders of the field and their different definitions and perceptions of that field.

The intradisciplinary boundary-work arguments present nursing science as a strong, independent discipline with good capabilities for boundary protection. They reflect the implicit aim to close down the controversy over the Humbug Award and the ban on certain nursing theories by presenting the discipline as a strong and clearly defined territory. The argumentation presents nursing science as a precise scientific discipline, the practices of which are protected and clearly defined. It establishes nursing science as a high-level ethical discipline that guards its boundaries meticulously through ethical principles. It highlights the discipline's internal practices for distinguishing good from bad science, and correct from poor and incorrect science. Nursing science is linked with the broader scientific community through philosophy and ethics, which are taught worldwide in all disciplines and countries alike. The vocabulary of unified nursing science is also used to present the field as impersonal, and as not dependent on any department or academic affiliation. Nursing science is presented as a discipline that guards its boundaries from the perspective of nursing scholars in front of students, other staff, the general public, nurse practitioners and nursing scholars in Finland.

The second characterisation presents the multiformity of nursing science and generates understanding of the field of nursing as a whole. The starting point is that nursing science as a young discipline is characterised by many different perspectives all flourishing simultaneously. In this characterisation, many different groups shape nursing science. The multiformity is presented as the essence of the field, stemming from nursing practice and the fundamental entanglement of nursing with nursing science. Thus the boundary between science and practice is seen as porous, and nursing scholars as inextricably linked with nursing practice. The argumentation also considers the actors who have or should have the power to define the boundaries of scientific endeavour. It highlights the identity work of nursing science as a negotiation process sparked by the different starting points, views and perceptions of nursing scholars in the nursing practice context. The department of nursing science that decided to ban certain books is characterised as a restricted and closed community of scholars with undesirable and unnecessary boundaries, where there is no room for open curiosity or dynamic and vibrant discussion about different schools of thought.

Third, the argumentation reveals qualities of the Finnish tradition of nursing science in particular. Finnish nursing science is characterised as having clear boundaries with other cultural contexts. American and European nursing science are depicted as different from the Finnish tradition. In this argumentation, the Finnish nursing science community is referred to as one unit, and the identity of Finnish nursing science is generated by contrasting it with other contexts. Sloppiness and negligence in relation to ethical rules is presented as characteristic of American nursing science, the diversity of which is hidden in the argumentation. The industriousness of Finnish nursing scholars is demonstrated by referring to their work as diligent and exemplary. The identity work of domestic nursing science positions the Finnish disciplinary tradition as ahead of the international tradition, and produces the identity of the Finnish field as uniform by contrast with other cultural contexts. Finnish nursing science is presented as facing a dilemma when building its international contacts: American textbooks are of high quality, but some of them are tainted with undesirable unscientific elements; Finnish nursing science is excellent and independent, but it is also young and dependent on the international community of nursing scholars.

Nursing science is referred to as a new discipline in the forms of intradisciplinary boundary-work that construct the unified and the multiform community of nursing science. On the one hand, nursing science is characterised as having the prerequisites for development into a unified community. In this type of argumentation, nursing science is presented as already having achieved much. On the other hand, it is shown that, as is characteristic of a new discipline, nursing science has a diversity that is valuable and worth preserving as such.

Interdisciplinary boundary-work

This chapter presents my analysis of interdisciplinary boundary-work in the conflict over therapeutic touch. Interdisciplinary boundary-work was found to take four forms: locating the discipline in the system of disciplines, expressing apprehensions about the reputation of the discipline in disciplinary relations, depicting potential disagreements with other disciplines, and comparing the discipline's authority with the authority of other disciplines. Interdisciplinary boundary-work was found in the *Sceptic* interview, the student bulletin article, the university bulletin article and the medical journal article.

Location in the system of disciplines

The first form of interdisciplinary boundary-work locates the discipline of nursing science in the system of disciplines. This form was found in two excerpts from the *Sceptic* interview. The excerpts are taken from the professor's answer to the seventh interview question. The question concerns the intentions of the therapeutic-touch book to bring the concept of energy closer to practical nursing work and to make concrete the abstract ideas of nursing science. The question was: 'Is the teaching of nursing science then so theoretical that higher education students cannot see the possibilities of its application to practical nursing and for this reason seek knowledge from reiki and other such courses?' The professor starts her answer by stating that she does not understand what the therapeutic-touch author means by the practical applications of the concept of energy. She then proceeds to identify the status of nursing science among other sciences:

Naturally, the teaching of nursing science in a scientific institution of higher education is theoretical and methodologically sound, just as in the other sciences, and so it should be. Nevertheless, nursing science, like medicine, is an applied science, and with common sense the teachings of nursing science are applicable to practice, although this certainly requires work and the proper adoption of theory. [...] Indeed, nursing science exists in universities as a discipline so as to bring high-grade experts and researchers into healthcare, alongside and in collaboration with medicine, for quality patient care and health promotion. Numerous good experiences have already been gained from this during the last 10 years, for example in joint research projects between medicine and nursing science, and development programmes for healthcare. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

The expression ‘scientific institution of higher education’ refers to the dual model of higher education in Finland, and emphasises the distinction between the professional education of nurses in polytechnics and the scientific education of nurses in universities. This highlights the extent to which nursing science belongs to the scientific community, and generates the effect that the scientific sphere of knowledge is separate from the professional. Thus the reference to the ‘scientific institution of higher education’ generates a boundary between professional knowledge and scientific knowledge. The adverb ‘naturally’ conveys that because nursing science teaching is done inside universities, it is logical and understandable that the teaching should be theoretical and methodologically sound. This presents the theoretical nature and methodological soundness of science as a self-evident and generally accepted fact. The adverb ‘naturally’ therefore generates acceptance for the status of nursing science as a scientific discipline.

The evaluative adjective ‘sound’ implies an expectation that if nursing science were not at university level, the teaching of the discipline would need to be neither as theoretical nor as methodologically strong as it is currently. This also generates the impression that nursing science outside the university might be atheoretical, practical and methodologically weak. The characteristics of science as theoretical and methodological are highlighted and contrasted with a situation in which nursing science would not be taught at the university level and, as a consequence of the lower level of theorising, the education would be more practical and functional.

The expression 'just as' compares nursing science with other disciplines and presents nursing science as belonging to the scientific community. The characteristics of science are produced as universal and unified in all disciplines, which creates acceptance for nursing science as a part of the scientific community, concentrating on abstract rather than concrete thinking.

The expression 'nevertheless' implies the reservation that despite the theoretical nature of nursing science and its belonging to the scientific community, it is a discipline that should be differentiated from some other sciences. With the evaluative adjective 'applied', nursing science is categorised as a discipline whose results have practical implications and applications. With the preposition 'like' nursing science is paralleled with medicine, both belonging to the applied sciences. The association of these disciplines with applied sciences may reflect how academics view disciplines according to their degree of applicability to practical problems along the dimension of pure-applied, where 'pure' refers to disciplines with less concern for the application of knowledge and 'applied' refers to disciplines with a strong concern for the applicability and relevance of knowledge in some practical settings (Becher 1989, 11). Thus the excerpt establishes the authority of nursing science by paralleling it as a scientific field with medicine, and by presenting nursing science as an applied field where the application of knowledge to the care of patients is highly valued by scholars.

The nature of nursing science as an applied discipline is further enhanced with the evaluative expression 'with common sense', associating nursing science's theoretical thinking with mundane thinking that does not require special theoretical abilities; instead one is required to understand the practical work setting in order to develop something theoretical. The adverb 'certainly' and the evaluative adjective 'proper' imply that the amount of work and the adoption of theoretical approaches rest on one's bothering to take the time and effort to understand the findings of nursing science. This lowers the threshold for actors in the practical domain to get acquainted with nursing science. The excerpt first constructs the boundary between theoretical and practical knowledge, and then blurs the boundary by describing the theoretical as understandable with common sense. The excerpt normalises theoretical knowledge and emphasises the trouble taken by the person who is trying to adopt theoretical aspects in practice as a central asset. These notions also generate an

understanding of the efforts required for adopting theoretical and methodical knowledge in practice.

Through the word 'indeed', the argument is factualised and the reason for nursing science's presence in universities is presented as a widely accepted fact. The expression 'alongside' gives the impression that nursing science is equal with and has the same status as medicine, both in the scientific community and in healthcare. The notion 'in collaboration' gives a connotation of nursing science and medicine as equals working together and striving to achieve the same targets of quality care and health promotion. The evaluative adjective 'high-grade' suggests that scientific and theoretical aspects add quality and expertise to healthcare. The adjective 'quality' implies that a high level is an expected and desirable characteristic of healthcare, and scientific research is presented as contributing straightforwardly to patient care. This generates the acceptability of the existence of scientific research and the credibility of the relevance of scientific research in practical settings. Nursing science is legitimised by coupling its relevance with that of medicine and with the altruistic goals of patient well-being and health promotion in healthcare institutions. The action thus persuades the general reader to accept nursing science as an applied science, and calls for public understanding of the high goals of nursing science, together with medicine, to seek scientific solutions for public health problems.

The idea of the collaboration between nursing science and medicine is justified by quantifying the collaboration with the expression 'numerous'. This notion maximises the collaboration as frequent and long-standing. This effect is furthered with the temporal expression 'during the last 10 years', which quantifies the collaboration and presents the relationship between nursing science and medicine as long-standing and well established. The evaluative adjective 'good' suggests that the collaboration could have proved unsuccessful but instead was fruitful. The evaluative adjective 'joint' presents the disciplines of nursing science and medicine as tied to each other in their collaborative research and development projects in healthcare. The expression 'for example' in front of the medicine and nursing science collaborations in research and development generates an impression of the numerous ways in which medicine and nursing science collaborate and implies that the list of research and development projects might be longer if all the collaborations were to be included. However, the listing is not made for reasons of lack of

space or time, which generates an impression of the regularity of the collaboration.

The answer to the seventh question in the *Sceptic* interview goes on to illustrate the differences between education levels and the difficulties of drawing the boundaries between different educational institutions. These answers concerning the distribution of responsibility will be analysed in the discussion of the boundary-work between science and society in the third subchapter. At the end of the answer, the professor presents different aspects of the relationship between nursing science and medicine:

In addition [to the previously demonstrated difficulties of drawing the boundary between education levels], all activities related to nursing seem to be called nursing science at the moment. I have often run into situations where for example representatives of medicine have criticised with amazement – and justly so – a narrow survey-based thesis as a thesis in nursing science. Closer scrutiny has nonetheless proved the thesis in question to have been done at college level. However, all these are easily considered as belonging to nursing science, even though they are not. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

The first sentence utilises the extreme expression ‘all’, presenting an expectation that not all things related to nursing will be named nursing science. The notion implies that absolutely everything related to nursing is at present regarded as nursing science, which maximises the effect of connecting nursing with nursing science. This demonstrates the boundary between practical nursing and nursing science, and accentuates the separation of nursing as a practice from nursing as a scientific activity. The extreme expression ‘all’ produces the impression that the activities of nursing are regularly called nursing science. Thus the expression normalises the designation of nursing as nursing science as a habitual reaction to activities related to nursing. The temporal expression ‘at the moment’ restricts the situation to the present and reinforces the accurateness of the argument that all activities related to nursing are connected with nursing science.

The quantification in the form of the adverb ‘often’ presents the situation as frequent and continual, which gives the impression that nursing science is frequently evaluated by other disciplines and especially by medicine. The personal pronoun ‘I’ indicates that the professor herself is engaged in the situation and emphasises her

personal experience in the role of a nursing science professor. Thus the reader is led to see through the eyes of the nursing science professor a situation in which some representatives of medicine are looking at a thesis and criticising it while the professor is sitting close by and is ready to answer their criticisms. The situation ends when the nursing science professor checks the thesis and corrects the understanding of the others – the representatives of medicine – by pointing out that the thesis is not a nursing science thesis but originates from below university level.

The expression ‘for example’ in front of the representatives of medicine indicates that representatives of medicine are not the only ones who draw such conclusions, and suggests that situations like this also occur with representatives from other disciplines. However, the choice to refer to representatives of medicine indicates that the situation described most typically happens with them. The verb ‘run into’ in the second sentence implies that the professor has unwillingly or involuntarily been forced into the situations described, which explicates her frustration about the misunderstandings of the differences between theses in universities and other institutions of higher education. The representatives of medicine are described through the adjectival phrase ‘with amazement’, indicating their surprise at the narrowness of the thesis, which they categorise as a thesis in nursing science. The adverb ‘justly’ implies that representatives from other disciplines have the right to criticise theses produced in nursing science. The representatives of medicine according to the excerpt do not recognise the differences between theses written at other institutions of higher education and those produced in universities, and thus they mistakenly categorise the thesis in the example as a nursing science thesis. The role of the nursing science professor in this situation is to correct the representatives of medicine and tell them that the thesis cannot be considered representative of nursing science.

The adverb ‘nonetheless’ demonstrates the expectation that the thesis should belong to nursing science; instead the expectation is proved wrong, and the thesis belongs to the nursing training provided in higher-education institutions other than universities. This establishes a hierarchy between the university and other types of higher education, and separates them from each other. Nursing science as a whole is dissociated from other forms of higher education, and an institutional barrier is built between the university

and other educational institutions. The notion makes concrete the differences between educational levels and shows how this is actualised in the outcomes of the thesis production processes. The use of the adverb 'however' generates the impression that despite the differences' obviousness to nursing scholars, the representatives of medicine do not see the differences and consider the theses as belonging to nursing science. The effect is furthered with the evaluative adverb 'easily', indicating that the assessment as to whether a thesis belongs to nursing science or not is made lightly by the representatives of medicine, which demonstrates the outsiders' unfamiliarity with the discipline of nursing science. This generates an impression of unfair judgement on the part of the representatives of medicine. The extreme expression 'all' also creates the effect that many theses are linked with nursing science and demonstrates disciplinary outsiders' difficulties in seeing the differences between nursing and nursing science. The negation in the last sentence strengthens the impression that the consideration of theses produced at other higher-education levels as nursing science is a mistake made by other disciplines.

The argumentation illustrates from the point of view of the nursing science professor what nursing science looks like to other disciplines, and grants the authority to evaluate nursing science to other disciplines, especially medicine. However, the personification of the story in the nursing science professor also depicts nursing science's struggles to show to other disciplines what the boundaries of nursing science are like and the difficulties the education system causes for the field. The excerpt also demonstrates the specifics of the nursing science educational path through the different educational institutions, and compares it with the straight educational path of medicine, in which all education is provided at university level. The story about confusing theses from lower-level institutions with those from the university highlights the authority of representatives of medicine and their ability to make statements about nursing science theses. This accentuates the supremacy and power of medicine and other disciplines to criticise nursing science theses. The power of nursing science to criticise medicine or other disciplines is not discussed, and thus the relationship appears to be non-reciprocal. The excerpt differs from the previous excerpt, in which the disciplines of nursing science and medicine were presented as equals; instead medicine here has authority over nursing science and the relationship appears to be

unequal, highlighting the hierarchies of the system of disciplines. The hierarchical relationship between nursing science and other disciplines – most explicitly medicine – is taken for granted and is not criticised as such; however, the relationship is shown to be hampered by the existence of several educational levels in nursing science.

It is characteristic of this form of boundary-work to locate the discipline of nursing science within the system of disciplines by describing it as an applied discipline and depicting its relationship with medicine as close. However, the argumentation also reveals that the close relationship with medicine is not always easy but requires explanations on the part of nursing science. The system of disciplines is seen solely as a relationship with medicine, and other disciplines are not discussed.

Apprehensions about reputation in disciplinary relations

The second form of interdisciplinary boundary-work involves apprehensions about the reputation of nursing science in relation to other disciplines. This is found in a student bulletin article. During the years 1996–1997 the bulletin was distributed to nursing science students at the University of Tampere's department of nursing science once or twice a year, depending on the activity of the students. The bulletin contained articles written by nursing science students that reflected their studies in nursing science and related their international study experiences and conferences. It also frequently included letters from the nursing science staff at the University of Tampere.

The student bulletin article is a letter by the professor of nursing science. The overall theme of the article is change. The article was published in the second bulletin of 1996, which came out right after the Humbug Award. First the theme of change is discussed in the context of universities as institutions, and it is argued that change leads to the faster graduation of students. Then the theme is discussed in the context of healthcare institutions, where change is seen to mean more quality-driven care. After this the professor moves on to the changes through which nursing 'seeks a special knowledge area of its own'. This process of change, according to the professor, is characterised by drawing on theories brought in from elsewhere, and the professor warns that these borrowings might affect the reputation of nursing science. In connection with this the professor argues:

It is unfortunate that our good ambitions may if used uncritically evoke great astonishment in the representatives of other disciplines and almost lead to the pillorying of our activities, nor do they serve the good care of our patients. (Paunonen, Marita 1996. Various thoughts about change! *Epione* [Nursing science student bulletin] 2/96)

The adjective ‘unfortunate’ presents the situation in nursing science immediately after the Humbug Award as troublesome and regrettable. This generates an impression that the situation is bothersome from the point of view of the professor. The adjective ‘good’ in front of ‘ambitions’ implies that the aims behind the activities are sincere, and as such are favourable to nursing science. The adverb ‘uncritically’ indicates that if the ambitions had been critically assessed, the consequences would not have been so unfortunate, and the astonishment evoked would have been less than was actually the case. The notion ‘great astonishment’ is an extreme expression which indicates that other disciplines continually evaluate the activities of nursing science and are astonished if something is out of order according to the principles of the scientific community. The word ‘pillorying’ gives the impression that other disciplines are laughing at nursing science and see nursing science as ridiculous, impossible and senseless. The negation ‘nor’ gives the impression that the ultimate ambition of nursing – good patient care – will also get ridiculed in the process if nursing science does not guard its reputation.

It is characteristic of this form of interdisciplinary boundary-work to express apprehensions about the reputation of nursing science in the eyes of other disciplines. These notions construct the relationship of nursing science to other disciplines through ‘others’ acceptance of ‘us’.

Potential disagreements with other disciplines

The third form of interdisciplinary boundary-work presents nursing science’s potential disagreements with other disciplines. These were brought up by the university bulletin article. This is an article by a journalist from the scepticism movement in *University*, the news bulletin of the University of Helsinki. First the university bulletin article summarises the central elements of the therapeutic-touch book. Second the article interviews the supervisor of the Masters thesis on which the therapeutic-touch book was based. Third the article

discusses therapeutic touch in the United States context. Finally the journalist interviews the professor of nursing science at the University of Helsinki and discusses therapeutic touch in the Finnish university context. The excerpt about the relationship between nursing science and other disciplines is taken from the section discussing therapeutic touch in the United States context:

The [therapeutic-touch] theory attracted condemnation in the scientific community of the United States, but the critique has not been able to stop its spread. At the beginning of the decade a five-member committee led by Henry Claman, the professor of immunology at the University of Colorado, analysed the scientific efficacy of the treatment and ultimately suggested that it be removed from the curriculum of the University of Colorado because it lacked scientific evidence. In spite of this authoritative group of researchers, which included some of the university's own researchers from outside nursing science and some representatives of nursing science from other institutions of higher education, the teaching was able to continue because it was seen that this type of outside intervention in the internal affairs of a discipline threatened 'academic freedom'. (Ollikainen, Marketta 1996. *Spiritual healing for nurses? Yliopisto [University] 20/96, 38–39*)

The first sentence uses the negation 'has not been able to stop', giving the impression that criticism of a theory can be expected to lead to the prevention of the theory from spreading further in the scientific community. The excerpt utilises a narrative which is located in the University of Colorado and temporally specified to the beginning of the 1990s. The narrative makes visible one local gatekeeping episode inside the scientific community of the University of Colorado.³²

The five-member committee is presented as having prestige, and the prestige is demonstrated by emphasising that the committee consisted of the head of medicine and of representatives from other disciplines as well as nursing science. The medical specialism is specified as immunology. The specialisms of the representatives from other disciplines are not specified, which highlights the specification of immunology and creates the impression that in order to gain credibility for the article it was important to state the area of medical specialisation. The representatives of nursing science are defined as

³² Most likely it was Professor of Nursing Jean Watson and Associate Professor Janet Quinn who organised courses at the time of the episode. In 2013 caring science activities and courses were organised in a separate private organisation, a foundation called the Watson Caring Science Institute (Watson Caring Science Institute 2013).

being from elsewhere than the University of Colorado. Through the description of the multidisciplinary team that criticised the teaching in the local community, it is demonstrated that nursing science faced criticism from both inside and outside the discipline. The authority of other disciplines, most explicitly medicine, is used to demonstrate the introversion and isolation of the local community within the scientific community. The excerpt portrays the stubbornness of the local community in the face of the committee. The inclusion of nursing scholars on the committee generates an impression of disunity among nursing scholars in their understanding of the boundary between the scientific and the unscientific, as the local nursing community is depicted as opposing the decision to stop teaching on therapeutic touch, and it is suggested that the external nursing community is in accord with the critique by medicine and other disciplines.

The expression 'in spite of' indicates the expectation that, as a consequence of the criticisms from such a prestigious committee, nursing science should have stopped teaching therapeutic touch. The terms 'scientific efficacy' and 'scientific evidence' connect the criticisms with medicine and its way of formulating the boundary between the scientific and the unscientific. However, the excerpt implies that the expectation that a teaching programme that lacked scientific evidence would be closed down was not met; instead the local nursing science community decided to continue the teaching of therapeutic touch. This contrasts the inner circle of the University of Colorado's local community with nursing scholars from other universities, scholars from other disciplines and biomedical specialists. Thus the local community is portrayed as a stubborn and inward-looking body which, despite the authority of other members of the scientific community, adheres to its own scientific criteria for scientific efficacy and evidence.

It is characteristic of this form of interdisciplinary boundary-work to present potential disagreements with other disciplines. The example from the United States is presented as a warning example of the potential for nursing science to break the boundaries between science and non-science and to depart from the rules of the scientific community. The rules of the scientific community are presented as universal, common and binding to all. Medicine is seen as setting an example for other disciplines.

Comparing the disciplinary authority of nursing science with authority of other disciplines

The fourth form of interdisciplinary boundary-work compares the authority of nursing science with that of other disciplines. This form of interdisciplinary boundary-work was found in the medical journal article. The article was written by two medical specialists in the *Finnish Medical Journal*, the professional journal for medical practitioners. The journal is targeted at Finnish medical practitioners, medical students and other healthcare professionals, and contains refereed articles on original research, review articles, news from the Finnish Medical association, discussion articles and book reviews. The article by the two medical specialists is a discussion article on healthcare. The article was published half a year after the Humbug Award.

The medical specialists first define 'belief medication' as a term, then they discuss the treatment of therapeutic touch and its basis in nursing science, and after that they move on to perceptions of holistic care. The last section of the article summarises the practical problems of therapeutic touch and also makes statements about the relation of nursing to other disciplines. The last section of the article is under scrutiny here, and it will be analysed in two excerpts. The first excerpt starts with the key aspects of therapeutic touch:

The key component of therapeutic touch is not the efficacy and safety evidenced by research, but its many characteristics typical of belief medication. Other belief medication treatments, including iris diagnostics among other things, are also sold in the advertisement section of the journal *Tehy* – as far as we know, only medical doctors have visibly reacted to these. In a similar way, the supposedly universal and rapid diagnostic electro-acupuncture is advertised broadly. (Saano, Veijo and Puustinen, Raimo 1997. Belief medication – the new direction for nursing? The example of therapeutic touch. *Suomen lääkärilehti [Finnish Medical Journal]* 18–19, 2306)

The negation 'is not' in the first sentence presents an expectation that therapeutic touch should be backed up by research, but the expectation is not met and the efficacy and safety of the treatment has not been proved by research. The key aspects of therapeutic touch are described as typical of belief medicine, and thus the treatment is connected in the excerpt with beliefs rather than with the proofs required for medical treatments. The expression 'among other things' in the second sentence implies that many belief medication treatments

are advertised in *Tehy*, a journal of the trade union for health and social care professionals. The union aims to safeguard the interests of these professional groups, to campaign to improving their working conditions and education, and to represent them in wage negotiations (Tehy 2012).

The caveat that ‘only’ medical specialists have reacted to these advertisements reveals an expectation that advertisements in the professionals’ journal should be strictly controlled by nurses and nursing scholars, and that no belief medication advertisements should be presented in the journal. The adjective ‘visibly’ connotes the expectation of a broad-ranging reaction from nurses and nursing scholars. The notion also presents medical practitioners as a professional group who do a good job of guarding against belief medication. The implied comparison between nurses and nursing scholars on the one hand and medical doctors on the other underlines medicine’s abilities to protect the boundaries of the discipline against non-science, and the shortcomings of the nursing scholars in not protecting the boundaries of the discipline. The notion thus makes an assumption that nurses and nursing scholars should strengthen the boundaries of medicine by rejecting the advertisement of unscientific treatments in journals in their field. The assumption constructs nursing science as an assistant in the boundary-protecting work of medicine, and does not expect nursing science to have its own separate areas of boundary negotiation. In the comparative setting, nursing science is thus constructed as a weak discipline that neglects its boundary-protecting responsibilities.

The comparison between nurses and medical doctors may relate to the differences in the trade union background of nurses and medical doctors. At the time, medical professionals tended to belong to one single trade union, the Finnish Medical Association, regardless of their level of education (medical student, registered medical practitioner, specialist, researcher), and their main professional journal was the *Finnish Medical Journal*. There were no separate curriculums at universities or other educational institutions for medical teachers or medical administrators; instead these were taught to medical practitioners on individual courses organised outside educational institutions, for example by scientific societies. Thus there were no separate associations for medical doctors in administration or education, and consequently no separate journals for them.

Nursing professionals tended to belong to several different trade unions and professional associations, depending on their level of education or professional position. Practical nurses mostly belonged to the Finnish Union for Practical Nurses (Super). Nursing professionals –registered nurses and similar occupations – tended to belong to the Finnish Nurses' Association and the Union of Health and Social Care Professionals (Tehy). Nursing teachers to a large extent belonged to Teachers of Social and Health Care (Sto), and nursing administrators to Academic Leaders and Experts in Health Sciences (Taja). All these trade unions except Sto had their own separate journal, called *Super*, *Tehy* and *Pro terveys* respectively. The excerpt about nursing scholars reacting to advertisements in the journal *Tehy* expects nursing scholars to react to all levels of nursing education and to the relevant trade union journals in relation to questions concerning the boundary between the scientific and the unscientific in medicine, and presents nursing science as passive in relation to the journals of the profession-based trade unions.

The medical journal article argues:

In the medical profession too, interest in the most various forms of belief medicine is noticeable. Nursing science and the nursing profession are nonetheless facing a new, perhaps bigger challenge here than the medical profession and medicine. Nursing science's field of operations does not seem stable, and thus phenomena such as therapeutic touch can become established in nursing, and even in the academic sphere of that name. (Saano, Veijo and Puustinen, Raimo 1997. Belief medication – the new direction for nursing? The example of therapeutic touch. *Suomen lääkärilehti* [Finnish Medical Journal] 18–19, 2306)

The adverb 'also' equates the medical profession with the nursing profession in that they both include interests in belief medication. The quantifying expression 'most various' maximises the variety of the forms of belief medication and indicates that they are an important problem in medicine. The reservation expression 'nonetheless' gives an impression that, despite the parallel situation of a multitude of forms of belief medication, the fields of medicine and nursing differ from each other in terms of the size of the challenge presented by belief medication. The challenge for nursing science is depicted as 'new' and 'perhaps bigger', indicating that for the medical profession and the field of medicine this is an old problem of controllable size, whereas for nursing and nursing science the problem is being faced

for the first time, and it is suggested that the problem is less controllable in size. The comparison continues in the last sentence, in which the negation 'does not seem' gives the impression that nursing science is an unstable discipline unable to set its own boundaries, while simultaneously medicine is characterised as a stable and established discipline that is able to face the challenges of belief medication. The consequences of the instability are presented as the establishment of phenomena such as therapeutic touch in two contexts, nursing practice and the academic world, presupposing that these areas are intertwined in the same way as the practice of medicine is intertwined with medicine as a scientific field. The expression 'even' indicates that the consequence of therapeutic touch becoming established in universities is regarded with reservations, generating an impression that universities are the last places where one would expect phenomena such as therapeutic touch to be found.

It is characteristic of this form of interdisciplinary boundary-work to parallel nursing and nursing science with medical practice and medicine, and to presume that nursing science as a discipline will reject as unscientific the same phenomena as medicine and that nursing scholars will use the same scientific criteria for research as medicine. The paralleling is active at occupational, educational and academic levels, which are not similar in the two fields: medicine and nursing science differ from each other greatly on these levels. The disciplinary differences between medicine and nursing science are not discussed in the medical journal article, but nursing scholars are expected to line up with medical scholars, despite the differences in the fields' educational paths, trade union activism and scientific criteria.

Nursing science in interdisciplinary boundary-work

Interdisciplinary boundary-work locates nursing science inside the system of disciplines as an applied discipline. It expresses apprehensions about the reputation of nursing science in relation to other disciplines. It points out potential disagreements with other disciplines, and compares the disciplinary authority of nursing science with that of other disciplines.

Interdisciplinary boundary-work depicts the relations between nursing science and other disciplines, mainly the larger and more

established field of medicine. It presents nursing science and medicine as equals, but also describes the subordination of nursing science to medicine. Nursing science is depicted as a scientific community member alongside medicine. Nursing science is characterised as a collaborative fellow discipline with medicine, alongside which it strives to improve the quality of health and health promotion. The high principles of healthcare are used to generate acceptance for the status of the discipline of nursing science and to promote its justification as a theoretical and methodological activity in the academic community that also deserves respect for the direct applicability of its research in practical healthcare settings. The bi-disciplinary collaboration between medicine and nursing science prepares the way for the acceptance of nursing science and its establishment as a scientific and theoretical domain that helps and improves the practical domain. Nursing science is paralleled with medicine in issues concerning its power over professionals in the field and the protection of the discipline against non-science. The presentation of these disciplines as equals is dominated by the notion of the common goals and ideals of the fields of medicine and nursing science in practical healthcare settings.

Nursing science is expected to follow the rules and boundaries of medicine and to deal with its own professional groups and their education with the same kind of authoritative and unanimous power as medicine, in spite of the differences in the two fields' professional power to influence professional journals and educational institutions, and in spite of the limitations of scientific education in nursing science. Thus nursing science is required to display the same characteristics as the more established and more internally coherent discipline of medicine, and medicine is used as the standard for evaluating and analysing nursing science.

Subordinate status characterises nursing science, which is expected to line up behind medicine's rules and criteria of good scientific conduct. The relationship between nursing science and medicine constructs the supremacy and domination of medicine over nursing science. Thus the relation of nursing science to other disciplines is dominated by criticism, and nursing science is demonstrated to be dependent on acceptance from other disciplines. Nursing science is depicted as subordinate to medicine, the criteria of which are taken to be the standards for nursing science as well. Nursing science is depicted as precarious, and its area can only hesitantly be demarcated. The relation of nursing science with other disciplines is presented as

giving rise to apprehensions about its reputation in the scientific community. The reputation of nursing science is constructed as vulnerable and dependent on other disciplines. The field of nursing science is depicted as having the potential to fail to apply scientific criteria. Nursing science is portrayed as a potential counterforce to medicine and a creator of different perceptions of science, the credibility of which, however, is questioned.

Interdisciplinary boundary-work deals with the linkages between nursing science and medicine and constructs the relationship with medicine as nursing science's most important and dominating relationship. Other disciplines are not mentioned explicitly, even though nursing science has many disciplines both inside itself and close by, in terms of professional orientation (social work, nutrition science, psychology), theoretically (social sciences, humanities) and thematically (health sciences other than medicine, such as public health and epidemiology). The sociologist of science Mathieu Albert and his research group (2008, 2529, 2009, 190), who have investigated medical researchers' perceptions of social scientists in health research, have argued that social scientists doing health research tend to be confined to a subordinate role. Interdisciplinary boundary-work that mentions only medicine as a reference point for nursing science may reflect the position of medicine in the health research field and the impossibility of bypassing medicine to refer to other, less powerful disciplines that are also subordinate to it. Interdisciplinary boundary-work focuses on the complexity of nursing science's relationship with medicine, and its relationship with other disciplines is neglected. Thus the forms of interdisciplinary boundary-work indicate support for the position of medicine and the reproduction of the subordinate role of the social sciences in the health research field. Emphasising the bi-disciplinary collaboration between nursing science and medicine excludes other disciplines in the scientific community that also strive to improve the healthcare of the population, and generates the impression that nursing science is deliberately partnering with medicine instead of other, less prestigious disciplines.

In interdisciplinary boundary-work the issue of multidisciplinary and the multidisciplinary approach is discussed surprisingly little. The reason for this might be that this discussion is not about the distribution of work between disciplines, nor is it a matter of competing interpretations of some issue (Klein 1996, 70). Rather, the expectation value of the discussion is that nursing science acts in a

similar vein as medicine and makes similar interpretations in drawing the boundaries of the discipline. Thus the case is more about medicine overruling nursing science, and the independence of nursing science appears to be limited by the limitations of medicine.

Boundary-work between science and society

This chapter presents my analysis of boundary-work between science and society in the conflict over therapeutic touch. The boundary-work between science and society was found to take six forms: arguing about the societal functions of the discipline, articulating popularity as a justification for research, presenting the goals of knowledge production, formulating academic-practitioner relationships, generating boundaries between professional domains, and discussing boundaries between institutional settings. These forms were found in the *Sceptic* interview, the ethical dilemma column, the university bulletin article, a series of newspaper opinion pieces, and the medical journal article.

The societal functions of nursing science

The first form of boundary-work between science and society argues about the societal functions of nursing science. This was found in the *Nursing Science* article and the ethical dilemma column. The *Nursing Science* article is by the professor of nursing science at the University of Tampere. It was published as a discussion article following the Humbug Award in the first of five numbers of the journal in 1997. The article summarises the author of the therapeutic-touch book's defence and repeats the reasons behind the scepticism movement's decision to give the award to the publisher Kirjayhtymä. It also briefly introduces the main points stated in the *Sceptic* interview. Then it discusses the publisher's response to the Humbug Award. In this part the article argues:

It is also interesting that research objectives are now being pressed in a New Age direction from outside the universities. Everything can be researched and everything can be studied, but a distinction must be made as to the level at which it is appropriate to study and research certain

things. First of all the question must ultimately relate meaningful research topics for nursing scientific research on nursing to the advancement of health, and to quality assurance in healthcare activities in patient care. (Paunonen, Marita 1997. Science versus pseudoscience as a basis for nursing and its teaching. *Hoitotiede [Nursing Science]* 9 (1/1997), 46–47)

The expression ‘from outside the universities’ emphasises the separateness of the publisher from university activities, and generates an impression that in an ‘outside the universities’ context the boundary between science and non-science cannot necessarily be drawn. Thus the academic community is given the main authority to define questions and topics for research.

The metaphorical verb translated above as ‘press’ has three meanings in Finnish: 1) to clench or squeeze, 2) to iron clothes or force clothes to fold with an iron and 3) to pressure or lobby someone to do something or to corner someone (Kielikone 2012). The use of the metaphor ‘press’ connotes pressure from outside that is pushing university researchers to do research on some subjects. The expression presupposes that the pressuring is forceful. Those being pressed are university researchers, the one doing the pressing is the publisher, and the direction in which the pressure is pushing is towards unscientific knowledge in the form of the ‘New Age’. The term ‘New Age’ refers to an ideology combining several religious and philosophical elements. This terminology will be further analysed in the last subchapter, but for now it is sufficient to say that the term ‘New Age’ here creates a boundary between pseudoscientific or unscientific knowledge and scientific knowledge. The repetition of the extreme expression ‘everything’ in relation to research and study is contrasted with ‘appropriate’. This contrast generates the impression that the limitations on study and research topics derive from their suitability or functionality for certain levels of study or research.

The last sentence of the excerpt defines the tasks of nursing science. The evaluative adjective ‘meaningful’ connotes an issue that makes sense, drawing a contrast with ‘New Age’ in the previous sentence as something senseless and absurd. The adjective ‘meaningful’ also generates an impression of the relevance to society of the issues mentioned, ‘the advancement of health’ and ‘quality assurance in healthcare’, and emphasises the importance of these issues to all members of society and healthcare organisations. This presents nursing science as beneficial for society, benefitting people’s health and the social organisation of caring tasks.

The ethical dilemma column also makes an argument about the societal functions of nursing science. The excerpt is taken from a part of the column where the professor emerita is answering the reader's question as to whether it is worthwhile for a nurse to study nursing science. The column argues:

After taking the degree a nurse can continue research work and gradually expand her know-how as a researcher, and can view the unjustifiable arguments offered to her in with criticism in the name of scientific knowledge. The opportunity also arises to direct nursing scientific research towards questions that are central to human welfare and practical nursing. (Kalkas, Hertta 1997. Ethical dilemma column 'What are the ethics of research and teaching in nursing science like?' Question by Perplexed Bystander. *Sairaanhoitaja* [Nurse] 70 (2), 32, 21.2.1997)

The excerpt uses the expression 'in the name of scientific knowledge', indicating that the graduate nurse is operating as a representative of science. Criticism and scientificity are depicted as connected with each other, and a formal degree qualification is seen as a mandate to work as a representative of science. The evaluative adjective 'unjustifiable' in connection with certain arguments contrasts with arguments that are justified. The adjective 'unjustifiable' in the sentence is contrasted with scientific knowledge, which thereby is depicted as explicable and justified. With these notions one of the reasons for a nurse to study nursing science is shown to be the formal qualification that enables the person to think critically and find rational arguments for phenomena in society. Thus abstract critical thinking skills become one of the societal functions of nursing science. The functions of nursing science are also presented in the last sentence of the excerpt: to produce human welfare and to develop practical nursing.

It is characteristic of this form of boundary-work between science and society to emphasise the benefits of nursing science for the health of people in society. There is a subtlety in the argumentation, in that the incumbent professor seems to stress the administrative side and the organisation of caring tasks in society, whereas the professor emerita seems to emphasise the development of actual work practices. With different wordings the professors also highlight the criticism and critical thinking skills that come with the discipline of nursing science. The media researcher Esa Väliverronen (2004, 373) argues that researchers in various scientific disciplines use manifold rhetorical tools to justify their work and generate high expectations for scientific

research to solve societal problems. The incumbent professor and the professor emerita present the discipline's abilities to solve the social problem of the organisation of healthcare and work practices. Nursing science is also depicted as a prevention mechanism to protect society from straying from the correct path of knowledge.

Popularity as a justification for research

The second form of boundary-work between science and society presents popularity as a justification for research. Two texts were found to use this form of boundary-work between science and society, the university bulletin article and the *Sceptic* publisher response. The university bulletin article interviews two nursing scholars, and one of them mentions popularity as a reason to do research. This nursing scholar was at the time of the conflict a researcher at the National Research and Development Centre for Welfare and Health (Stakes³³), a government research institute not directly connected with any university. Earlier, in 1993, she had been a lecturer at the University of Tampere, and in this role she had supervised the Masters thesis on therapeutic touch. At the beginning of the article the researcher evaluates the Masters thesis by saying that it was considered to amply fulfil the criteria for Masters theses. Towards the end of the article she states:

The official healthcare system has not cast much of an eye over these kinds of alternative treatment, and they have not even been taken as topics for research in a serious way. Anyway, we who come from nursing science do encounter people who use these treatments. Therefore I think that additional knowledge should be acquired about them by means of research. Thus it should be investigated why people use these treatments and what they get from them that official healthcare cannot offer, she says. (Ollikainen, Marketta 1996. Spiritual healing for nurses? *Yliopisto [University]* 20/96, 38–39)

The first sentence generates a dichotomy between the official healthcare system and alternative treatments. The dichotomy is repeated, which strengthens the contrast between official and unofficial care in the form of alternative treatments. The negation 'has

³³ Stakes as such no longer exists: in 2009 it was merged with the National Public Health Institute (KTL) to form the National Institute for Health and Welfare.

not cast much of an eye over' suggests an expectation that alternative treatments should be considered, but this expectation has not been met and they have not been looked into. The verb 'cast an eye over' is a metaphorical expression implying that these treatments would be looked at only briefly. It generates the impression that, as a minimum, these treatments should be acknowledged by conducting research on them and not ignored, as the verb 'cast an eye' indicates.

The quantification 'not much' suggests that there was an expectation that the treatments would be looked at but that this has not happened, which indicates the speaker's disappointment in the official healthcare system and research. The other negation in the first sentence, 'not even', indicates an expectation that alternative treatments would be researched, but the expectation has not been met and the treatments have not been taken as topics for research. The evaluative adjective 'serious' connotes deep and profound research conducted in order to really understand the phenomena in question. Research is expected to be serious, instead of a light and carefree approach that does not delve deeply into the phenomena.

The adverb 'anyway' indicates a possibility that research might be done on alternative treatments for the reason that nursing personnel meet people who use these treatments. Thus the popularity of alternative treatments is used as a motive for the conduct of research on these treatments. The 'we-rhetoric' in the second sentence generates the impression of a coherent group of nursing scholars. The expression 'who come from' indicates a division between 1) those who meet people who use alternative treatments and 2) those who do not meet people who use such treatments. The division also presupposes that there are some who come from nursing science and others who come from somewhere else. This generates the impression that the others referred to by the speaker are those who 'come from' medicine, who also act in the field of the official healthcare system alongside actors who 'come from' nursing or nursing science.

The modal verb 'should' in relation to the verb 'acquire' in the third sentence implies that the speaker expects these treatments to be researched because they are popular and because nurses meet people who use these treatments. The modal verb 'should' in the fourth sentence uses the same motive for research, the popularity of alternative treatments, and indicates that the speaker's understanding includes alternative treatments as topics for research alongside treatments used in official healthcare. The modal verbs indicate that

from the perspective of the speaker, the healthcare system lacks knowledge about alternative treatments, the reasons why people use them, and the help people receive from treatments that the official healthcare system does not offer. Thus the research is expected to be conducted from the perspective of human experience.

As a whole, the university bulletin article gives an impression that research is expected to be able to cross the boundary between official treatments and alternative treatments, a boundary familiar from medicine. Research is also expected to reach into the world of human experience, which generates a boundary between the traditions of research on the human body and research on human experience. Research is seen as relevant because it analyses the prevalence and use of alternative treatments in society. Thus the power of research is expected to be used to cross the previous boundaries between official care and alternative treatments, research on the body and research on the mind, nursing and medicine, and scientific and unscientific knowledge. The excerpt as a whole aims to broaden the scope of research to include alternative treatments that are popular in society.

The *Sceptic* publisher response also presents the popularity of alternative treatments as a reason for doing research. This response was written by the publisher Kirjayhtymä, which received the Humbug Award. The text was written in response to the award, which the publisher received in December 1996. According to *Sceptic*, the response was sent to the Finnish News Agency for dissemination after the Humbug Award. The response was published together with the *Sceptic* interview and the scepticism movement's reasons for making the award. The response starts by explaining the publisher's aim to publish textbooks for the fields of social care and healthcare. The publisher's main motivation is stated to be 'to ease the conditions of patients'. After these explanations, the publisher response argues:

According to research, over half the population utilises complementary treatments. Regardless of this, the publisher and the author of the book knew that *Therapeutic Touch* would arouse discussion anyway. Kirjayhtymä's view nevertheless is that forms of treatment that are used must be tested and analysed within the university too, so that knowledge and analysis will be acknowledged by the field to the benefit of patient care. The back cover of the book already says that 'therapeutic touch does not replace nursing or medicine but complements traditional care.' (Unknown author 1996. Publisher Kirjayhtymä answers: the patient is more important than the Association of Sceptics' peace of mind. *Skeptikko* [*Sceptic*] 4/96)

The expression ‘according to research’ generates the impression that the findings of research on alternative treatments have been repeated in several research projects. This creates an impression that there is no conflict between different research findings, and implies that the knowledge that over half the population uses alternative treatments is indisputable and complete. The expression ‘over half the population’ quantifies the use of alternative treatments in society and generates the impression that knowledge about alternative treatments in society is unambiguous and definite, even though exact numbers for the use of alternative treatments have been considered very difficult to measure.

The calculations about the field of alternative treatments in the article may relate to research that considers the field to be fragmented. Studies have found that the number of different treatments is difficult to measure (STM 2009, 13). Some studies have been conducted on the use these treatments, but the figures are 30–40 years old. Health sociologists who analysed the use of alternative treatments among the Finnish population argued that half of the population had used health products (products available in health stores), a little over 15% had used natural remedies, and one tenth had used Finnish folk medicine (massage, bone setting, cupping or other forms of healing) (Vaskilampi, Meriläinen and Sinkkonen 1992, 12³⁴). Some research has been conducted subsequently, but it has concentrated on certain patient groups or on the use of specific therapies. The publisher of *Therapeutic Touch* may have been using figures from the 1990s to support the argumentation on the popularity of alternative treatments.

The evaluative adjective ‘complementary’ makes the treatments more comprehensive, indicating that treatments outside alternative treatments are insufficient and imperfect. The evaluative adjective also indicates that the needs of patients are not fully met by the exclusive use of treatments other than alternative treatments. The excerpt thus categorises other treatments as insufficient for patient care, and alternative treatments as treatments that complete patient care. The contrasting connective ‘regardless of this’ reveals the expectation that, because complementary treatments are so popular, a broad discussion might not have risen, since so many people in society use and are familiar with the treatments. The term ‘anyway’ indicates that the expectation was not met, and instead discussion arose about the book. The reservation ‘nevertheless’ stresses the publisher’s and author’s

³⁴ For the attitudes of cancer patients on the use of CAM, see Salmenperä 2005.

foresight and presents the discussion initiated by the Humbug Award as understandable and expected. This shows an understanding of the discussion generated by the scepticism movement's Humbug Award, and justifies the publisher's action to publish on a topic that is considered unscientific.

The expression 'within the university too' presupposes that research on alternative treatments has already been conducted in institutions other than universities, and this is used as a reason for university research to extend to these treatments. This notion generates a distinction between university research and research from other directions, and suggests that university research is incomplete because it has not tested and analysed complementary treatments. The category of university research includes the notion that the knowledge discovered through it will be utilised for patient care, whereas research by other institutions is not necessarily utilised in patient care. The other institutions are not named.

The negation 'does not replace' suggests an assumption that therapeutic touch will be taking the place of nursing or medicine. The negation aims to refute this assumption. By presenting this assumption, which was already noted on the book cover and is now repeated in the response following the award, the publisher is preparing in advance for counterarguments and adjusting the argumentation to the supposed audience of university nursing and medical researchers. The verb 'complement' repeats the same effect as the evaluative adjective 'complementary' in the first sentence, indicating that the treatments used in nursing and medicine are insufficient, and that without complementary treatments the needs of the patient will not be met in full. Thus the *Sceptic* publisher response creates boundaries between university research and other research, and between medicine and nursing on the one hand and alternative treatments on the other.

The argumentation used by both the professor and the publisher resembles the cold fusion case analysed by Gieryn (1999, 231–232), in which two researchers tried to use means that differed from traditional practices to define the grounds on which research is conducted, the reasons for adopting something as a research topic, and the ways in which research results are presented to the public. The excerpt by the publisher generates the impression that scientific knowledge does not meet the problems of society in their entirety, thereby seeking to broaden the present scope of research. The power of a social actor –

the publisher – to define research topics for science and to specify the deficiencies of scientific research is used, regardless of the traditions of nursing and medical science in the selection of research ideas and topics. The publisher's views reflect the general aim of publishers to publish books on topics that will sell. The principles of science in the selection of research topics are not the same as the publisher's aim to earn money from publications. From the point of view of publishing activity, the power of scientific research is to validate treatments that are used by patients in society. The powerful position of science is respected, but nevertheless the reader is persuaded of the incompleteness of current university research and the need to broaden its scope.

It is characteristic of this form of boundary-work between science and society to articulate the popularity of an activity as a reason to do research on it, and to broaden the scope of research. The argumentation is similar to that in the conflict over fasting, in which the relevance of the research was presented in terms of popularity.

Goals of knowledge production

The third form of boundary-work between science and society discusses the goals of knowledge production in nursing science. This was found in the *Sceptic* interview, which is here analysed in two excerpts from the answer to the journalist's fourth question. The journalist claims that Rautajoki, the author of the therapeutic-touch book, appeals to two theorists who have been developing energy field theory, Rogers and Parse. Then comes the question: 'In reality, what status do these theoreticians have in nursing science teaching at the moment?' The professor answers:

Rogers and especially Parse, who are mentioned by Rautajoki, seem at the moment to attract representatives of healthcare from healthcare inspectors and managers to teachers in healthcare education institutions and representatives of nursing practice. This attraction appears to have increased during recent years. Rosemarie Rizzo Parse does not work in any American university, but she has her own company and a wide electronic mail network in Europe and the United States, which markets and conducts education in accordance with Parse's ideology, in Finland among other places, at the desire and invitation of representatives of healthcare. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug

does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

The excerpt uses the verb ‘attract’ and the noun ‘attraction’ when describing the use of Parse’s and Rogers’s theories in the healthcare field. These expressions give an impression of the use of the power of attraction or charm to persuade individuals to become supporters of these theories. The expressions using ‘attraction’ as the lead word imply that charm has been the motive for individuals’ acquainting themselves with the theory, and conversely presents an expectation that factual reasoning should have been used to evaluate the theory instead. Those who have become attracted are presented in a list of four groups: healthcare inspectors, managers, teachers and nurse practitioners. The list generates an impression of the multiplicity of the groups that have become attracted to the theories, and reveals that nursing science’s expected sphere of influence is wide. The qualities of nursing science are depicted as extending to a variety of different groups in healthcare: managers and practitioners work in healthcare institutions, inspectors work in the county administrative boards,³⁵ and teachers work in the various healthcare education institutions. The list highlights the role of these actors in disseminating unscientific knowledge.

At the beginning of the excerpt the professor refers to two nursing theorists, Rogers and Parse, and at the end she targets her critique towards one of them, Parse. The negation ‘does not work’ creates an expectation that a nursing theorist will work in a university. The expression ‘but’ indicates that the expectation of university affiliation has not been met, and instead the theorist is presented as running her own business. This argumentation questions Parse’s credibility as a nursing scholar. Describing the extent of the electronic mail network as ‘wide’ contrasts work in universities with work in a business, and gives the impression that the education is widely advertised through electronic mail.

The excerpt constructs the category of education conducted by a business, the operational area of which is close to the task of universities. As in universities, the main product of the business is theoretical knowledge. The business’s theoretical knowledge is labelled

³⁵ At the time of the episode, county administrative boards were organised by the nine counties of Finland. Nowadays the activities of the county administrative boards are organised by regional state administrative agencies operating directly under ministries.

'Parse's ideology', suggesting that the ideology is connected with a certain world view that carries with it a certain idealism. The world view of universities is not discussed, which gives the impression that universities are not ideologically oriented, but rather are free from ideological thinking. Education in a business is marketed and conducted from a different ideological background than the work of universities, which is disconnected from selling and advertising. Thus the excerpt creates a category of education done by businesses, and uses this category to belittle Parse's work and to distance university knowledge production from ideological and market-oriented knowledge production. Nursing science is produced as the opposite of marketed knowledge, and its orbit is limited to the scientific community.

The *Sceptic* interview continues with three sections describing Parse's thinking as an ideology that emphasises individuality and comprehensiveness, and explaining the attraction of Parse's thinking for practitioners. The interview also discusses the familiarity of Parse's thinking to healthcare personnel and the ease of application of the theory to practice. Then the interview returns to the goals of knowledge production:

It is also a fact that – in general, in getting any message across – that good marketing ensures that the message gets across. Summer universities, centres for supplementary education and adult education centres in healthcare education institutions receive requests from the field at every turn, especially requests to organise education based on Parse's thinking. Thus this education is easy to sell. Hospitals and healthcare centres also organise placement training according to the philosophy in question to some extent. The students come to the universities from practical nursing and teaching and administration. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

The argumentation in the first sentence of the excerpt is rhetorically factualising. With the expression 'it is also a fact that' the content is made to appear independent of the writer and the writer's own opinions are blotted out, presenting her as not bearing any responsibility for the statement. This type of factualising elides the role of the professor of nursing science and generates the impression that there is only one possible interpretation. The phrase marked out by the dash, 'in general, in getting any message across', utilises two extreme expressions, 'in general' and 'any', generalising the activities of

good marketing as aids to the communication of ideas and theories. The repetition of the expression 'getting across' generates the impression that Parse's thinking has been able to make an intellectual breakthrough by marketing the ideology effectively. Simultaneously, marketing is presented as an easy and non-intellectual way of conveying the message of a particular theory. Education in Parse's thinking is described as 'easy to sell', generating the impression that there is a causal relationship between marketing and selling. The causal relationship between marketing and selling also suggests that Parse's theory is connected with the pursuit of sales. The notion thus conveys an expectation that marketable knowledge ought to be differentiated from the altruistic quest for knowledge that characterises nursing science's activities in the university.

A similar type of argumentation about marketing is used in the nursing scholars' opinion piece. The writers, who all hold positions in nursing science, write: 'The gurus of the movement gain considerable amounts of money from their educational events.' The use of the expression 'guru', which is connected with religious leadership, evokes the connotation that a religion has been established around the theories, and thus conversely generates the idea that educators are usually connected not with religion but with the merits of the scientific community. The noun 'movement' also suggests an ideology rather than a theoretical framework familiar from research. The nursing scholars' opinion does not name any theorists, nor does it point out explicitly what the 'movement' is called. The nursing scholars' opinion utilises the evaluative adjective 'considerable', which suggests the converse expectation that the amount of money gained from educational events will be small. Education is thus expected to be connected with non-marketable goods, and the role of money in educational events is downplayed. The excerpt separates commercial from academic aims of knowledge dissemination.

In their book *The New Production of Knowledge*, the sociologists Gibbons, Limoges, Nowotny, Schwartzman, Scott and Trow (1994, 1–4) characterise traditional knowledge – which they call mode-1 knowledge – as knowledge that is generated within a disciplinary, primarily cognitive model of knowledge production. According to them, mode-1 knowledge is primarily produced for reasons of academic interest, and in formal research structures such as universities, research establishments and laboratories. By contrast they describe mode-2 knowledge as connected with broader

transdisciplinarity, involved in the wider social and economic context, emphasising the application of knowledge and conducted in new, non-traditional institutions. In the mode-2 knowledge production process, supply and demand play an increasingly important role, and this form usually includes commercial considerations. Furthermore, Gibbons et al. (1994, 3) argue that for many, mode 1 is identical with what is meant by science, whereas mode-2 knowledge producers are not seen as behaving according to the norms of the scientific method. Mode-1 knowledge producers are seen to have the power to determine what makes good science, what are the norms of scientific conduct and who should be allowed to practise it.

The argumentation in the *Sceptic* interview and the nursing scholars' opinion piece implies that nursing science is here understood as a mode-1, curiosity-driven academic endeavour, and is less connected with the mode-2 type of knowledge associated with commercial considerations. The differentiation between academic and commercial knowledge production highlights the power of nursing science as a scientific activity committed to academic norms. Nursing science is distanced from commercial activities that are not as academically ambitious, but rather are mercenary and greedy to earn money from theoretical knowledge products. The excerpt from the *Sceptic* interview takes the mode-1 position and separates commercial activities from disinterested knowledge production. It uses the power of the academic position to present academic endeavours as altruistic and free from commercialism. The interview also presents Parse as an example of unscientific activity that is competing on the same ground with academics in order to gain money and win supporters. The power of mode-1 knowledge production is assigned to nursing science in order to reject Parse and her supporters from the scientific community and to leave the 'movement' outside the academic community.

The *Sceptic* interview lists the actors who offer training in Parse's thinking. The list consists of five actors: summer universities, centres for supplementary education, adult education centres in healthcare education institutions, hospitals, and healthcare centres. The first two actors are connected with formal education institutions, since summer universities operate under the auspices of universities, the centres for supplementary education are organised as part of university or polytechnic education, and adult education centres are organised by healthcare education institutions. These notions may refer to courses organised by the Häme summer university, where Parse conducted a

course on her theory, and to courses organised by Lahti polytechnic, where the basics of Parse's theory were discussed. Moreover, the adult education centre of Tampere's healthcare education institution organised courses on the starting points of Parse's thinking.³⁶ The hospitals and healthcare centres are not educational institutions but healthcare institutions which organise in-service training for their employees. The *Sceptic* interview makes the assumption that education on Parse's thinking is also provided in this type of education, which generates the idea that education on Parse extends to many educational levels, even outside of formal education institutions.

The excerpt from the *Sceptic* interview with the list of the actors providing training on Parse demonstrates the broad field into which Parse's theories have successfully been extended. This acts as a means to illustrate that the Parse movement has entered nursing science's area of operation with commercial aims, and that it is therefore usurping nursing science's social capital by using the undesirable logic of commercial persuasion. The professor defends nursing science from the influence of commercial activities, which contaminate pure scientific aims. The excerpt implies that with the spread of Parse's theories the orbit of nursing science has been misused, forcing the professor to defend the field. The excerpt indicates an expectation that nursing science will also operate in the area of supplementary university education, institutions of healthcare education and healthcare institutions. The presentation of the growing list of Parse's influence indicates a kind of possessiveness about the area in which Parse's thinking is being disseminated, and implies that the professor being interviewed is taking a defensive position towards this theoretical trend. Thus the *Sceptic* interview appears to protect the orbit of nursing science from unscientific influences and to demonstrate the power and autonomy of nursing science as the sole holder of proper knowledge in its area of operation.

The 'field' refers to representatives of nursing practice, and practitioners are seen as wishing to receive education on Parse's thinking. The extreme expression 'at every turn' regularises the practitioners' desires to receive education on this thinking as repeated and continual. The notion of students coming to the universities establishes the backgrounds of nursing science students as being from

³⁶ For advertisements for these educational events, see the journal *Sairaanhoitaja* [Nurse] (6/96, 9/96, 1/97, 3/97 and 6/97). Parse gave a course at Häme summer university in May 1996, and another in October 1997.

three separate contexts: nursing practice, nursing education and nursing administration. The last sentence in the answer is connected with this notion:

The reader may understand the situation in which a scientific higher education institution is exposed to the so-called learning of some students when it is teaching the students about internationally high-quality nursing science and nursing science's applications to patient care. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

The positioning of 'the reader' as the subject of the sentence persuades us of the correctness of the conclusion and neutralises the position of the writer. The positioning also helps the reader to accept this understanding of the situation of nursing science, and it evokes sympathy in the reader. The use of the verb 'exposed to' and the notion 'so-called learning' convey that nursing science in universities has involuntarily been forced into a situation in which it encounters students who have been misled in other educational forums and who thus have to be retrained or converted to scientific thinking.

The verb 'exposed' reflects the university's difficulty in teaching the principles of science in the wake of the penetration of these unscientific types of knowledge into several educational levels through several different types of institutional affiliation. The role of university nursing science is depicted as that of a struggling purger of unscientific elements and thinking. The notion 'of some students' gives the impression that the problems do not arise with all students, yet the problem is sufficiently large to be mentioned in an interview, and as such it illustrates the penetration of Parse's thinking into the world of practitioners. The evaluative expression 'internationally high-quality nursing science' categorises nursing science as high-grade scientific thinking competent in international scientific discussion, and Parse's thinking as low-grade unscientific knowledge applicable only locally.

Another example of goals of knowledge production is given in the eighth answer in the *Sceptic* interview with the professor of nursing science. The interview question is provocative: 'We are within a hair's breadth of replacing normal care with this kind of floundering. Shouldn't the higher-education structure that produces healthcare

teachers who support this kind of treatment also be held responsible?’
The professor answers:

Kirjayhtymä’s reply to the Association of Sceptics’ Humbug Award also casts the teaching of universities in a strange light. It is outrageously irresponsible that someone from outside the university should stipulate nursing’s research areas and point out the necessity of research in the areas discussed by Rautajoki. It is truly necessary to intervene broadly now at the level of nursing education and the implementation of nursing practice in the field. The key positions here are the rectors of the educational institutions in the field, the head nurses in the care organisations and the representatives of the Finnish Nurses’ Association. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

The answer refers to another text, the publisher’s response to the Humbug Award in *Sceptic*. That response indicated that the publisher’s view was that existing care methods must be put to the test, and that they must also be researched in universities in order to gain valuable knowledge that would benefit the care of patients. The metaphorical expression ‘strange light’ in the first sentence gives the impression that the nursing science teaching in universities presented in the publisher’s reply is unusual and exceptional. The evaluative adjective ‘strange’ conveys the expectation that nursing science should be presented in a conventional and ordinary light. The excerpt indicates that instead the opposite has happened, and nursing science has been presented in an odd and unusual way.

The evaluative adjective ‘outrageously’ in the second sentence conveys that the publisher’s suggestions about research areas and their necessity should have been made responsibly and without undermining the autonomy of the discipline to determine research areas. The suggestion of research areas is presented as a violation of the scientific community’s right to self-government. The notion ‘from outside the university’ indicates a contrast with the publisher’s understanding of who should determine nursing science’s research areas and suggests that the opposite is expected to happen, i.e. that research areas will be defined from within the scientific community. The publisher is contrasted with the representatives of universities, and the possibility that research areas might be defined from outside the university context is made unthinkable.

The expression 'truly necessary' emphasises the intervention to change current nursing education and presents that change as essential. With the temporal expression 'now' the excerpt reveals a hope that in the future nursing education will be pitched at a higher level than previously. The evaluative adverb 'broadly' implies that in the current situation the level of education and the implementation of nursing are small-scale, and reveals an expectation that in the future the situation will be placed under control.

The notion of 'key positions' in the last sentence lists the actors who are responsible for developing the nursing field – 'rectors of the educational institutions in the field, the head nurses in the care organisations and the representatives of the Finnish Nurses' Association'. They are categorised as responsible for defining the level of nursing education and the implementation of nursing practice. The educational institutions in question are not specified; however, most likely this is a reference to healthcare education institutions and polytechnics which offer education in the nursing field. 'Head nurses' connote all types of nursing administration in different healthcare organisations. The Finnish Nurses' Association is a professional organisation for registered nurses. Thus the list covers the areas of nursing education, nursing administration and professional nursing work. Simultaneously the university is depicted as responsible for defining both the areas of research and the necessity of studying them. The healthcare book publisher is placed outside the processes of defining nursing research, education, administration and practice.

It is characteristic of this form of boundary-work between science and society to differentiate between academic and commercial knowledge production. The different actors in the nursing field are listed, and university research is given the authority to formulate the topics for research.

Academic-practitioner relationships

The fourth form of boundary-work between science and society formulates the relationship between academics and practitioners. This form was found in the *Sceptic* interview and a series of three opinion pieces in a regional newspaper. In this excerpt from the *Sceptic* interview the professor of nursing science is answering the journalist's first question: 'What is your opinion, Professor Paunonen, about the

publication of books like this as textbooks for professionals and students of healthcare?’ The professor states:

I myself have been astonished at how generally poor or even lacking the content evaluation of educational and professional healthcare literature is. I think that the oversight and critique of educational and professional literature belongs to a higher level of expertise than the authors of educational or professional books. As I understand it, nowadays content evaluation is done to a large extent by representatives from practical work with the aim of checking the intelligibility of the text. This has led to the fact that the content of educational and professional literature is evaluated by those at whom the book is targeted as a textbook! (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

The evaluative adjective ‘astonished’ indicates the expectation that good content evaluation of educational and professional healthcare literature is a generally accepted regulatory practice in nursing. The pronoun ‘myself’ emphasises that the professor is an authoritative representative of nursing science who is eligible to evaluate the practices of oversight and critique in the publication of nursing literature. The notion of ‘a higher level of expertise’ classifies the abilities of representatives of practical work. Nurses are portrayed as capable of checking the intelligibility of a textbook but not of checking and critiquing its content. Thus a hierarchical border is constructed between the university professor herself, who belongs to a higher level of expertise, and an ordinary practising nurse, who belongs to a lower level of expertise regarding the evaluation nursing of textbooks. This generates an impression that the practices of the evaluation of nursing literature are in flux. The professor’s statement gives the impression that there should be an attempt to change the practices of the evaluation of nursing literature so as to make those practices the concern of nursing scholars, rather than of nurses at a lower scholarly level who do not have the required capabilities for evaluation. Thus the situation is used to maintain and produce hierarchical power relations between nurses and nursing scholars.

A series of three opinion pieces in Tampere’s regional newspaper illustrates how the relationship between the discipline of nursing science and the domain of nursing practice is constructed. The first of the three opinion pieces was published about a week after the Humbug Award, the second a week after the first, and the third about

a week after the second. The opinion pieces are analysed in chronological order.

The series starts with an opinion piece by three nursing scholars: two university professors and one lecturer from the University of Tampere. The piece analyses the announcement of the Humbug Award for the book *Therapeutic Touch*, and humbug in general. The text utilises the expression ‘humbug ideology’ without naming any particular theory or the theoretical underpinnings of any particular ideology. In the piece, the practical sphere of nursing is referred to in terms of ‘one hospital that is developing into an institution of humbug ideology’ and ‘another hospital that is requiring its new employees in some clinics to pledge themselves to humbug ideology’. The end of the piece asks:

Who takes responsibility for teaching and implementing the nursing described above? Are the publishers, book editors or individual authors responsible, or does the responsibility rest on the shoulders of the practical adopters, that is those who are most likely the least equipped for critical thinking?

Let us hope that practitioners have more common sense than the spreaders of humbug ideology. (Paunonen, Marita, Åstedt-Kurki, Päivi and Nieminen Heli 1996. Humbug also flourishes in healthcare. *Aamulehti* [Morning News] 21.12.1996, 4)

The interrogative ‘who’ at the beginning of the excerpt indicates that the excerpt aims to find those responsible for the teaching and implementation of humbug ideology. ‘Described above’ refers to the books that were mentioned earlier in the article. The piece gave two other examples of books, without naming the books explicitly. However, the text summarised the books in such a manner, using quotations or detailed descriptions, that both the books and their editors would have been recognisable to anyone familiar with the publisher’s books at that time.³⁷ In this way the text points to one current and one former colleague of the nursing scholars themselves at the University of Tampere. The excerpt explicitly names Rautajoki, the nursing teacher who is the author of the therapeutic-touch book. Additionally, the excerpt implicitly refers to someone – called a

³⁷ The books mentioned are: 1) Munnukka and Kiikkala (eds) (1996) *Teoriaa käytännössä* [Theory in Practice], Kirjayhtymä, Helsinki; 2) Munnukka and Kiikkala (eds) (1995) *Ihmisen auttamisen lähtökobtia* [Starting Points for Helping Humans], Kirjayhtymä, Helsinki.

‘humbug instructor’ – who is described as having written an article in a book. The article is described in detail, which makes it easy to identify the persons in question. Thus in making a point about writers of humbug ideology, the nursing scholars’ text labels colleagues as participants in humbug ideology and its spread.

The second sentence includes a list of four possible actors who might be considered responsible for teaching and implementing humbug ideology. The publisher is explicitly identified as Kirjayhtymä, and the editor can be taken as the editor at this publishing company. The authors of the books in question can be identified as the teacher Anja Rautajoki, one colleague and one former colleague of the nursing scholars. The last sentence identifies yet another actor as a spreader of humbug ideology. The actor in this case is a hospital that is becoming ‘an institution of humbug ideology’ and that requires ‘employees in some clinics to pledge themselves to humbug ideology’.

Through the powerful categorisation ‘humbug ideology’, these parties are labelled as potential actors in the spread of unscientific and contaminated knowledge. The blame is personified in the publishing company and the authors, and is abstractly placed on many nameless nurse practitioners. Generally the blame is outsourced to lower-level actors than the holders of university positions, with the exception of the current and former colleagues who have spread humbug ideology in their books. The university department itself is not seen as a responsible party.

The opinion uses the metaphorical expression ‘rest on the shoulders’ to convey that an insurmountable burden has been placed on the nurse practitioners, as they seem to have been given responsibility for teaching and implementing humbug ideology. The expression ‘critical thinking’ used by the nursing scholars creates a category of persons who have great abilities in critical thinking and another of persons who have low abilities in critical thinking. The superlative expression ‘most likely the least’ generates a hierarchy in which some members of the community have high-level critical thinking skills and others have few critical thinking skills. Those who have the greatest skills in critical thinking are those who are able to produce the hierarchy and who have written the opinion piece. Thus in the context of nursing, the text generates the impression of a hierarchy in which the holders of university positions are at the top and nurse practitioners are lower down.

The expression ‘more common sense’ in the last sentence indicates that nurse practitioners were chosen from the list as the bearers of responsibility for teaching and implementing humbug ideology. The sentence contrasts the nurse practitioners with the spreaders of humbug ideology, and indicates that provided that they have common sense, nurse practitioners may be able to take responsibility and reject the humbug ideology being offered. The expression ‘more common sense’ implies that the spreaders of humbug ideology have less common sense than the practitioners, which indicates that the spreaders are an irresponsible party who do not have the common sense to stop spreading humbug ideology and who are thus unable to draw the boundary between science and non-science. As a contrast, the nurse practitioners may at least have the potential – if they have and use common sense – to filter unscientific knowledge from scientific knowledge.

The excerpt from the nursing scholars’ text defines the field of actors who break the boundary between science and non-science and spread unscientific knowledge in the nursing domain. The style of the excerpt is reticent, as if it is trying not to explicitly humiliate any individuals, and yet it gives enough information to identify certain persons. Nursing scholars’ relationship to practitioners seems to be instructional: practitioners are told to be cautious about spreaders of unscientific knowledge. The scholars themselves are depicted being able, thanks to their critical thinking skills, to understand that the practitioners are at risk of breaking the boundary between science and non-science. The nursing scholars’ hierarchical position is thus higher than that of the practitioners, and yet the lowest position in the hierarchy is occupied by the spreaders of unscientific knowledge, who have completely lost their common sense and do not see the boundary between science and non-science. The excerpt also reveals an internal boundary within nursing science itself between what is considered scientific and what is considered unscientific knowledge, and it implicitly blames identifiable persons for the violation of the boundary between science and non-science, thus revealing that there is some internal activity that is eroding the credibility of nursing science.

The series of opinion pieces continues with a piece by the author of the therapeutic-touch book, who at the time was a lecturer in nursing at a healthcare education institution. The text implicitly refers to the nursing scholars’ question, ‘does the responsibility rest on the shoulders of the practical adopters, that is those who are most likely

the least equipped for critical thinking?’ The author’s response does not use a direct quotation, but instead describes the formulation of the nursing scholars’ article in her own words: ‘The aforementioned persons [i.e. the nursing scholars] also ask at the end of their text who is responsible for the spread of the above-mentioned elements in nursing.’ Then the author answers:

I as the author, and not e.g. the healthcare education institution, bear full responsibility for my own book and the things I presented in it. I also believe, unlike Paunonen, Åstedt-Kurki and Nieminen, that practical nursing personnel are capable of independent critical thinking without ‘higher-level’ screening. (Rautajoki, Anja 1996. Therapeutic touch is no humbug. *Aamulehti* [*Morning News*], 28.12.1996, 4)

The excerpt first categorises the book’s author and uses the weight carried by that category to generate credibility for the argumentation. The negation ‘not e.g.’ implies an expectation that there are many possible parties to whom responsibility for the book could be given, and rejects the proposal that some other party should be given responsibility for a book that she wrote herself.

The extreme expression ‘full’ in relation to responsibility denotes that any responsibility of other parties is totally excluded. Thus the nursing scholars’ suggestion that practical nurses might bear responsibility for spreading the ideology is rejected. The possessive ‘my own’ strengthens the impression that responsibility for the book cannot be placed on anyone other than the author. The first sentence simultaneously appeals to the author’s copyright and proprietary rights over the knowledge presented in the book, and specifies those who can bear responsibility for the field of nursing. The nursing scholars’ suggestion would mean that responsibility for the knowledge in a book could be borne by its readers, but the excerpt rejects this and instead suggests that it is the author who controls the knowledge presented in the book.

The second sentence in the excerpt includes the contrasting expression ‘unlike’, implying that the nursing scholars in question believe that practical nursing personnel are not capable of critical thinking. The use of the nursing scholars’ names personifies the notion and targets the critique at them. The expression ‘unlike’ generates an impression of trust that nursing personnel are capable of critical thinking and emphasises the disagreement with the nursing

scholars' text, thereby emphasising the differences between the book author's opinion and the nursing scholars' opinion.

The adjective 'capable' in relation to practical nursing personnel contrasts with the portrayal of practical nurses' equipment for critical thinking as 'the least' in the nursing scholars' text, and generates the impression of a gap between the views of the nursing scholars and the book author. The inverted commas around the expression 'higher-level' indicate that the author means that the origin of the expression is some source other than herself, give the term ironic tone, and generate the impression that the nursing scholars suggest a hierarchical polarisation between higher-level critical screeners and lower-level uncritical nursing personnel. This creates the impression that the nursing scholars do not believe that nurses are capable of critical thinking. The evaluative adjective 'independent' in front of 'critical thinking' implies that the author believes in nursing personnel's abilities to think critically.

The excerpt presents nursing science as screening and guarding the practice of nursing in society. The excerpt also generates a gulf between nursing practice, represented by nursing practitioners, and theory, represented by the nursing scholars. The excerpt gives the impression that the author believes in nurse practitioners' abilities and is ironic about the hierarchy produced by the nursing scholars. This shows that the hierarchy is not supported, but instead that nurses are understood as equal to and capable of critical thinking. The excerpt thus constructs a bridge between practical nursing and theoretical nursing science.

The third opinion piece in the series is written by a nurse and student of nursing science at the University of Tampere who was actively teaching, learning and promoting Parse's theory in hospitals before the nursing science departmental committee's decision. The excerpt is taken from the end of the student's opinion piece. Immediately before the excerpt there is a direct quotation from the nursing scholars' text: 'does the responsibility rest on the shoulders of the practical adopters, that is those who are most likely the least equipped for critical thinking?' After the quotation, the nursing science student enquires as to the meaning of this phrase, and then seeks to answer his own question:

Must it be understood that according to the writers, any 'guru' whatsoever can go around telling nursing personnel any 'humbug'

whatsoever and the injudicious nursing personnel will implement it blindly? (Virtanen, Mika 1997. The views of nursing scholars provoke astonishment. *Aamulehti* [*Morning News*], 2.1.1997)

The first sentence in the excerpt includes the extreme expression 'any whatsoever', generating the impression that nursing personnel listen to an indefinite number of speakers who want to talk to them. The nursing scholars' opinion is exaggerated and made to seem ludicrous. The expression 'guru' is taken directly from the nursing scholars' opinion piece. The inverted commas indicate that the expression is being used with an ironic meaning. The expression also implies that the nursing scholars have given the impression that nursing personnel do not check the qualifications of those they listen to. The second use of the extreme expression 'any whatsoever' implies that the nurses listening to these speakers do not apply any boundaries to the content of the talk, and that they do not make any distinctions as to what they listen to and what they do not. The expression 'humbug' directly quotes the nursing scholars' opinion piece, and the inverted commas again indicate that the expression is being given an ironic meaning, suggesting that the term 'humbug' is used in a ridiculous way. The evaluative adjective 'injudicious' implies that nurses lack judgement about the theories or ideologies they will begin to implement in their work. The evaluative adverb 'blindly' conveys that the nurses incomprehendingly implement ideas in their work, and gives the impression that nurses as a group lack common sense. The student's opinion piece is interpreting the views of the nursing scholars and trying to make their message seem ridiculous.

The categorisation in the excerpt portrays practical nursing personnel as underqualified and inadequately informed to take responsibility for the field as a whole. Thus the excerpt gives the impression that the nursing scholars in their opinion piece are acting as critics of nursing practice who are able to judge the ideological atmosphere of nursing practitioners and to control their behaviour in the socially organised professional practice community. The excerpt portrays the nursing scholars' views as ridiculous, and conversely demonstrates that the student values nursing practitioners and their abilities to judge. This makes the student opinion a bridge builder between nursing science and nursing practice while simultaneously consciously establishing a distance between the two.

The higher-education researcher Tony Becher (1990b, 140), who has analysed academic-practitioner relationships in nursing in an interview study, argues that academic nursing scholars can almost be described as colonialists who disapprove of nursing practitioners and consider them to be underqualified and inadequately informed. He also notes the common experience of a distance between academic nurses and the rest of the profession. The argumentation in the series of opinion pieces demonstrates the precariousness of the academic-practitioner relationship in nursing science. It also demonstrates how the argumentation over separating scientific from unscientific knowledge may be interpreted as producing and maintaining hierarchical positions, thus deepening the chasm between theory and practice. On the other hand, the argumentation also reveals that nurses can make the interpretation that they are being consigned to lower positions, and thus a distance is established between nursing science and nursing practice. Thus the argumentation in the series of opinion pieces reveals a possible distance between nursing science and nursing practice.

It is characteristic of this form of boundary-work between science and society to discuss the relationship between practical nursing and nursing science. The power to distinguish unscientific from scientific knowledge is negotiated. Nursing scholars are portrayed as calling for common sense and claiming that nursing practitioners may not have the critical thinking skills to draw the boundary between science and non-science. The nursing scholars are portrayed in the opinion pieces by the student and the book author as colonialists who undervalue nurse practitioners. The nursing scholars are also depicted as trying to promote the idea that practitioners are incapable of judging between science and non-science. The texts thus emphasise that the nursing scholars are building a boundary between nursing science and nursing practice, and at the same time the book author and the student dissociate themselves from this boundary, presenting themselves as bridge builders. Furthermore, the defenders of nursing practitioners claim that practitioners have enough critical skill and discernment to perceive the boundary between science and non-science.

Boundaries between professional domains

The fifth form of boundary-work between science and society generates boundaries between professional domains. This form of boundary-work between science and society was found in the *Sceptic* interview in the answer by the professor of nursing science to the journalist's eighth question: 'What is going to happen to patient safety if this kind of treatment is introduced into official healthcare, even on a small scale? [...] Can't some of the blame be placed on the higher-education institution, as it produces healthcare teachers who push these kinds of treatment?' The professor answers:

In healthcare the medical doctor is responsible for overall patient customer care, and the nursing personnel implement the care prescribed by the doctor. This is our basic idea. Within this process the so-called nursing is done, which is realised by registered, auxiliary, child and mental-health nurses. Naturally everyone is responsible for their own actions in nursing too, even though in nursing we do not in general have a formal position of responsibility. It is difficult to imagine that such a position will be achieved in the future if we go in the direction described by Rautajoki. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

The 'we-rhetoric' used in the excerpt indicates that the views about the distribution of responsibility in the Finnish healthcare system are shared by a large group of unified healthcare personnel, including nurses and doctors, of which the author is a part. The excerpt thus speaks on behalf of the healthcare sector as a whole in describing the present situation. The third sentence includes the list 'registered, auxiliary, child and mental-health nurses', which makes visible the different types of nurse who act to 'realise' patient care or implement that care. This demonstrates the distribution of tasks in healthcare, according to which the medical doctor has the power to prescribe care and the various nursing personnel implement it.

The fourth sentence includes the evaluative adverb 'naturally', presenting the distribution of tasks as a consensually accepted fact and normalising responsibilities for healthcare as the personal responsibility of each employee for their own work. The extreme expression 'everyone' makes the distribution of responsibility visible as a system in which the medical doctor is responsible for the whole and each actor is responsible for their own part of the whole. This

generates the impression that the distribution of responsibility is a generally accepted practice that is not negotiated among the practitioners. The contrasting connective ‘even though’ partly breaks this impression and suggests that nursing might have a more official position of responsibility.

The negation ‘in nursing we do not have’ indicates an expectation that nursing will receive a more official position of responsibility, but that it has not yet achieved it. The evaluative adjective ‘difficult’ expresses the expectation that nursing’s sphere of responsibility will grow in the future. The conjunction ‘if’ suggests that nursing’s area of responsibility can only expand under certain conditions, which do not include the path proposed by Rautajoki. This notion produces two possible scenarios for the future of nursing:

- a) Nursing continues with this (or a worse) state of affairs regarding its responsibilities, and continues to implement the care prescribed by the medical doctor. The cause of this state of affairs would be that the unscientific path proposed by Rautajoki has been followed.
- b) Nursing’s sphere of responsibility expands, and nurses attain some kind of formal position of responsibility. This requires that the path proposed by Rautajoki and the therapeutic-touch book not be taken.

These scenarios generate the impression that nursing is seeking to achieve a scenario in which its responsibilities will grow in the future. Thus non-science is depicted as an obstacle to gaining a more socially powerful position and a broader sphere of responsibility.

The professor’s answer in the *Sceptic* interview goes on to present the example of nursing-led units. According to the professor, the implementation of nursing-led units would mean that care units would be led and accounted for by nurses, and medical doctors would act as expert consultants.³⁸ The professor mentions that she has visited this kind of unit in Great Britain. Then the answer continues:

It is clear that responsibility cannot be given to nurses when there are suspicions over credibility. In this way again the opportunities to develop at least some sectors of nursing’s area of responsibility have been eroded, even though it should have been possible in Finland today, thanks

³⁸ Griffiths, Edwards, Forbes and Harris (2005, 108) provide a good definition of nursing-led units: ‘Nursing-led unit is an institutional setting where nurses assume the care management function (including admission and discharge decisions) and team leadership that is usually vested to doctors for the majority of patients.’

precisely to university education. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikeko* [*Sceptic*] 4/96, 12–15)

The impersonal expression ‘it is clear’ distances the professor from the argument and presents the denial of more responsibility to nurses on the basis of suspicions over their credibility as a situation that is generally known and not simply the professor’s own opinion. The negation ‘cannot be given’ indicates that it was expected that nurses would be given more responsibility, but this has not happened because of the lack of credibility. The noun ‘suspicions’ implies an expectation that the activities of nurses should not be dubious, but rather should be dependable and trustworthy. This expectation has not been met, and nurses’ credibility has been weak and controversial. The expression ‘again’ in the last sentence gives the impression that the erosion of nurses’ credibility is repeated in different situations, and indicates the continuity of nursing’s subordinate position in healthcare. The metaphorical verb ‘erode’ connotes the gradual destruction of the credibility of nurses and the nursing field, and generates the impression of an active and continuous weakening of the position of the field itself. The opposite seems to have been expected, and ongoing support for the field is presented as a hope.

The extreme expression ‘at least some sectors’ minimises the possibility that developmental work might result in more responsibility for nurses, and indicates that for nursing to gain a more powerful social position would be nearly impossible. The contrasting connective ‘even though’ starts the subordinate clause by implying a potential opportunity, and simultaneously presents a reservation by indicating that the opportunity has gone to waste. The opportunity is shown to have been provided by university education, but the expectation that the field would benefit from the opportunity has not been met, and instead the opportunity has been eroded because an unscientific direction has been followed.

The excerpt depicts nursing science as providing an opportunity to change the social and institutionally robust distribution of responsibilities for healthcare in Finland. The scientific discipline is presented as a potential change agent in the persistent power structures of society. On the other hand, the excerpt reveals the precarious position of nursing in relation to the credibility of its workers, the nurses in various positions at healthcare institutions. The

argumentation also indicates conflicting interests in the discipline from the point of view of nursing scholars and nurse practitioners: nursing scholars seek to gain credibility in the scientific domain, and nurse practitioners strive for better power positions in healthcare. A failure of nursing science's credibility will thus be a defeat on two fronts if the boundaries between science and non-science are breached and its credibility is undermined in the eyes of others. The boundaries between professional domains remain the same as before, continuing and strengthening the traditional model of the subordination of nursing to medicine, which makes it difficult to gain credibility in the eyes of nurse practitioners.

The professor of science studies Aant Elzinga (1990, 172) has argued that nursing has applied several strategies in the process of developing its knowledge base. One strategy has been professionalisation, leaning on the scientification of nursing knowledge; another has been more akin to trade union activism, changing existing power relations in healthcare institutions. This tension has been seen to stem from imbalances in the recognition accorded to the professional groups of medical doctors and nurses. The former have long been recognised as a powerful profession that has a dominant position in hospital power structures. Since its development as an expanding welfare occupational group, the latter has sought to gain more attention and leverage in practical healthcare settings (Elzinga 1990, 151). Furthermore, Becher (1990b, 140) argues that nursing science has evoked both respect and doubt among nurses: it represents a possibility to theorise and get new ideas to develop practical work, but at the same time it is seen as too distant and as unable to grasp the practical domain.

The excerpts utilise a rhetoric close to trade union activism, of seizing power from medicine in order to gain professional power and leverage and simultaneously establish credibility among nurse practitioners by presenting the hope of larger areas of responsibility. Thus the excerpts try to respond to professional nurses' expectations that nursing science will win them more leverage and better positioning in the hospital hierarchy through the achievement of higher-status responsibility. The scientification strategy is seen as a means for change. The excerpts also indicate that the power for change may go unused, depending on the actions of nurses themselves. If the nurses act in such a way as to reduce their credibility, applying suspect treatments and disobeying the rules of

scientific knowledge, the scientification project will fail, and so will the aspiration to acquire social power through university positions. Thus the responsibility for change is placed on nurses themselves, and nursing science is seen as a potential provider of change.

It is characteristic of this form of boundary-work between science and society to demonstrate the boundaries between the professional domains of medical practitioners and various types of nurse. The discussion deals with the distribution of responsibilities in healthcare. The argumentation warns the nursing profession against violating the boundary between science and non-science, and presents such violations as a threat to the acquisition of positions of professional and scientific autonomy. It warns nurses of their fragile position alongside the powerful medical profession. It presents the power of university-level nursing science as the means by which to improve the status of the precarious nursing profession in healthcare settings.

Boundaries between institutional settings

The sixth form of boundary-work between science and society discusses the boundaries between institutional settings. This form was found in the medical journal article and the *Sceptic* interview. The journal article by the two medical specialists argues:

According to the head of the nursing science department at the University of Tampere, Professor Marita Paunonen, there are plenty of belief medication courses in institutions for higher education in healthcare. This is regardless of the fact that some authorities, e.g. Professor Paunonen herself, have taken a critical stand against treatments such as therapeutic touch [reference to the regional newspaper article 'Humbug also flourishes in healthcare' by Paunonen, Åstedt-Kurki and Nieminen]. (Saano, Veijo and Puustinen, Raimo 1997. Belief medication – the new direction for nursing? The example of therapeutic touch. *Suomen lääkärilehti [Finnish Medical Journal]* 18–19, 2306)

This excerpt utilises the name and title of the professor and quotes her on the prevalence of belief medication courses in institutions of professional healthcare education. The excerpt is most likely referring to the *Sceptic* interview. The same nursing science professor also states that courses on humbug theory exist in healthcare education institutions in the local newspaper opinion piece explicitly cited at the end of the excerpt.

The expression ‘regardless’ indicates that the authority of the professor and of nursing scholars in general ought to have an effect on courses in educational institutions in the area of nursing. The expectation has not been met, and the courses continue to be held in these institutions despite a negative public statement by nursing scholars. The last sentence of the excerpt includes a reference to the regional newspaper article ‘Humbug also flourishes in healthcare’ by Paunonen, Åstedt-Kurki and Nieminen, and constructs this specific article as an attempt to stop the courses on belief medication in healthcare education institutions. The excerpt demonstrates nursing scholars’ lack of success in guarding the boundaries of the discipline, and emphasises the failure of the nursing scholars to influence the professional education of nurses.

The excerpt does not take into account the different positions of medicine and nursing science in relation to their influence over lower-level education in those fields. Education for medical doctors is limited to five universities only, and therefore the education of medical doctors can be influenced by anyone who has any teaching position in any school of medicine at any university. By contrast, nursing education is scattered across disparate educational institutions, namely vocational institutions, universities of applied sciences, and universities. At the time of the episode, higher education in nursing (the education of registered nurses and midwives) was provided in 25 polytechnics or institutions at the same level, and in five universities (Perälä and Ponkala 1999, 23, 26). Because of the disparity between these educational paths, an individual teacher of nursing science at a university has very few formal opportunities to influence the education provided at lower-level educational institutions. Informally, nursing scholars can occasionally be politically or institutionally represented on the boards of lower-level institutions, but other than that they can only affect the vocational and professional education of nurses by educating teachers who will then go into lower-level institutions and will adapt their own educational backgrounds to the needs of a vocational institution or university of applied sciences. The requirement that nursing scholars should control this multi-institutional nursing education is based on the point of view of the single-institutional path of medical education, and assumes that nursing scholars are in a similar institutional setting.

The journalist’s seventh question in the *Sceptic* interview claims that the author of the therapeutic-touch book justifies therapeutic touch

through theories that bring the concept of energy into practical nursing and make the abstract ideas of nursing science concrete. The journalist asks: 'Is the teaching of nursing science then so theoretical that higher education students cannot see the possibilities of its application to practical nursing and for this reason seek knowledge from reiki and other such courses?' The professor answers:

In addition in the whole field of healthcare there is a noticeable confusion at the moment between education levels. We have institutions of healthcare education, universities of applied sciences in the field, and universities. At the moment not all levels can define their own status, for example, in international activities and doing science, and for example the organisation of scientific conferences. (Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko [Sceptic]* 4/96, 12–15)

The notion 'the whole field of healthcare' establishes the professor's authority to comment on all levels of nursing education. The expression 'confusion' connotes disorganisation and disorder, generating the impression of a field in which the whole is in flux. The list of three items, 'institutions of healthcare education, universities of applied sciences in the field, and universities', illustrates the three levels of education and creates the impression of a complex educational field with a multiphase educational path.

The impression of a complex healthcare education system may relate to the changes that were being implemented across the whole Finnish education system at the time of the conflict over therapeutic touch. In the mid-1990s Finnish vocational and professional education was reformed through the establishment of a new model of polytechnics and the simultaneous reorganisation of upper-secondary education in vocational schools and secondary schools. After the reform, higher education was comprised of education in polytechnics and universities (Lampinen 2000, 88–120). The excerpt refers to the early stages of the educational reform and emphasises the boundaries between the different educational institutions.

The phrase 'not all levels can' conveys with the extreme expression 'all' that there are levels that can define their status and tasks in the field of healthcare education, but there are also levels that cannot identify their own tasks. The interviewee, a professor of nursing science, represents the university level. From this university-level

perspective, polytechnics and healthcare education institutions are portrayed as those that cannot define their own status correctly. The negation ‘not all levels’ indicates an expectation that educational levels should understand their own spheres of action and their place in the educational complex, but the expectation has not been met. Instead there are levels that cannot identify their place in the context of the current, reformed educational system correctly. The author herself is presented as able to analyse the educational complex from a university-level perspective, and to allocate tasks between the different parties.

The second sentence presents two examples which strengthen the impression that certain levels are unable to understand their own roles in the educational community. The list of three areas of activity – the internationalisation of education, doing science, and organising scientific conferences – illustrates the difficulty of the distribution of tasks. However, the repetition of the expression ‘for example’ generates the impression that there are also other areas of activity in which the distribution of responsibility has been difficult. These areas are not mentioned due to lack of space or for some other reason, but the use of ‘for example’ indicates the multiplicity of the areas of activity in which the distribution of tasks is an issue. The excerpt categorises the role of universities as producers of knowledge and performers of scientific activity. The other institutions may have other roles, but these roles are not explicated. This presents the excerpt as starting from the perspective of the universities and strengthening their already established entitlement to new knowledge. The roles of polytechnics and healthcare education institutions in the education system are presented as problematic.

The answer continues:

As a member of the Academy of Finland’s Research Council for Health, I have got into a situation where, for example, a healthcare polytechnic is applying for funding from the Academy to organise a scientific conference. In the first place this is not a task for a polytechnic but a task for universities, and in the second place, closer scrutiny has revealed the proposed scientific collaborator to be a healthcare education institution. Healthcare education institutions and polytechnics in the field nowadays get plenty of money from the Ministry of Education, quite unlike universities, which are forced to raise their money themselves. Such international activity at college and polytechnic level is reasonable and appropriate in its place, but among other things this kind of activity has contributed to the import of various odd ‘therapies’ into Finland.

(Ollikainen, Marketta 1996. Humbug Award 1996: humbug does not belong in nursing science: interview with Professor Marita Paunonen. *Skeptikko* [*Sceptic*] 4/96, 12–15)

The excerpt first positions the author as a member of the Academy of Finland's Research Council,³⁹ which generates credibility for her as a highly prestigious and authoritative member of the scientific community. The excerpt gives an illustrative example in which the reader is made to understand the professor's position. The portrayal of the difficulty in the distribution of tasks depicts the research funding decision process at the Academy of Finland. The verb participle 'got' implies that the nursing science professor has been involuntarily forced into the situation in which a polytechnic is applying for funding from the Academy of Finland to organise a scientific conference.

The pair 'in the first place – in the second place' indicates two types of shortcoming in the distribution of tasks. The first item in the pair specifies the allocation of tasks between universities and polytechnics. The excerpt assumes that there is an established view that polytechnics will have responsibility for organising conferences. The negation 'this is not' rejects this view and limits the authority to organise conferences to universities. The contrasting connective 'but' furthers the rejection in the previous sentence and limits the task of organising conferences to universities only. The expression 'proposed scientific collaborator' in the second item in the pair 'in the first place – in the second place' produces the idea that having a healthcare institution as a scientific collaborator is ridiculous, and thus places these institutions outside of the category of scientific collaborators.

The last sentence of the excerpt presents a contrast between richness and the easy acquisition of money, which characterise polytechnics and healthcare education institutions, and poverty and the difficult acquisition of money, which characterise universities with respect to international activities. The excerpt thus separates the institutions according to the prestige connected to funding: the acquisition of funding by universities from the funding organisation for basic research is considered more credible because the funding is based on academic competition, while the funding of institutions and

³⁹ The Academy of Finland is Finland's main funding organisation for basic research, and a position as a member of its council is highly prestigious. As a member of the council this professor, together with other council members, prepared a report on the status of nursing science in Finland (SA 1997, 13).

polytechnics is belittled. The excerpt promotes the credibility of university nursing science and distinguishes it from the activities of polytechnics.

The extreme expression 'quite unlike' maximises the differences in the principles according to which money is distributed for international activities to lower-level educational institutions (healthcare education institutions and polytechnics) and universities. The evaluative expression 'plenty' generates an impression of the wealth of polytechnics and healthcare education institutions in relation to their opportunities to internationalise. The whole narrative generates an impression that the polytechnic was trying to usurp scientific university endeavour and to appropriate the resources intended for universities. This is presented as a boundary violation against the unwritten rules of the distribution of tasks between universities and other educational institutions. Thus the funding decision process is an example of the undesirable crossing of the boundaries between the tasks of universities, polytechnics and healthcare education institutions, and the professor takes action in order to guard the purity of university research and its right to prestigious basic-research funding.

The adjective 'reasonable' implies that it is expected that international activity will be conducted on an appropriate basis. The contrasting connective 'but' indicates that this expectation has not been realised, and instead that international activity has had some unreasonable aspects. The expression 'among other things' implies that there are many other unreasonable aspects to international activity that are widespread, or that there are many ways to import odd therapies into Finland. This notion regularises the import of strange therapies as a systematic and regular activity by polytechnics and healthcare education institutions. The evaluative adjective 'odd' implies an expectation that imported therapies should be well known and widely accepted, but instead the expectation has not been met and the therapies imported have been abnormal and peculiar. 'Therapies' is placed in inverted commas, which conveys that the word is being used with some meaning other than the ordinary. The inverted commas thus generate the impression that the therapies that have been imported alongside the international activities of the institutions in question do not belong to the usual therapies known to scholars in the area of healthcare. This indicates that the therapies are considered as not belonging to the scientific sphere.

The excerpt illustrates the differences between educational institutions at lower and higher levels. It implies a hierarchy of educational institutions in which lower-level institutions are suitable neither to organise conferences nor to conduct other international activities in the scientific community. The power to define the scientific community is retained within the community itself, and the power of nursing scholars (especially this professor) to hold onto power in their area is demonstrated. Through the differentiation between healthcare education institutions and polytechnics on the one hand and universities on the other, a boundary is generated between professional education and scientific education, and the power to define the boundary is limited to the scientific community of nursing scholars. The excerpt performs a social division of labour and allocates tasks between universities on the one hand as producers of scientific knowledge and hosts of scientific conferences and international scientific activities, and polytechnics and healthcare institutions on the other hand as institutions where international discussions differ from university activities.

The Finnish Higher Education Evaluation Council's evaluation of healthcare education (Perälä and Ponkala 1999, 59–60), which was launched a couple of years after the conflict over therapeutic touch, claims that the division of roles between the polytechnics and universities had not yet been firmly established. The evaluation argues that polytechnics had become like universities, even though this was not the purpose of the reform. Lampinen (2000, 118–119) also argues that for the polytechnics, the drift into academia – in which polytechnics imitate universities and attempt to blend into the university system – may become an important force. The *Sceptic* interview clarifies the functions of the two kinds of educational institution in the context of social reform, and draws on the authority of nursing science to hinder the polytechnics from starting to become like universities in their international activities and the organisation of conferences and to prevent them from imitating the functions of nursing science at university level. Thus the institutional boundaries between polytechnics and universities are marked.

The excerpts present universities as able to judge what the boundaries between the two types of institutions are, whereas polytechnics are depicted as lacking the ability to judge the boundaries. Moreover, universities are portrayed as critical of unscientific elements in society, and polytechnics and other healthcare education institutions

as lacking the ability to judge the boundary between science and non-science in the healthcare field. The last sentences analysed offer a warning that if the institutional boundaries are not maintained and observed, the possibility and danger will arise that the boundary between the scientific and the unscientific will be crossed. Thus the excerpts give science a monopoly on authority to define the boundary between science and non-science, and show how a hierarchically lower-level institution may break this boundary because it lacks the ability to distinguish between scientific and unscientific knowledge. As a representative of university authority, the professor assumes the power to classify as unscientific theories that have been found to be useful and popular in other institutions of education. In addition, through the outsourcing of humbug to lower levels, the responsibility for the boundary violation is placed outside the university, and the university context is cleansed of unscientific elements.

It is characteristic of this form of boundary-work between science and society to articulate the boundaries between institutional settings of nursing education. The differences between the educational levels are demonstrated, and in particular the differences between polytechnics and universities are discussed.

Nursing science in boundary-work between science and society

Boundary-work between science and society was found to consist of six forms in the conflict over therapeutic touch. This boundary-work discusses the functions of nursing science in society. It separates nursing science from commercial activities and presents it as free from commercial goals. Boundary-work between science and society produces science's relations with societal actors, such as practitioners, publishers and educators at different levels of education. It also draws the boundaries between science and various institutions.

The boundary-work between science and society depicts the societal functions of nursing science. This argumentation invokes the beneficiality of nursing science for society in responding to the needs of health and the organisation of healthcare. Nursing science is characterised as beneficial for society in the struggle against unscientific knowledge and unjustifiable arguments. Relevance is generated in the argumentation by stressing that nursing science

mediates health to society. Nursing science is also depicted as helping to improve the quality of healthcare, which benefits patients directly, as the service will improve. However, the deficiencies of nursing science and medicine in meeting all the patients' needs are also demonstrated.

Nursing science is viewed as having the power to correct the ways and development of thinking in society by weeding out unjustified arguments and unscientific knowledge from its territory. The discipline is seen to broaden the scope of care in order to complete the care of the population through knowledge about popular health treatments. The texts argue for the crossing of the present boundaries of science to also include unconventional treatments as part of patient care. Nursing science is also characterised as able to differentiate commercial goals from scientific knowledge production. Nursing science is seen as able to survive this commercial and unscientific attack, and the power of the scientific community is extended to several terrains of education and nursing practice. Nursing science is depicted as a scientific discipline that makes a strong effort to control commercial activities around its knowledge area within the social domain of nursing.

The argumentation divides responsibilities between actors and creates a discipline that has sole responsibility to delimit its own research area, whereas other actors share with it the responsibility for nursing education and nursing practice. Outside influences from social actors such as publishers are presented as a violation of disciplinary autonomy and self-control. Nursing science is shown to be trying to gain power from medicine in terms of existing professional power structures, and to maintain the power of the discipline within the hierarchy of multilevel nursing educational settings. The argumentation depicts nursing science as a discipline that is striving for autonomy over its area of research. The nursing science field is portrayed as an academic discipline that is forced to confront other actors' intentions to usurp its disciplinary autonomy.

The professor of science studies Aant Elzinga claims that the new applied social-science disciplines may be characterised by the confluence of various different, contradictory interests and stakes (Elzinga 1987, cited by Becher 1989, 141). The power to demarcate nursing scientific knowledge production is granted to the nursing scholarly community alone, and it exercises the authority to prevent other actors from taking its place by specifying that the tasks and

responsibilities of those actors differ from those of the scientific domain of nursing. The orbit of nursing knowledge is demarcated by specifying the groups and institutional actors that are subordinate to nursing's scientific knowledge production within the same 'pure science project' and the boundary between science and non-science as set by the scientific community. The actors come from a variety of contexts, ranging from nursing practice, education and administration to entrepreneurial actors.

The argumentation reveals nursing science's relationship with practitioners of nursing. It demonstrates a hierarchy between high-level nursing science and low-level nurse practitioners. The argumentation demonstrates the power of nursing science to remove unscientific thinking from its orbit and to change the world views of practitioners so that unscientific world views are replaced with the scientific thinking model. It demonstrates the power of nursing science to change the thinking and world views of its students. Sympathy and understanding are called for by a discipline that is struggling to teach the principles of the scientific community to students who have been contaminated by unscientific elements at lower levels of learning in work and nursing studies. Nursing science is characterised as able to change power relations in healthcare and the subordination of nurses to medical practice. Nursing science appears to be taking the role of initiator of change in the nursing field, which generates an impression of a broad orbit of nursing science, ranging from nursing practice to education and knowledge production. Nursing science's relationship with practitioners is also depicted as tense: the argumentation demonstrates the gap between theory and practice in the relationship of nursing academics with nurse practitioners.

Boundary-work between science and other knowledge systems

This subchapter presents the analysis of boundary-work between science and other knowledge systems. The boundary-work between science and other knowledge systems was found to take three forms: contrasting scientific and unscientific world views, evoking suspicion towards nursing science, and the incursion of unscientific knowledge

into nursing science. These forms were found in the medical journal article, the nursing scholars' opinion piece, the *Sceptic* editorial, the university bulletin article and the *Sceptic* justification article.

Contrasting scientific and unscientific world views

The first form of boundary-work between science and other knowledge systems rhetorically contrasts scientific with unscientific world views. This was found in the medical journal article and the nursing scholars' opinion piece. The first text contrasting scientific and unscientific world views is the introduction to the medical journal article by two medical specialists. At least one of the medical specialists had been an active member of the Finnish scepticism movement.⁴⁰ The article was published in the *Finnish Medical Journal* a few months after the Humbug Award. The article states:

Evidence-based medication based on medical-science research (evidence-based medicine) is the newest trend in official medication. The emphasis is placed on methods of diagnosis and care of which the usability has been reliably proven. This may lead to the abandonment of some generally used methods because of their poor efficiency. This is in spite of the fact that many doctors and patients are familiar with and even attached to these methods of diagnosis and care. (Saano, Veijo and Puustinen, Raimo 1997. Belief medication – the new direction for nursing? The example of therapeutic touch. *Suomen lääkärilehti [Finnish Medical Journal]* 18–19, 2306)

The phrase in parentheses, 'evidence-based medicine', is written in English in the original article, thereby emphasising the internationality of this trend in official medicine and presenting an image of Finnish medicine as belonging to a wider international community. The evaluative adjective 'official' connotes structures and traditions that regulate the discipline and contrast science with unofficial and unregulated terrains. The superlative 'newest' stresses the topicality of the trend of evidence-based medicine and generates an impression of medicine as a progressive and dynamic field in which it is crucial to keep up to date. It also implies that medicine is a socially organised discipline in which the discussion of trends is continuous. The

⁴⁰ See Selin, Ollikainen and Salmi 1997. Veijo Saano was chair of the scientific advisory board of the Finnish Association of Sceptics, see *Sceptic* 4/1996, 41.

evaluative adjective ‘reliably’ emphasises the credibility of medicine as a discipline in which trustworthy methods are used.

The modal verb ‘may lead’ expresses the possibility that a popular treatment might be either abandoned or accepted depending on the criteria, which presents those criteria as self-evident and primary. The expression ‘generally used’ connotes a popular and widespread method and emphasises that popularity in itself is not a criterion for scientifically based treatments; instead reliability and efficiency are the principles according to which treatments are evaluated. The contrasting connective ‘in spite of’ implies an expectation that popularly and generally used methods that people have been used to and become attached to can be relied on. The contrast effect stresses that habit and attachment are not suitable criteria for a profession based on scientific research, and emphasises the criteria for abandonment or approval in the scientific endeavour of medicine. The quantifying expression ‘many’ implies that a method used by a large group of people might be abandoned following a consensus decision by the scientific community, which in this way will have an influence on the broad medical practice community. This notion convinces the reader of the impressiveness of scientific research and its effectiveness in changing the actual practices of medical practitioners.

The excerpt from the medical journal article constructs the credibility of medicine as a scientific endeavour and its effectiveness in relation to the medical profession. Forstorp (2005, 57), who has studied narratives that reject pseudoscience, argues that such narratives often start with an introduction stating the truth and validity of scientific knowledge. The medical journal article starts with an exemplary attempt to convince and persuade the reader of the superiority of the medical discipline and medical scientific criteria for finding evidence of the effects of medication and treatments in patient care. The abandonment of false and unscientific treatments serves as proof of the power of the scientific method to verify and falsify phenomena. This reassuring introduction acts as a starting point for nullifying the methods of non-science, which are argued against in the next part of the article:

Belief medication is strongly present in the public domain and offers an alternative to official care. One of the core thoughts in belief medication is that the patient may decide on their treatment according to their own views – belief suffices for evidence. Anyone whatsoever, including those who are not healthcare professionals, can become a therapist, thanks

either to education or to alleged supernatural forces. No therapy that is used is abandoned, and all new candidates are welcomed as equally valuable. (Saano, Veijo and Puustinen, Raimo 1997. Belief medication – the new direction for nursing? The example of therapeutic touch. *Suomen lääkärilehti [Finnish Medical Journal]* 18–19, 2306)

The evaluative adjective ‘strongly present’ indicates the expectation that, with a weak scientific basis or an absence of scientific criteria, there might not necessarily be so much publicity around belief medication. The adjective connotes the popularity of belief medication and stresses that popularity is used as a criterion for the acceptance of belief medication as an alternative to official care. The adjective ‘official’ repeats the impression that medicine is the authorised and accepted form of treatment and contrasts this with the unregulated nature of belief medication. The expression ‘their own views’ indicates that in belief medication individual opinions and evaluations are used as criteria for selecting the best knowledge, and that personal accounts are used to decide what is true or false. The expression separated by a dash, ‘belief suffices for evidence’, contrasts with the expression ‘reliably proven’ in the previous excerpt and generates the impression that belief medication reduces the scientific criteria of efficacy and reliability to the beliefs and feelings of the individual.

The extreme expression ‘anyone whatsoever’ stresses the randomness of the background, education and legal status of belief medication therapists, which generates the impression that the whole of the belief medication field is uncontrolled. The addition ‘also’ presents an expectation that only professionals should be able to work in healthcare, but in the field of belief medication this does not apply; instead, anyone at all is able to do the work. This notion emphasises the protection that the law gives to healthcare professionals and indicates that this formalisation is a guarantee that their activities will be based on science. The evaluative adjective ‘alleged’ indicates an expectation that forces should have been proven by scientific fact, but this expectation is not met and the forces have been proven through verbal accounts only. The adjective ‘supernatural’ implies that the claims are without natural scientific explanatory power and exceed normal or natural boundaries.

The extreme expression ‘no’ in relation to therapy generates the impression that the field of belief medication is criterion-free. The negation ‘no therapy [...] is abandoned’ expects that therapies should be verified or falsified according to some criteria, but in belief

medication this evaluative negotiation is not practised and therapies are accepted uncritically. The extreme expression ‘all’ contrasts with the selective criteria of science-based practice and generates an impression of the uncritical inclusiveness of belief medication.

As a whole, the excerpt describes the characteristics of belief medication and indicates that its criteria for distinguishing between true and false therapies are loose or non-existent, which in Forstorp’s (2005, 59–60) view is an example of a description of the characteristics of the methodology of pseudoscience. The excerpt gives an impression of a haphazard method of verification and falsification, which contrasts with the previously described empirical method of verification in such a way as to rob belief medication of its explanatory power. The general popularity of belief medication is used as a starting point for the critique to nullify the individual experiences and views of the invisible general population. The excerpt constructs two separate categories, medicine and belief medication.

The medical journal article then argues:

The nursing science side of things has produced its own candidates for belief medication. Last year there was a publicly announced treatment which seems to bring supernatural powers and subjectivity into the methods of nurses while claiming, however, to be based on science. (Saano, Veijo and Puustinen, Raimo 1997. Belief medication – the new direction for nursing? The example of therapeutic touch. *Suomen lääkärilehti [Finnish Medical Journal]* 18–19, 2306)

The notion ‘the side’ presents the writers as being aware of the field of nursing science and competent to evaluate that field in spite of their own background as representatives of another field. The notion of ‘the side’ of nursing science also presents nursing science as a separate entity differentiated from medicine, the discipline of the writers. The notion thus gives the impression that the writers have credibility to evaluate a discipline that is close to their field, and presents the boundary between the disciplines of nursing science and medicine as easily crossed. With this notion the article assumes the power to define and take care of the nearby discipline of nursing science. This gives an impression of helping the newcomer discipline in its struggle to remove unscientific knowledge from science.

The metaphorical expression ‘candidates’ gives an impression of a competitive bidding process in nursing science in which there are certain offers that might be included in the scientific sphere, and in

this bidding process the role of nursing science is to reject and ignore the bids on the basis on scientific reasoning. The word 'however', expressing a reservation, indicates that supernatural powers and subjectivity, according to the writers' understanding, are not expected to be connected with science, but despite this expectation supernatural powers and subjectivity are used as characteristics of science. The excerpt as a whole draws the boundary between belief medication and medicine and connects nursing science with unscientific elements. It draws the boundary between the scientific and the unscientific by presenting the superiority of the scientific method and explicating the weaknesses of unscientific methods. The excerpt also depicts a difference between nursing science's method of boundary protection and that of medicine.

The second text contrasting the scientific with the unscientific world view is the nursing scholars' opinion piece. The writers – two professors and a lecturer – were all present when the nursing science departmental committee made its decision to ban books by the nursing theorist Parse. The opinion piece was published in Tampere's main regional newspaper, which is read widely by the general public, about a week after the Humbug Award and a few days after the departmental committee's decision. The text starts by referring to another opinion piece in the same newspaper dating from about a week earlier, which dealt with humbug education courses in publicly funded education organisations,⁴¹ and to the Humbug Award that had been given to the therapeutic-touch book a week before, both of which used the term 'humbug'. The text brings to the fore another book published by Kirjayhtymä and relates this to the therapeutic-touch book, which was the original reason given by the scepticism movement for its Humbug Award to that publisher. The text argues:

The humbug publishing activity of Kirjayhtymä is not by any means limited to this single book. Another Kirjayhtymä publication, which according to the back cover is intended for readers who want to acquaint themselves with the ongoing currents in nursing science that are furthering its development and research activity, presents, among other things, the following ideas regarding development: (Paunonen, Marita, Åstedt-Kurki, Päivi and Nieminen Heli 1996. Humbug also flourishes in healthcare. *Aamulehti* [Morning News] 21.12.1996, 4)

⁴¹ This opinion piece was published in *Aamulehti* on 12 December 1996 by Erkki Hartikainen, and was entitled 'One cannot restrain the public support for humbug.'

The term 'humbug publishing activity' generalises that the publishing company is actively publishing books that contain nonsense argumentation and passages that mislead the reader with unscientific elements. The negation 'is not limited to' indicates an expectation that the book on therapeutic touch should be an exception from a generally reliable line of publication, but the expectation is not met and books such as that on therapeutic touch are presented as being continuously issued by this publisher. The negation thus generalises and labels the publisher as an actor who spreads humbug instead of reliable and useful books. The negation 'is not limited to' is complemented with the addition 'by any means', strengthening the impression that the production of humbug-type publications is the publisher's company policy. The adjective 'single' in relation to the book indicates an expectation that the book on therapeutic touch should be the only representative of the publisher's humbug publication policy, but this expectation is not met and the book is just one example from an abundance of humbug publications from this source.

The excerpt then introduces another book by indirectly quoting its back cover. The quotation can be traced to the book *Theory in Practice* published the same year as the therapeutic touch book, 1996, and by the same publisher, Kirjayhtymä; it was edited by a colleague and former colleague of the writers of the opinion piece. This book is a collection of articles that analyse the application of nursing science to nursing practice. By quoting the back cover of the book, the professors and the lecturer identify their colleague and former colleague as connected with humbug publications, and in doing so label them as spreaders of unscientific knowledge.

With the expression 'according to' the excerpt refers to the back cover, and the writers dissociate themselves from the presentation of the argument that follows and avoid taking responsibility for explaining it. The repetition of the word 'development' binds the argumentation of the writers with the argumentation on the back cover. In light of the connection being made between the editors and the book *Theory in Practice* on the one hand and humbug on the other, the repetition has an ironic flavour, emphasising that the writers themselves do not believe in what is being argued about development. The argumentation emphasises the difference between humbug books and research that is free from humbug.

The notion of the back cover about familiarising oneself with ‘ongoing currents in nursing science’ identifies *Theory in Practice* with the nursing science genre and the scientific genre, even though the book was published in the Hygieia series, which is targeted at public health nurses and registered nurses. Thus the book might also be classified in the textbook genre, and yet the mention of the nursing science background classifies the book as a text that seeks to fulfil the principles of scientific writing.

The text then presents three quotations from *Theory in Practice*, which I will analyse one by one. All three quotations are taken from one article in *Theory in Practice*. The article is entitled ‘Parse’s theory, caring theory and Husted’s model of ethical decision-making in nursing practice’. The nursing scholars’ opinion piece presents the quotations anonymously, without applying direct referencing practices. Yet the books, texts and persons in question are identifiable from the opinion piece. The opinion piece gives the impression that it does not wish to identify the editors or the author of the article, and yet it indirectly points to specific persons in order to arouse scepticism towards the work of these persons specifically. Thus the choice of anonymity has been made ambivalently, and it indirectly targets the criticism towards certain persons, without, however, directly excluding anyone in the scientific community. The persons get labelled as connected with unscientific humbug in an unfavourable manner. As the persons referred to anonymously are well-known nursing scholars, the boundary between science and non-science in the opinion piece appears to be personified and connected with the internal boundaries of the discipline of nursing science.

I understand the quotations as demonstrations that for some reason are of interest to the scientific readers, who are nursing scholars defending nursing science against humbug from the point of view of the distinction between the scientific and the unscientific. The first quotation is:

‘In nursing the human is seen as an open being in mutual process with the environment, generating forms of being in relation with others as creating and distributing matter and energy.’ (Paunonen, Marita, Åstedt-Kurki, Päivi and Nieminen Heli 1996. Humbug also flourishes in healthcare. *Aamulehti* [Morning News] 21.12.1996, 4)

The quotation is from page 171 of *Theory in Practice*. The article at this point describes Parse’s theory – the theorist whose works were

banned by the nursing science departmental committee – and its application to nursing. After the quotation the article refers to books by Parse,⁴² but these texts are not presented in the opinion piece. This serves to obscure the background of the ideology, and yet makes it visible to readers familiar with nursing literature. This diminishes the transparency of the argumentation to the newspaper's general readership and yet makes it visible for the broad community of nursing practice and the academic discipline of nursing. The quotation uses the expression 'open being', suggesting that the article relies on concepts that cannot be proved as true or false but instead relies on anecdotal oddities with no meaning in reality. The expression 'in mutual process with the environment' indicates that the article is based on concepts that cannot be linked with other concepts and that allow multiple meanings to be used.

The concept 'forms of being' evokes meanings related to existential questions, feelings or sense perceptions; in the context of the demonstration of humbug, this indicates that the exact meanings of the concept cannot be fully grasped. This labels the whole article as incomprehensible. The use of the words 'matter' and 'energy' also demonstrates a loose use of concepts familiar from physics and energy therapies, without defining the exact sense in which the words are used. The last clause is grammatically difficult to follow, which generates an impression of poor knowledge of the grammatical rules of a scientific text. Thus the quotation in the context of the demonstration of humbug shows that the article does not apply the rule of rigour; instead the concepts used in the article can be used in many ways, and the precise meaning of the words cannot be followed. This categorises the text as not belonging to the scientific genre and as violating the scientific practices of the rigorous use of vocabulary and correct grammar.

The second quotation is:

'The nurse does not try to neutralise the unsound rhythms of the other, but advises the patient to produce her rhythm herself and the nurse (??) on the other hand being present and in the rhythm.' (Paunonen, Marita, Åstedt-Kurki, Päivi and Nieminen Heli 1996. Humbug also flourishes in healthcare. *Aamulehti* [*Morning News*] 21.12.1996, 4)

⁴² The works referred to are 1) Parse R. 1981. *Man-Living-Health: a Theory of Nursing*, John Wiley & Sons, New York and 2) Parse R. 1993. 'Parse's human becoming theory: its research and practice implications', in Parker E. *Patterns of Nursing Theories in Practice*, National League for Nursing Press, New York.

This second quotation is taken from page 172 of *Theory in Practice*. The article at this point is describing the principles of nursing according to Parse under the subtitle ‘Simultaneous rhythms’. The term ‘rhythm’ demonstrates that the article applies the idea of rhythm, which is familiar from belief medicine, and which stands in this context as sign that the article is connected to mythical beliefs and unscientific knowledge. The question marks in parentheses after the word ‘nurse’ have been added by the authors of the opinion piece, and they imply that the previous sentence or word is being questioned by the writers. This generates the impression that the article is incomprehensible to the nursing scholars, and powerfully excludes other interpretations of the text. Thus the article is portrayed as an unscientific and incomprehensible text that cannot be evaluated according to any standards and which does not belong to the scientific genre as it is understood by the nursing scholars. The notion ‘being present’ indicates that the method is centred on the patient and nurse as individuals, and this contrasts with the perception that scientific knowledge is independent of the individual, constructing the boundary between scientific and unscientific knowledge.

The third quotation is taken from page 172 of *Theory in Practice* and includes a comment from the writers of the opinion piece:

‘Nor does the nurse believe in causal interventions whose purpose is to change the reality of the person.’

Does the latter mean, for example, that the nurse does not believe that medication (a causal intervention) can for example save the life of the patient, because it changes the reality of the person in the sense that the dying person is saved? (Paunonen, Marita, Åstedt-Kurki, Päivi and Nieminen Heli 1996. Humbug also flourishes in healthcare. *Aamulehti* [Morning News] 21.12.1996, 4)

The negation in the quotation, ‘does not believe’, generates for the scientific reader an impression that the text is in contrast with the core principles based on causal laws and the law of averages, which are central in the natural sciences. The highlighting of causal laws in the excerpt suggests that it is considered unusual in a nursing scientific text to contradict medicine, and that nursing in the eyes of the scientific reader cannot supersede the rules of the closely related discipline of medicine, either in professional or in scientific domains.

This indicates a disciplinary hierarchy and the subordination of nursing knowledge to medical knowledge.

The expression ‘for example’ in the comment by the writers of the opinion piece creates an impression that there are several possible interpretations of this sentence in *Theory in Practice*, but for reasons of lack of space not all of these possibilities are taken up. The expression ‘for example’ thus generalises the incomprehensibility of the text and suggests that it belongs to a less rigorous genre than scientific texts. The negation ‘does not believe’ implies that it is to be expected that a nurse will believe in the causal interventions of medicine. The negation indicates that in *Theory in Practice* this expectation has not been fulfilled and instead the nurse is expected to abandon medical principles because the reality of the person would be changed. The notion of ‘reality’ is used with an obscure meaning and thus blurs the boundary between the true and the untrue, indicating that the text contains elements that do not belong to the scientific genre. Thus the third quotation and the writers’ comment on it generate the impression that *Theory in Practice* is more connected with the genre of unscientific humbug texts than with scientific writing, and constructs the boundary between the scientific and the unscientific.

The excerpt after these quotations provides another example of the combination of quotation with direct commentary in the nursing scholars’ opinion piece:

Also, in the book the nurse’s legal and ethical responsibility is denied completely by noting without any further comment that ‘the patient is seen as an active participant in her own care, who has made her choice when agreeing to the operation and bears responsibility for her choices.’⁴³ (Paunonen, Marita, Åstedt-Kurki, Päivi and Nieminen Heli 1996. Humbug also flourishes in healthcare. *Aamulehti [Morning News]* 21.12.1996, 4)

The commentary by the nursing scholars starts with the addition ‘also’, which generalises the violations as common and easily found in the book. This generates the impression that the book belongs to a non-

⁴³ In its original context it is clear that this text is based on Parse’s theory, but this is not mentioned in the opinion piece. The sentence before the quotation and the quotation are as follows: ‘Siirryttäessä teknisestä perioperatiivisen hoitotyön toiminnasta potilaan kokemusta ymmärtävään hoitotyöhön voidaan perioperatiiviseen hoitoajatteluun saada lisäsisältöä omaksumalla Parsen (1981 and 1987) teorian läbestymistapa. Sen mukaisesti potilas nähdään aktiivisena omaan hoitoonsa osallistujana, joka on itse tehnyt valintansa suostuessaan leikkaukseen ja kantaa vastuun päätöksistään.’

scientific genre. The extreme expression ‘completely’ conveys that the nurse’s ethical and legal responsibility is totally and unquestionably denied in the book, and this is presented as a violation of the professional rule that the nurse should bear responsibility for her actions. The extreme expression ‘without any further comment’ indicates an expectation that the text should have commented on this breaking of the rule of nursing practice that the nurse should bear responsibility for her actions in care situations. The extreme expression implies that the expectation has not been met, and instead the role of the nurse is presented as completely free of responsibility. In the context of the nursing scholars’ opinion piece, which aims to demonstrate humbug, this generates the impression that to break this professional rule is also to break scientific rules.

The direct quotation is from page 49 of *Theory in Practice*, from the article ‘Family awareness in perioperative nursing’. The opinion piece focuses its attention on the evaluative adjective ‘active’, which implies that since the patient is active, the nurse must be inactive or passive. Attention is also given to the expression ‘bears responsibility’, which is interpreted as meaning that the patient bears the responsibility completely and that the nurse does not bear any responsibility. Thus the quotation is interpreted as containing a violation of the distribution of responsibility between nurse and patient, which is used to demonstrate the unscientific nature of the quotation. The boundary between science and non-science is thus drawn by portraying the violation of nursing ethics as a transgression of the genre of scientific writing and proof of the unscientific nature of the knowledge produced in the book.

As a whole, the quotations used in the nursing scholars’ opinion piece construct the boundary between science and non-science as identifiable from the genre of the texts in question. The opinion piece produces an image of the texts as belonging to the genre of unscientific knowledge production, which is differentiated from the scientific genre by presenting the quotations as demonstrations of the unscientific. The quotations serve to demonstrate a humbug type of language use, and as examples of deviations from the scientific genre. Regardless of whether the question is about poor forms of expression, the poor translation of references or a conscious misleading of the readers, the quotations are presented as conscious attempts to infiltrate the scientific arena with humbug. The quotations signify the incorrect use of vocabulary and a genre typical of humbug, and thus

they are distinguished from accurate scientific vocabulary and grammar. In the opinion piece the boundary between science and non-science is thus generated through the textual superiority of scientific argumentation and the inferiority of other kinds of argumentation. The expectations of the scientific genre are used to make the texts appear null and ridiculous, and thus they are made to look like nonsense. From the perspective of the rhetoric of science the quotations thus appear not to convey any meaning, which generates the impression that it should be expected that a text that typifies the discursive traditions of scientific knowledge will present knowledge that has been tested against reality (Pietikäinen and Mäntynen 2010, 81).

The opinion piece also wields implicit power by personifying the quotations, books and editors so as to covertly identify them as belonging to an unscientific school of thought. The opinion piece appears to be taking the quotations from certain books in a neutral way, but the analysis above shows that the piece is not free of personification, and that it consciously points to certain theories and scholars. The analysis indicates that the boundary between unscientific and scientific knowledge in nursing science is drawn not only by pointing out unscientific textual practices, but also through the internal use of power to censure colleagues, and to show that not all material that goes by the name of nursing science is free from unscientific elements.

It is characteristic of this form of boundary-work between science and other knowledge systems to contrast the scientific with the unscientific. The medical journal article and the nursing scholars' opinion piece depict the scientific as an ideal type of rationality requiring objectively and empirically evidenced knowledge explained by causal laws. Nursing science is seen to be in line with the empiricism of medicine, with the special requirement that practical settings be involved in research. The unscientific, by contrast, is characterised by subjective beliefs and a lack of empirical evidence from practice, resulting in a text genre or genres that are unsuitable for scientific textual forums. The power of the boundary between the scientific and the unscientific is also used to reveal the unscientific movement within the nursing science community, and to personify the extension of scientific boundaries to the unscientific in certain theories and scholars, which emphasises the purity of the writers

themselves and associates them with scientific knowledge that is pure of unscientific elements.

Evoking suspicion towards nursing science

The second form of boundary-work between science and other knowledge systems was discovered to consist in evoking suspicion towards the discipline of nursing science. This was found in the medical journal article, the *Sceptic* editorial and the university bulletin article. The first text evoking suspicion is taken from the medical journal article. Under the subtitle 'Basis in nurse and nursing science', the article explicates the boundary between belief medication and medicine:

Therapeutic touch does not appeal to its potential user, in this case the nurse, with modern technology, effective products or highly specific physiological or biochemical effects. According to the handbook, the essential components of therapeutic touch are empathy and a desire to help. (Saano, Veijo and Puustinen, Raimo 1997. Belief medication – the new direction for nursing? The example of therapeutic touch. *Suomen lääkäreilehti [Finnish Medical Journal]* 18–19, 2306)

The negation 'does not appeal' indicates that it is expected that a treatment will use scientific reasoning to persuade its users. The negation also implies that the book has violated the rules of scientific research. This categorises medical scientific reasoning as including modern technology, effective products and highly specific effects, and belief medication argumentation as comprising the psychological characteristics of empathy and a desire to help. The categories indicate that the authors expected the essential elements of therapeutic touch to belong to the first category, but their expectation was not met and the category of belief medication was connected with the treatment instead. This categorisation distinguishes belief medication from medicine.

In the next sentences the category of belief medication is specified:

A person engaged in therapeutic touch is required to have, among other things, sensitivity towards themselves and others, judgement, the ability to feel and become aware without being overwhelmed, awareness of the boundaries of their field, altruism, love, a strong desire to help and an understanding of why they want to help, plus enthusiasm, intentionality,

skills in the TT technique and relatively good health. Therapeutic touch is connected with humanity, caring, mental development and even wisdom. (Saano, Veijo and Puustinen, Raimo 1997. Belief medication – the new direction for nursing? The example of therapeutic touch. *Suomen lääkärilehti [Finnish Medical Journal]* 18–19, 2306)

The excerpt produces a list of qualities of the therapeutic touch practitioner. The abbreviation ‘among other things’ indicates that the list is even longer, but that for reasons of lack of space only some of the items have been listed. The list includes items that connect therapeutic touch with emotions, such as ‘altruism’, ‘love’ and ‘enthusiasm’, thus presenting therapeutic touch as a method that cannot be tested against reality and that contains values that cannot be measured by objective observation. With the expressions ‘a strong desire to help’, ‘an understanding of why they want to help’, ‘enthusiasm’ and ‘intentionality’, the excerpt also connects therapeutic touch with the practitioner’s eagerness to help and care, and generates the impression that the treatment is centred on the individual practitioner of therapeutic touch. These emotions exemplify a violation of the rule in natural sciences that all knowledge should be exposed to a test that is independent of the individual, and they therefore generate the impression that therapeutic touch is an unscientific treatment.

Forstorp (2004, 53) argues that the rules that all knowledge should be proven against reality and that knowledge must be independent of the individual are central to the definition of scientific knowledge in the scepticism movement. The medical specialists who wrote the article – at least one of whom was active in the scepticism movement – use these rules of realism and the independence of knowledge to mark the unscientific elements of therapeutic touch and to create a boundary between emotional and individual-dependent belief medication treatments and scientifically precise medical knowledge.

Towards the end of the section ‘Basis in nurse and nursing science’, therapeutic touch is connected with religious beliefs:

The chakras of Indian mysticism (‘they are holes that connect us to a world of finer energy’) are part of therapeutic touch, the origin of which indeed is in the Indian *prana*, ‘the energy of life’. (Saano, Veijo and Puustinen, Raimo 1997. Belief medication – the new direction for nursing? The example of therapeutic touch. *Suomen lääkärilehti [Finnish Medical Journal]* 18–19, 2306)

The use of the expression ‘mysticism’ connects therapeutic-touch treatment with a religious life that strives for immediate connection with some divine being. The notion demonstrates a blurring of the boundaries between scientific facts and magical beliefs. The sentence in parentheses, starting with ‘they are holes...’, is used as an example to demonstrate the style of argumentation in the therapeutic-touch book. The evaluative comparative ‘finer’ in connection with energy illustrates the kind of reasoning used in the therapeutic touch book to explain supernatural phenomena that are inexplicable through natural science. The metaphorical expression ‘world’ indicates a presupposition that there exists a world outside the actual world, which reveals an expectation that a book on treatment should use the concept of reality that is used in the natural sciences and should thus belong to the community of natural science. The expression connects the therapeutic-touch book with religious belief in a higher existence, and thus demonstrates the breaking of the boundary between science and religion.

The addition ‘indeed’ places weight on the verb ‘is’, emphasising that therapeutic touch belongs to mysticism instead of to the reality of natural science’s world view, which generates a boundary between scientific knowledge and mystical beliefs. The quotation marks in connection with the last expression in the excerpt, ‘the energy of life’, indicate that the expression is directly taken from the therapeutic-touch book, and that this is a belief that does not belong in a scientifically based text. The quotation marks differentiate the text of the therapeutic-touch book from the medical specialists’ scientific views.

By presenting the quotation, the medical journal article emphasises that it is expected that the natural scientific concept of reality will be part of the understanding of the medical journal’s general readership. The quotation in parentheses illustrates that the therapeutic-touch book mixes reasoning about the supernatural with scientific reasoning, and demonstrates that the book violates the boundary between the scientific and the unscientific. The excerpt also connects the therapeutic-touch book with mysticism related to religious beliefs, and thus strengthens the boundary between science and religion.

The section concludes:

The textbook on therapeutic touch is based on a thesis in the University of Tampere’s department of nursing science. (Saano, Veijo and

Puustinen, Raimo 1997. Belief medication – the new direction for nursing? The example of therapeutic touch. *Suomen lääkärilehti* [Finnish Medical Journal] 18–19, 2306)

This sentence is declarative in style, and represents a shift from the evaluative style of the other excerpts. In the context of the analysis of the therapeutic-touch book, the sentence generates the impression that as violations of the boundary between the scientific and unscientific, science and magic, and science and religion have all been evidenced in the preceding text, the reader will have been led to the conclusion that the therapeutic-touch book is unscientific, and that it would be impossible to regard it as an acceptable textbook or as having been based on a thesis.

The reader is persuaded to draw the conclusion that a thesis with such evident connections with unscientific knowledge could not be accepted as a thesis at the university. With its declarative style the sentence evokes surprise in the reader by contrasting the previous analysis of the book's unscientific nature with the decision of the University of Tampere's department of nursing science to accept the thesis. The article thus raises questions about the criteria for scientific theses in the nursing science department. The questioning is made more concrete by localising it. With its surprise-effect style, the sentence emphasises the difference between nursing science's criteria for the evaluation of knowledge and the criteria of the medical specialist community, by presenting nursing science in such a way as to give the impression that the discipline does not follow the principles of the demarcation of science and instead generates its own principles, which depart from scientific criteria. Thus the sentence acts to distance nursing science from the scientific community.

Overall the medical journal article specifies the boundary between medicine and belief medication: first the characteristics of medical practice are specified, and then the characteristics of unscientific knowledge are presented as being in contrast with those practices. The ending of the section aims to evoke surprise in the reader at nursing science's local violations, and to make the reader suspicious of the discipline.

The second text evoking suspicion towards the discipline of nursing science is from the *Sceptic* editorial. The editorial first analyses a seminar, moves on to the therapeutic-touch book, and then analyses the PhD procedure with the fasting thesis and suggests that there has

been a reversal in the direction of nursing science. My analysis here concentrates on the evaluation of the therapeutic-touch book. The editorial starts by stating that the book speaks of a new nursing scientific concept of the human, and that it has been published as part of a series of textbooks aimed at students of nursing science. The editorial continues:

According to Rautajoki, therapeutic touch is holistic nursing, in which 'the human is taken into account as a whole and unique individual with needs, emotions and worries'. She defines therapeutic touch as a method of treatment in which 'through the handling of the energy field, it is intended to activate the self-help abilities of the patient. In therapeutic touch the energy field around the body of the patient is evaluated, possible blockages are removed from the energy flow and, when needed, the energy field is balanced via energy exchange.' (Ollikainen, Marketta 1996. From the editor. *Skeptikko* [*Sceptic*] 3/96, 7)

The expression 'according to' depicts the journalist as a messenger who has nothing to do with the contents of the book, and personifies the views in the book's author. The second sentence starts with the personal pronoun 'she', identifying the views with one single person. The editorial utilises direct quotations from the therapeutic-touch book, and through them evokes doubt about the book as a piece of scientific research. All three quotations taken from the book are selected so that they can be found in both the book and the Masters thesis.⁴⁴ This implies that both the book and the thesis are regarded by the journalist as stretching the boundary between science and non-science. The quotations in themselves demonstrate views that are for some reason interesting to a reader from the scepticism movement.

The first quotation uses the concept 'holistic' as an example of a central concept in treatments outside the scientific sphere. The other quotation demonstrates that the concepts 'energy field', 'energy flow' and 'energy exchange', which are unfamiliar to the scientific community, are used as if they were accepted and used generally by scientists. The description of the therapeutic-touch method shows that the method is described as if it were generally accepted and usable, even though it takes supernatural beliefs as self-evident and uses concepts that are not approved by the scientific community. Thus the quotations construct a boundary between unscientific terminology and

⁴⁴ The first two quotations are from page 2 of the thesis and page 9 of the book. The third quotation is from page 19 of the thesis and page 35 of the book.

supernatural beliefs that are not accepted by the scientific community on the one hand, and scientific factual claims approved by the scientific community on the other. The scientific world view is seen as the dominant method of evaluation, and the theories in question as having been sidelined on the basis of evaluation through the scientific community's terminology and belief system.

The editorial goes on:

Like this Rautajoki. It is not a question of just any imaginary energy field, but of one that can be concretely observed. She writes: 'The invisible energy is made visible through electro-photography, which is named Kirlian photography after its developers, Semejon and Valentina Kirlian. Kirlian photography also further clarifies the essence of the energy field.' (Ollikainen, Marketta 1996. From the editor. *Skeptikko* [*Sceptic*] 3/96, 7)

The first sentence powerfully connects the book and quotations to the individual author. The negation 'is not' demonstrates that the author acts as if she believed in the energy field theory. The second sentence includes the adjective 'imaginary', illustrating the book author's belief in the concept of energy fields, and demonstrates that she does not question it in any way. The adverb 'concretely' indicates the book author's belief that the energy field is a phenomenon that can be objectively observed with certain scientific methods, and demonstrates that the author's belief in terminology and methodology that are not approved by the scientific community is a central shortcoming of the book. The multitude of quotations generates the effect that the adherence to unscientific beliefs and theories is generalised throughout both the book and the thesis.

In the third quotation, Kirlian photography is referred to as if it were a credible way to research the phenomena in question, and as if scepticism regarding its relevance as a scientific imaging method might not have arisen. Likewise, the terms 'invisible energy' and 'energy field' are used as if they were completely credible and much-used concepts in scientific texts in general, even though concepts that refer to supernatural phenomena and methods that allegedly prove the existence of the supernatural are neither used by scientists nor included in the scientific world view.

By presenting a quotation that portrays the book as believing in supernatural phenomena, the *Sceptic* editorial generates the impression that the book's author regards such phenomena and terminology as accepted by the scientific community, even though they are not. Thus

by presenting the quotation, the editorial associates the book and its author with unscientific and pseudoscientific theories and beliefs. This gives the effect that the author is either unfamiliar with the characteristics of scientific research or is consciously bringing unscientific beliefs into the scientific sphere. By using the quotations, the editorial aims to convince the reader of the unscientific beliefs in the book and of its possible attempts to present pseudoscientific claims as scientifically proven facts.

The last excerpt concludes the evaluation of the book:

Rautajoki talks about human astral planes without in any way wondering at their existence. She seems totally in the dark about human anatomy and the laws of physics. However, the book is based on her Masters thesis, which was conducted at the University of Tampere's department of nursing science. (Ollikainen, Marketta 1996. From the editor. *Skeptikko* [*Sceptic*] 3/96, 7)

The use of the author's surname in the first sentence, and the use of the personal pronoun 'she' in the two last sentences, identifies the author as personally responsible for the claims and views presented in the book. The extreme expression 'without in any way' demonstrates that the book fails to challenge the idea of astral planes, even though this would be expected of a book based on a Masters thesis. The expression indicates that the same kind of failure occurs repeatedly throughout the book. The impression of a total absence of confrontation with the idea of astral planes is further enhanced with another extreme expression, 'totally in the dark'. This notion conveys that the author of the book is undisputedly unaware both of anatomy as a branch of medicine and of the laws of physics. The indisputability strengthens the impression that it should be expected that a Masters thesis in nursing science will understand physics, human anatomy and scientific thinking more generally.

This is further elaborated in the last sentence with the adverb 'however', expressing astonishment that the book was based on a nursing science Masters thesis. This causes confusion in the reader and gives an impression that the criteria applied to nursing science Masters theses are obscure. Thus it constructs the discipline as blurring the boundary between scientific fact, here represented by the laws of physics and anatomical truth, and magical beliefs in the form of astral planes and energy flows.

As a whole, the excerpts from the therapeutic-touch book in the *Sceptic* editorial generate the impression of a violation of the boundary between the rational and the magical. The editorial elucidates the boundary between science and belief in order to present nursing science as potentially crossing that boundary. The last sentence evokes suspicion towards the discipline of nursing science and presents it as having failed to react to the infiltration of science by unscientific phenomena, both in a Masters thesis and in a book published as part of a series of textbooks for nurses. This generates the impression that nursing science is negligent in relation to unscientific phenomena.

The university bulletin article is the third text evoking suspicion about nursing science's abilities to guard against unscientific knowledge. The journalist in this case is the same person who wrote the *Sceptic* editorial. The excerpts are taken from the beginning of the article introducing the therapeutic-touch book, and are analysed here in four parts. The university bulletin article states:

Anja Rautajoki, who works as a teacher in the Tampere institution for healthcare education, claims in her new book *Therapeutic Touch* that even **Hippocrates** noticed a characteristic in his hands which seemed to draw away pains and various impurities when he laid them on the sore spot. Jesus healed, as is known, by placing his hands on the sick, and it is said that **Florence Nightingale** also considered the task of the nurse to be to care for the patient by supporting her healing powers. (Ollikainen, Marketta 1996. Spiritual healing for nurses? *Yliopisto [University]* 20/96, 38–39)

The first sentence categorises the author of the therapeutic-touch book as a teacher in a healthcare education institution, presenting her as an instructor of nursing students. Then a direct quotation from the therapeutic-touch book and Masters thesis is presented.⁴⁵ Forstorp (2005, 52) argues that for sceptical readers, one of the characteristics of pseudoscience is deviance from the rules that knowledge should be independent of the individual and that blind faith should not be placed in authorities; rather, researchers should verify their knowledge.

The names of the individuals in the quotation are authorities commonly referred to as a founder of medicine (Hippocrates), a teacher and healer (Jesus) and a founder of the nursing profession (Nightingale), which associates the book with faith in authorities. The persuading tools 'even', 'as is known' and 'also' in relation to these

⁴⁵ The quotation is taken from page 7 of the book and page 1 of the thesis.

names indicate faith in their authority and a failure to challenge their message. These tools also reveal a lack of attention to the length of time that has passed since these authorities made their pronouncements. This demonstrates a reliance on historically outdated anecdotes instead of reliable and modern sources of information. The use of the authorities' names indicates the ascription to certain persons of the power to decide what is true and false, instead an adherence to knowledge that is independent of the individual. Thus the quotation demonstrates a violation of the sceptics' scientific world view, which is dominated by natural science's regulations regarding scientific knowledge. The boundary between the scientific and the unscientific is clarified with the help of the quotation, which reveals characteristics typical of unscientific knowledge in its anchoring of the facts in certain authorities and in its failure to relate knowledge to the passage of time and the latest research findings.

The article continues:

In Finland's official healthcare, this kind of theory of healing powers is not yet accepted without a hiccup. Rautajoki offers a package in which ethereal energy flows, gem therapy, cosmic dimensions, telepathy, long-distance healing, Kirlian photography and other phenomena of the so-called New Age movement are in perfect harmony. 'Multidisciplinarity' is also included. According to Rautajoki, the therapy can be explained through evolutionary theories, system theories, oriental philosophies and quantum physics. (Ollikainen, Marketta 1996. Spiritual healing for nurses? *Yliopisto [University]* 20/96, 38–39)

The adjective 'official' implies that the healthcare system utilises certain authorised criteria of knowledge in the care of patients. The negation 'is not yet accepted' conveys that one day, if the treatment is made official and approved by scientific research, it might be brought into the group of official healthcare treatments. The notion indicates that the criteria of official healthcare would have to be radically changed in order for the theory to be included in official treatments. This constructs the therapeutic-touch book's criteria for knowledge as being far from those of official healthcare, which generates a boundary between official-scientific and unofficial-unscientific knowledge. The metaphorical expression 'a hiccup' gives the impression that an attempt to make the theory of healing powers official would arouse doubts. The notion indicates that it is expected

that the theory of healing powers would arouse opposition in the official healthcare system, which distances the theory of healing powers from scientific knowledge and creates a boundary between scientific and unscientific theories.

The metaphorical expression ‘package’ implies that the issues have been haphazardly bundled together, indicating that the whole has been assembled from various elements and that it lacks consistency and criticalness. This notion alienates therapeutic touch from other treatments that combine elements that are less eclectic. The expression ‘also’, and the notion ‘multidisciplinarity’ in inverted commas, denote that another distinguishing mark of pseudoscience can be identified in the book. The inverted commas suggest that multidisciplinarity is used in the book in a different way than it is normally used in the scientific community, and the word is ironised or presented as incongruous. The use of inverted commas indicates that it belongs to something other than the expected scientific style.

The excerpt provides two lists of items that are presented as having been combined in the book as elements of the theory of healing powers. The first list produces a category of ‘New Age movement’ phenomena, conveying that in the book it is more a question of combining various materials from religious perceptions and views of life than of scientific research. The list labels the therapies used by the book as unscientific, and excludes the items in the list from the realm of scientific knowledge. Thus the list of ‘New Age’ elements draws the boundary between the scientific and the unscientific. The elements in the first list have been pronounced pseudoscientific by the Finnish scepticism movement.⁴⁶ The presentation of the list in the university bulletin article links it with the scepticism movement, and thus highlights the movement’s attempt to reject pseudoscience and to differentiate scientific from unscientific knowledge.

The excerpt ends with a second list of four broad theories that comprise the background of the therapeutic-touch treatment: evolutionary theory, which comes from biology; systems theory, which originally also comes from biology; oriental philosophies, which are associated with New Ageism and unknown philosophies; and quantum theory, which comes from physics. This list indicates that it was expected that the theories would require broad explanations and

⁴⁶ These therapies have been classified as belief medicine in a book published by the Finnish scepticism movement (see Saano 1997, 119). That book’s author is also one of the medical specialists who wrote the medical journal article analysed above.

that they would have logical and justified anchorage. The list of theories demonstrates that their use is unjustified and that the logic behind the combination of the different theories cannot be followed, which indicates an unscientific agglomeration of knowledge.

As a whole, the excerpt generates an impression of incongruity between therapeutic touch and official healthcare as well as the scientific style of reasoning. The category of the New Age demonstrates that therapeutic touch belongs to the unscientific domain. The list of theories further establishes the unscientific style of the therapeutic-touch book. Boundary-work between the scientific and the unscientific is conducted in order to argue for the unscientific nature of the book.

The next excerpt concentrates on the Masters thesis:

Rautajoki's book is based on her Masters thesis, which was completed in the University of Tampere's department of nursing science in 1993. The supervisor of the work, Irma Kiikkala, who currently works at the Research Centre for Welfare and Health, has not had time to familiarise herself with Rautajoki's book. Nevertheless she considered the Masters thesis a good one. 'The work was a conceptual analysis of the therapy in question. It was well done and fulfilled all the criteria required of a Masters thesis,' she says. (Ollikainen, Marketta 1996. *Spiritual healing for nurses? Yliopisto [University] 20/96, 38–39*)

The first sentence of the excerpt has a declarative style, connecting the Masters thesis with the book and indicating that either the book or the thesis could equally have received the Humbug Award. The excerpt then introduces the supervisor of the Masters thesis, identifying her present position in a prestigious research organisation in the field of healthcare. The negation 'has not had time to familiarise' limits the supervisor's evaluative statements and distances her evaluation of the book from that of the thesis. The expression 'nevertheless' indicates that, regardless of the Humbug Award, the thesis could be evaluated as good, which contrasts with the impression given by the journalist of the unscientific nature of the book and the thesis. The first sentence in the quotation characterises the method of the thesis as conceptual analysis and classifies the thesis research in terms of qualitative research methodology. The method of conceptual analysis originated in philosophy and is used in nursing science to scrutinise the origin and use of concepts (Margolis and Laurence 2011).

The last two sentences of the excerpt, separated with quotation marks and ending with the expression 'she says', give the impression that the journalist interviewed the nursing scholar for the article and that the sentences are direct quotations from the interview. The evaluative adjective 'well done' implies that the Masters thesis was unambiguously and undisputedly good work. The extreme expression 'all' demonstrates that there were no criteria that were not fulfilled by the thesis, which strengthens the impression of the good quality of the thesis. The direct quotation from the nursing scholar generates the impression that the scholar thinks highly of the Masters thesis and implies that she supports the book, which has been evaluated as unscientific by the journalist from the scepticism movement. The next sentence illustrates the distance between the journalist's perception and that of the nursing scholar:

Rautajoki's book hardly deserves to be characterised as scientific because she moves far outside traditional science. (Ollikainen, Marketta 1996. *Spiritual healing for nurses? Yliopisto [University]* 20/96, 38–39)

The evaluative adjective 'scientific' in relation to the characterisation of the book suggests an expectation that the attributes of science should have been found in the book, but the expectation is not met and instead the book is seen to be outside science. The notion contrasts with the previous quotation from the nursing scholar stating that the work used conceptual analysis. This gives an impression that the journalist does not consider conceptual analysis a scientific method or that she has failed to distinguish the scientific language connected with conceptual analysis. The expression 'hardly deserves' strengthens the impression that the journalist does not understand the notion of conceptual analysis as a scientific characterisation. The metaphorical expression 'far outside' implies that in the journalist's understanding the therapeutic-touch book belongs to another extreme than scientific texts and exemplifies the unscientific genre, and it powerfully excludes the possibility that the book might fall within the scientific sphere. The evaluative adjective 'traditional' contrasts with the earlier notion of 'New Age' and further associates the book with the genre of unscientific texts.

The incongruity between the quotation from the nursing scholar and the next sentence generates an impression that the journalist has failed to understand the nursing scholar's scientific characterisation of

‘conceptual analysis’, and that she has instead classified it as unscientific terminology that deserves a place outside science with other unscientific entities. Thus the notion engenders suspicion towards nursing science’s characterisation of scientific knowledge and methodology, and exhibits the dominance in the scepticism movement of the natural scientific world view as an analytical tool to evaluate the characteristics of science. Thus the notion indicates that the book is unscientific in the scepticism movement’s sense, which excludes other systems of knowledge and alternative views of science that use qualitative research terminology. The discipline of nursing science is presented in this argumentation in a dubious light, and therefore the article evokes suspicion towards nursing science’s criteria for scientific knowledge.

As a whole, the university bulletin article depicts the differences between scientific and unscientific knowledge by explicating the therapeutic-touch book’s unscientific style and relationship with unscientific theories and methodologies. By presenting the similarities between the book and the Masters thesis, the article evokes suspicion towards nursing science, and this is emphasised by the statement revealing the mismatch between nursing science’s characterisation of science and that of the scepticism movement. The nursing scholar in question is labelled as a promoter of unscientific research.

It is characteristic of this form of boundary-work between science and other knowledge systems to evoke suspicion towards nursing science. The excerpts from the medical journal article, the *Sceptic* editorial and the university bulletin article follow the pattern proposed by Forstorp (2005) for depictions of pseudoscience: they start by presenting evidence of unscientific knowledge, and after that they evoke suspicion towards the discipline in which the unscientific elements have arisen, in this case nursing science. They arouse interest in the discipline of nursing science as a potential future habitat for unscientific knowledge, and evoke suspicion towards it.

The incursion of unscientific knowledge into nursing science

The third form of boundary-work between science and other knowledge systems demonstrates the incursion of unscientific knowledge into nursing science. This form was found in the *Sceptic*

article justifying the Humbug Award, the university bulletin article and the medical journal article. The first text demonstrating the incursion of unscientific knowledge into nursing science is an article by the Finnish Association of Sceptics outlining its reasons for the giving the Humbug Award to the publisher of the therapeutic-touch book. The text was published in *Sceptic* immediately after the award. Parts of the text were also published in Finland's main newspapers.⁴⁷ At the beginning of the article the Association announces that it has decided to grant the Humbug Award to the publisher Kirjayhtymä for publishing the book *Therapeutic Touch*. Then the article argues that, in accepting a work such as this for its series of books aimed at social and healthcare personnel, the publisher has blurred the boundary between work intended for healthcare education and work that can be considered pseudoscientific. After this the article specifies the contents of the book and presents quotations from it. The article argues:

The Association considers worrisome the claim that energy, energy field and energy change might be generally accepted concepts in nursing science. The growing popularity of therapeutic touch is justified in the book on the grounds that, among other things, it brings the energy concept closer to practical nursing. In this way the abstract ideas of nursing science are concretised into a living whole, the author says. (Unknown author 1996. Humbug Award 1996. *Skeptikko* [*Sceptic*] 4/96, 10–11)

The first sentence uses expressions from the therapeutic-touch book indirectly.⁴⁸ The evaluative adjective 'worrisome' presents concern that the concepts used in the book might be common concepts in nursing science. This adjective presents apprehensions about the conceptualisation of nursing science, the status of the discipline and its ability to guard against unscientific knowledge.

The expression 'generally accepted' presents the use of the concepts 'energy, energy field and energy change' as part of the conceptual repertoire of nursing science. The argumentation about the general acceptance of the concepts appears to be an attack on nursing science's authority over its own concepts. With the expression of

⁴⁷ *Aamulehti* 12.12.1996, page 19, and *Helsingin sanomat* 12.12.1996, page A4.

⁴⁸ The quotation is taken from page 10 of the book: 'Terapeuttilisen kosketuksen tunnetuksi tekeminen on tärkeää myös siitä syystä, että vaikka käsitteet 'energia', 'energiakenttä' ja 'energiavaihto' ovat yleisesti hyväksytyjä hoitotieteessä, ne ovat jääneet käytännön hoitotyölle vieraisiksi.'

worry about the general acceptance of the concepts, attention is drawn to their unscientific nature. The concepts are labelled as markers of unscientific knowledge: wherever the words ‘energy’, ‘energy field’ or ‘energy change’ appear, concern should be expected. The conditional verb ‘might be’ expresses doubt that all nursing science actors do agree that these concepts are generally accepted in the field. Instead it indicates that the concepts might not be accepted to the extent that the therapeutic-touch book author has indicated. The quoted words are used to evoke astonishment at their general acceptance in nursing science and to connect the book with unscientific thinking.

The expression ‘among other things’ creates the impression that there are many ways in which the book tries to bring concepts labelled unscientific into nursing science. The comparative form of the adjective ‘closer’ indicates that the therapeutic-touch book aims to seize the territory of practical nursing from nursing science with the unscientific concept of ‘energy’. The adjective ‘abstract’ illustrates how the therapeutic-touch book connects the concept of energy to nursing science.

The *Sceptic* article produces understanding for the Humbug Award by demonstrating the ways in which unscientific elements infiltrate nursing science in the therapeutic-touch book. It also draws attention to the nursing science’s potential to put the whole of science on the worrisome track of unscientific knowledge production. The article draws attention to nursing science’s potential to become a field where unscientific knowledge is brought into scientific knowledge. Nursing science appears as a weak field of knowledge production that needs help from the outside to define the boundary between science and non-science. This effect is strengthened towards the end of the article:

According to the Association, bringing in this kind of new therapy as if it were a generally accepted treatment elsewhere weakens the credibility of the whole of healthcare education. As a young discipline, nursing science is expected to be very alert and critical as various pseudoscientific teachings try to formalise their status in science. (Unknown author 1996. Humbug Award 1996. *Skeptikko* [*Sceptic*] 4/96, 10–11)

The expression ‘as if’ indicates doubt about the general acceptance of therapeutic touch in healthcare elsewhere. It generates the impression that the therapeutic-touch book overestimates the general acceptance of therapeutic touch. The verb ‘weakens’ implies an expectation that new knowledge should authenticate healthcare education, but in the

therapeutic-touch book this has not happened, and instead the knowledge casts the credibility of the field in a dubious light. The extreme expression 'the whole of healthcare education' highlights the power of one book to erode the credibility of a scientific field, and presents credibility in the eyes of different healthcare actors as a central aim of science. The first sentence thus demonstrates the broad consequences of the incursion of unscientific elements into science through nursing science.

The adjective 'young' in connection with nursing science indicates a belief that a young discipline is more likely to be attacked by 'pseudoscientific teachings', evoking worry about the discipline's abilities to guard against unscientific elements and thus suggesting the incursion of unscientific knowledge through nursing science. The evaluative adjective 'alert' presents the expectation that a scientific discipline should be vigilant. The field of nursing science is depicted as careless and inactive in its work against unscientific knowledge. The evaluative adjective 'critical' associates nursing science with an uncritical and blind attitude towards unscientific knowledge. Thus these notions generate an impression of nursing science in which alertness and criticalness are neglected and the distinction between science and non-science has been weakly made.

The excerpt produces the expectation that nursing science ought to be alert and critical towards pseudoscientific elements. The adjective 'young' also generates the impression of a callow beginner discipline in which pseudoscientific elements find an opportunity to occupy scientific territory. This expectation is characterised in terms of being 'very alert', indicating that nursing science has not met the expectations that it will defend itself against pseudoscience and instead has been less observant than expected, and hence some unscientific elements have infiltrated into nursing science. The adjective 'young' also contrasts young with old disciplines, implying that old fields are sufficiently mature and able to protect themselves from pseudoscience whereas young disciplines are associated with innocence and credulity, causing confusion in the face of pseudoscientific teachings. The passive tense 'is expected' does not identify who expects nursing science to be alert and critical. One possibility is that the older and more established fields expect this of nursing science.

The excerpts from the *Sceptic* article characterise nursing science as a 'young' discipline in which, against expectations, the incursion of unscientific knowledge is possible. As a key to identifying non-science

in nursing science, the article proposes alertness and criticalness, which are depicted as insufficiently present in the field. Thus the abilities of nursing science to draw the boundary between science and non-science are criticised and questioned. The article leans on the principles of the scepticism movement and the rational scientific world view that excludes alternative views, and it presents nursing science as exemplary of a young and inexperienced field through which unscientific knowledge seems to be able to find a new route into science.

The university bulletin article is the second text demonstrating the incursion of unscientific knowledge into nursing science. The article is entitled ‘Spiritual healing for nurses?’ and analyses the therapeutic-touch book from the perspective of the principles of scepticism. The two excerpts analysed here are taken from a part of the article that interviews a professor of nursing science at the University of Helsinki.⁴⁹ The excerpt first introduces the professor and then quotes her:

Professor of nursing science Marja Sihvonen, from the department of general practice and primary healthcare at the University of Helsinki, smiles at the claims that ‘energy field’ is somehow a generally accepted concept in nursing science. ‘In education institutions a big group of these different nursing models may turn up when theoretical grounds are being sought for teaching. In teaching focusing on practical work, they nevertheless remain very distant from the students. Naturally they give a doubtful picture about the level of teaching if these models are used uncritically,’ Sihvonen says. She emphasises that in nursing science too, only scientific research can reveal whether a model is functional or not. (Ollikainen, Marketta 1996. *Spiritual healing for nurses? Yliopisto [University]* 20/96, 38–39)

The excerpt starts by presenting the interviewee in the reassuring category of professor, which makes her statements particularly powerful and gives her the authority to evaluate the status of the discipline. The term ‘energy field’ is written in inverted commas, implying that the term is being given an ironic meaning, which also makes the professor’s smile understandable. This generates the

⁴⁹ To be more precise, the professorship was in nursing theory. At the time of the article, the nursing science programme at the University of Helsinki was about to be closed. The programme had been at risk due to conflicts over two professorships donated by two healthcare schools and the nurses’ trade union. There had also been a debate about students’ entry qualifications, and these conflicts resulted in the termination of the professorship in 1998 (Laiho 2005, 227–228, 240).

impression of the unscientific nature of the concept. The evaluative expression 'big group' quantifies the theoretical models and makes their number in education institutions seem great. The expression 'turn up' engenders the meaning that the nursing models appear even though nobody has actively created them, and that they penetrate nursing without anybody deliberately advocating them. This presents the role of education institutions as passive in the struggle against unscientific knowledge.

The notion of models may relate to the use of educational material in healthcare education institutions (i.e. from the 1990s onwards, polytechnics or universities of applied sciences). Models of nursing science refer to the theories that present the central concepts of nursing and their relation to patient care. The educationalist Katariina Raij (1996, 128) argues that nursing science in these institutions was largely organised so that students were familiarised with the application of models which were not necessarily familiar to nursing practitioners. In many cases it was students who were the first to bring nursing models into practice during their placements. Thus nurse practitioners became familiarised with nursing science through the understanding of the students, who were themselves just learning the models and were not familiar with their philosophical underpinnings. The spread of nursing science's theoretical thinking was thus based on superficial knowledge of the theories, with no good opportunities either to criticise or to apply them. The majority of nursing teachers had not undergone theoretical nursing education at universities and therefore were not familiar with the scientific domain or its criteria for research.

The reservation 'nevertheless' implies that if teaching were more focused on theoretical issues, the models would be better known, but as teaching in healthcare education institutions focuses on practical issues, the models remain unknown to the students. This generates a boundary between education at university level and at healthcare education institution level. The reservation 'nevertheless' indicates that since there are so many models, it might be expected that the models would become more popular, but this expectation has not been met and the models remain unknown. The statement thus diminishes the role of the large group of nursing models in healthcare education institutions. The extreme expression 'very distant' implies an expectation that the models would have become familiar to the students, either because there are so many of them or for some other

reason, but the opposite has been the case. This furthers the impression of the nursing models' insignificance in education institutions and diminishes their role in teaching.

The evaluative adverb 'naturally' indicates that it is considered normal that an uncritical use of the models should evoke doubt, which presents the dubiousness caused by the uncritical use of the models as understandable. The evaluative adjective 'doubtful' connotes an expectation that material taught in education institutions should be incontrovertible. The adverb 'uncritically' raises the possibility that some actors might sometimes use the models without being critical. Thus the professor has stated her opinion on the implementation of nursing science in educational institutions other than universities, outsourcing the problem of uncriticalness about nursing models to lower-level educational institutions, which generates the impression that healthcare education institutions are potential platforms for the dissemination of unscientific knowledge.

The last sentence argues for the role of universities in multiform nursing education by highlighting the role of scientific research in protecting nursing against unscientific attacks. The addition 'also' links nursing science to the norms of the broader scientific community, and demonstrates nursing science's ability to protect its own boundaries and the power of scientific research to validate knowledge as true or false, useful or useless. The notion distances the uncritical use of nursing models in healthcare education institutions from the use of knowledge on the basis of scientific research in universities, by emphasising criticism as a central characteristic applied by science and lack of criticism as a potential attribute of healthcare education institutions.

The expression 'only' indicates that the order of knowledge production is comprised of a procedure in which knowledge that is not approved can emerge at the outset and will then be exposed to scientific research, after which the research will give final verification or approval as to whether the knowledge is useful or not. The order of knowledge production in scientific research is presented by the professor of nursing science. The actual steps that lead unscientific knowledge from education institutions into the university are not specified, which generates an impression of the intermingled nature of nursing practical knowledge and nursing scientific knowledge.

As a whole the excerpt demonstrates that nursing science belongs to the broader scientific community. The verification method is

provided as a tool for nursing science to protect itself against the unscientific knowledge which is attempting to infiltrate the domain of scientific knowledge through healthcare education institutions. The key to identifying the unscientific in nursing science is to maintain the scientific model for knowledge production and to use the verification and falsification method familiar from the natural sciences. The role of university scientific research appears to be that of identifying unscientific knowledge and cleansing the whole of the nursing field of unscientific research. The excerpt makes visible unscientific knowledge's route through education institutions and generates an understanding of nursing science's situation as it tries to protect the field from non-science. The healthcare education institutions are depicted as locations where unscientific knowledge may flourish and through which unscientific knowledge may try to usurp the authority of science. The authority of scientific knowledge is strengthened by the depiction of scientific knowledge as an institution in itself, protecting the whole sphere of nursing from unscientific knowledge.

The university bulletin article continues:

Sihvonen wants to make a clear distinction between scientific knowledge and these theories. 'What people believe in as the highest power of life is a totally different thing. It has nothing to do with science.' According to Sihvonen, the whole concept of 'therapeutic touch' is misleading people. 'It does not give an impression of energy flows, which nevertheless is what it is about. Touch is a fundamental part of communication between people, but it has to be natural, taking into account the other person. The idea that we would touch via some energy flow is very peculiar,' Sihvonen says. She wonders why touch as a whole should be explained in terms of some mystical energy flow. 'We can analyse the meaning of touch in relationships between persons just as well with the normal behavioural sciences.' (Ollikainen, Marketta 1996. Spiritual healing for nurses? *Yliopisto [University]* 20/96, 38–39)

The evaluative adjective 'clear' indicates that the distinction is not always made precisely, but is sometimes made in a blurred manner that obscures the boundary between scientific and unscientific knowledge. The notion 'clear distinction' emphasises the importance of determination in making distinctions between science and other theories. The expression 'highest power of life' connotes religiousness and relates the theories to religious thinking, which generates a boundary between science and religion. The extreme expression 'totally' suggests an indisputable difference between science and

religion, emphasising the distance between the two. The negation 'has nothing to do with' includes the extreme expression 'nothing', which portrays the distance between science and religion with science at one extreme and religion at the other. The excerpt illustrates how labelling or proving the other to be religious is a tool to protect science from unscientific knowledge.

The notion 'according to' emphasises the expertise of the person quoted as a professor of nursing science, and strengthens the impression that she belongs to the category of those who understand the nature of nursing science. The concept 'therapeutic touch' is placed in inverted commas, which implies that the expression is being used with an ironic meaning, emphasising the doubts connected with the basis of the concept. The expression 'misleading' implies that the theory about therapeutic touch deludes people on purpose, which gives an impression of deliberate and consciously deceptive fraud, distancing science from unscientific knowledge. The negation 'does not give an impression' presents an expectation that a theory-driven concept should be so clear that it could immediately be connected with the theory's central message, but in therapeutic touch this expectation has not been met, and the theory of therapeutic touch cannot be connected with energy flows simply through the name of the concept.

The distancing between the scientific and the unscientific is highlighted in the contrast pair 'natural-peculiar', which gives positive connotations to physical touch, which is connected with regular communication between people, and negative connotations to touch through energy flows. Physical touch is depicted as naturally occurring, but it is argued that energy flow touch requires religious beliefs that do not stand up to scientific scrutiny and are foreign to the communicative practices of everyday life. The contrast pair 'mystical-normal' in the last two sentences classifies the explanations provided by the theory of therapeutic touch and by scientific approaches. The scientific view is supported and given the positive connotation of normality, whereas the unsupported view is connected with the mysticism and religiosity that were previously ejected from the scientific sphere. The notion presents the help gained from behavioural sciences as key to protecting nursing science against unscientific knowledge. The excerpt differentiates science from religion, and uses religious labelling as a tool to protect nursing knowledge from unscientific knowledge. Moreover, the excerpt

produces strategic alliances with other disciplines as tools to protect nursing science from unscientific knowledge, and as a means to draw the boundary between scientific and unscientific knowledge.

As a whole, the excerpts from the university bulletin article depict nursing science in a situation where unscientific knowledge is trying to usurp the power and authority of science by means of the education provided in healthcare education institutions, which are separate from universities. The excerpts call attention to a method for the protection of science that protects the whole field of nursing from unscientific knowledge by depicting the order of knowledge production. In this order, science first tests the theories and justifies their applicability, and then the theories can be adopted for use in practical knowledge settings. The protection of science is used as a tool to protect the whole field – including scientific research, practical knowledge and its dissemination to nursing students – from unscientific knowledge.

Two excerpts from the medical journal article demonstrate the incursion of unscientific knowledge into nursing science. The excerpts are from a section entitled ‘Comprehensive care’. The medical journal article argues:

It is claimed that therapeutic touch is holistic care. By this it is not meant that in diagnosis and the allocation of care social circumstances, psychological status, the bodily aspects of the illness, hereditary effects, the influence of learned reactions etc. will be taken into account.

Holism in this case means a phenomenon that unites all the mechanisms of illness and the symptoms, and through which the patient can be cared for regardless of the causes of their symptoms. Holism also refers to spirituality, which in the case of therapeutic touch is first and foremost represented by the above-described development of the world view of the nurse, and possibly also the key concept of energy – detachment from materiality. (Saano, Veijo and Puustinen, Raimo 1997. Belief medication – the new direction for nursing? The example of therapeutic touch. *Suomen lääkärilehti [Finnish Medical Journal]* 18–19, 2306)

The excerpt uses the negation ‘it is not meant’ to establish the category of medicine. This emphasises that the category of belief medication was expected to include the same elements as the category of medicine. This implies that when the expectation was not met, it became important to make the categorisation. The category of medicine describes the comprehensiveness of modern medicine by presenting a list of things that are taken into account in the diagnosis

and care of patients. The list includes five items, the first three of which connect the category of medicine with the view of the human as a social, mental and bodily whole. The fourth aspect, 'hereditary effects', takes into account genetics as a way to explain symptoms. The fifth aspect, 'learned reactions', connotes psychological explanations for illness. The abbreviation 'etc.' generates an impression that the list could be even longer, but that due to lack of space all of the items have not been listed. The list as a whole generates an impression that medical examination understands the human being as a versatile whole, and that it is comprised of a careful evaluation of the causes of illness and effects relating to the occurrence of deviance in the organic whole of the human being.

By contrast, the category of belief medication is characterised by the unification of all explanations for illness. This is presented as a violation of the diagnostic method of medicine to inspect first the cause and then the effect of the illness. The adverb 'regardless of' indicates that in the belief medication method, the causes are not seen as key to understanding the illness but instead are neglected, which weakens the credibility of the belief medication method by comparison with the medical method. The three items mentioned at the end of the excerpt – spirituality, development of one's world view and detachment from materiality – connect this form of reasoning with the characteristics of pseudoscience, violating the rule that all knowledge should be tested against reality. As a whole, the excerpt argues for the differentiation between medicine and belief medication by categorising the concept of holism as it is understood in medicine and in belief medication. The excerpt evokes the impression that nursing science is unable to protect itself against unscientific knowledge by presenting medicine's standards and boundaries of scientific knowledge.

The medical journal article continues:

In the case of therapeutic touch, holism has yet an additional dimension. In the United States, therapeutic touch became a symbol of the independence of nursing science among nurses and nursing scholars. The method was developed by women, and it was offered especially in a field dominated by women, at the same time invoking characteristics considered typical of women concerning the personal characteristics of the therapist. Those questioning the functioning and validity of therapeutic touch have been accused of the chauvinistic oppression of feminist nursing science (L.A. Rosa 1995. 'Therapeutic touch.' *Sceptic* 3 (1): 40–49). (Saano, Veijo and Puustinen, Raimo 1997. Belief medication

– the new direction for nursing? The example of therapeutic touch.
Suomen lääkärilehti [Finnish Medical Journal] 18–19, 2306)

The additive expression ‘yet an additional’ generates the impression that what follows will complement the analysis of nursing science in terms of ‘the candidates for belief medication’, ‘the basis of therapeutic touch in nursing science’ and the declarative statement about the ‘thesis in nursing science’ analysed previously. The excerpt then localises the conflict over therapeutic touch in the United States. The localisation is further specified by presenting the reference at the end of the excerpt, which connects the train of thought with an article in the journal of the American scepticism movement.⁵⁰ The article referred to discusses a case in the early 1990s when sceptics were trying to combat non-science in nursing science. The article describes how the sceptics pointed out the unscientific elements of therapeutic touch and tried to explain them to the nursing science community, without success. The sceptics lost the battle, which included attempts to stop the inclusion of therapeutic touch on the continuing education curriculum at the University of Colorado.

In the medical journal article, this case exemplifies the arrival of therapeutic touch as a popular treatment in the United States. The episode is presented in the past tense, which generates the impression that the episode was limited to one occasion, yet it is important enough to be mentioned as a warning example for Finnish nursing science. The expression ‘symbol of independence’ connotes ethnic symbols of independence such as flags, national anthems and banners. These symbols act as signs or brands by which a group of persons can be identified. By calling therapeutic touch a symbol of independence, the excerpt generates the impression that on this occasion the American nursing science community could be identified by its use of this treatment. The preposition ‘among’ conveys that nursing science is a united group of individuals. This generates the impression that American nursing science in particular holds to the symbol of independence that has been identified in the same sentence as therapeutic touch. In the context of the article, which is scrutinising the unscientific nature of therapeutic touch, this argumentation connects nursing science with activities that do not correctly

⁵⁰ Linda A. Rosa 1995. ‘Therapeutic touch: sceptics in hand to hand combat over the latest New Age health fad.’ *Sceptic* 3 (1), 40–49. The episode described by the article is also used (but not referred to) in the university bulletin article.

differentiate the scientific from the unscientific, magical or religious. Therefore the local episode in American nursing science acts to present the potential that nursing science might become involved with the unscientific community and become connected with the unscientific treatment context of belief medication.

The excerpt uses the expressions 'developed by women', 'dominated by women' and 'typical of women' in addition to 'feminist' in connection with therapeutic touch to present the incident over therapeutic touch in American nursing science as a gendered question, and to repeat the implication that nursing science has a feminist agenda. The contrast pair 'chauvinistic-feminist' is used to resolve the controversy about therapeutic touch. The word 'oppression' in connection with 'chauvinistic' connotes subordination, tyranny and undeserved mistreatment by those who have questioned the usability and validity of therapeutic touch as a treatment. Through the use of the term 'oppression' with reference to those who have questioned therapeutic touch, those who are questioning the treatment are presented as the victims of the controversy, as having lost out to the feminist agenda. The labels 'typical of women' and 'feminist nursing science' are applied to those who have drawn on therapeutic touch as a symbol of the independence of nursing science, have referred to the personal characteristics of the therapist as feminine attributes, and have used these notions to defend the use of the treatment in nursing. The feminists are presented as the stronger party in the controversy, as having been successful in convincing the audience of the treatment's effectiveness and of women's right to include it among scientific treatments.

In the excerpt, the contrast pair and the rhetoric about the feminist agenda present nursing science as an example of an arena in which the boundaries of science may get broken. They construct nursing science as a gendered discipline that may potentially break the rules of male science and give opportunities for feminist non-science to penetrate the male scientific community. The narrative is also a story about sceptics struggling against unscientific knowledge, and the article reflects the fears of the scepticism movement that these unscientific elements will spread into Finland through nursing science. The boundary-work situation described in detail produces boundary protection as a struggle between the female-dominated profession and male-dominated medicine, acting as a warning that unscientific actors do not lack means to spread their knowledge.

The notions in the medical journal article give some insight into the gender perspective in nursing science. They may exemplify medicine's control over nursing science by specifying unscientific knowledge and simultaneously silencing feminism themes. Thus the occasion may be an exemplary case of medicine exercising power over the closely related but less mature field of nursing science by undermining the feminist perspective, the personal characteristics of the therapist, and women's attempts to gain independence and improve their own working conditions. The question is therefore about what may and what may not be researched, together with how and how not to do research. On this occasion, therefore, medicine presents norms to nursing science research by controlling the themes, perspectives and emphases of research.

The sociologist Ann Oakley (1993, 44), who has analysed the interaction between doctors, nurses and patients, claims that the doctor-nurse-patient relationship mirrors that of the traditional nuclear family: the doctor represents the fatherly power to decide what constitutes really important work and how it should be done; nurses represent wives who are subordinate to fatherly power and who care devotedly for the children; patients represent the children who are taken care of and whose welfare is at the centre of the interaction. In the case of therapeutic touch, the excerpt from the medical specialists' article may represent a case of medicine exercising fatherly power over the younger nursing science, which is seen as subordinate to medical knowledge and its ways and traditions of research, and thus medicine stipulates norms for nursing science, just as it stipulates norms for the implementation of nursing care in clinical work and the organisation of nursing work in the hospitals.

These types of action have the potential consequence of making nursing science hesitant about choosing research themes from traditions of feminist and gender research, even though they might offer beneficial perspectives for a new discipline connected with a female-dominated profession. This was discussed in a series of discussion articles in the Finnish journal of nursing science, which pointed out the absence of feminism in Finnish nursing science in the early 2000s (Ryttyläinen 2003, Lahtinen and Heikkinen 2003, Lindholm 2004, Bislmi 2004). The female-dominance of nursing has been seen as influencing the ways in which nurses can develop their work and the degree of solidarity male decision-makers have with nurses (SSL 1979, 64). The female-dominated background of the

profession has also been seen as hampering the development of nursing science (Laiho 2005, 272–275). Thus the action of the medical specialists may be interpreted as an occasion on which the power of a more established field and negative attitudes toward gender-sensitive research have been utilised to limit the degree of freedom and independence of nursing science.

As a whole, the excerpts from the medical journal article renew and strengthen the boundary between medicine and belief medication, simultaneously distancing nursing science from medicine and scientific knowledge more generally. The final example, portraying an occasion that was a turning point in the reduction of the credibility of nursing science, suggests the precariousness of nursing science, such that non-science may penetrate the field in the disguised form of a feminist agenda, and may divert scientific research in order to break the norms of science and the boundaries between science and non-science. This generates an impression that the article is an expression of worry about the scientific status of nursing science.

It is characteristic of this form of boundary-work to demonstrate the incursion of the unscientific into nursing science. The *Sceptic* article, the university bulletin article and the medical journal article portray the routes through which unscientific knowledge may make incursions into nursing science: through literature, nursing models in healthcare education institutions, and the feminist agenda. These routes are demonstrated as having been used by unscientific knowledge, which is viewed as threatening the purity and credibility of the field of nursing science. Moreover, the routes are depicted as risking the credibility and unity of the scientific community more broadly. The boundaries between scientific and unscientific knowledge, between science and religion and between science and mystical beliefs are drawn.

Nursing science in boundary-work between science and other knowledge systems

Boundary-work between science and other knowledge systems in the conflict over therapeutic touch contrasts scientific and unscientific world views. It draws the boundaries of science with magic, religion, belief systems, New Ageism and feminism. It depicts scepticism and suspicion towards the unscientific. Boundary-work between science

and other knowledge systems discusses the routes by which unscientific knowledge can enter science. The boundary-work is dominated by the voices of sceptical actors linked with the scepticism movement. The nursing scholars present in the argumentative environment join this argumentation, but in addition they specify the characteristics of nursing science related to teaching at the polytechnic level and to practical nursing in hospitals and other caring contexts.

One way to characterise nursing science in the boundary-work between science and other knowledge systems is to view it as a competent protector of sceptics' scientific world view. These excerpts convince the reader of nursing science's ability to guard against unscientific knowledge. Nursing science is depicted as a full member of the scientific community, and the power of the discipline to guard against non-science is used to specify the differences between universities and other educational institutions, and between scientific knowledge and beliefs and religion.

Another characterisation views nursing science as a precarious discipline, the abilities of which to protect science against non-science are weak. Nursing science is presented as a passive discipline in need of outside support to stay in line with the correct scientific world view and to remain alert and critical. The boundary-work is done by addressing argumentation over products of the discipline in which unscientific material is discernible. Attention is given to the exceptional style of expression in such nursing science products, and the style is used as an indicator of unscientific knowledge, evoking suspicion about the abilities of nursing science to guard against non-science. The precariousness of the discipline is also emphasised by demonstrating the potentially contaminated models that may enter the field through healthcare education institutions and confuse the order of scientific knowledge production. The discipline of nursing science is thus presented in a dubious light. These views construct nursing science as a discipline that is unsure of its own status and in need of symbolic identifications, which generates the impression that the discipline is a route through which unscientific knowledge may enter the scientific domain.

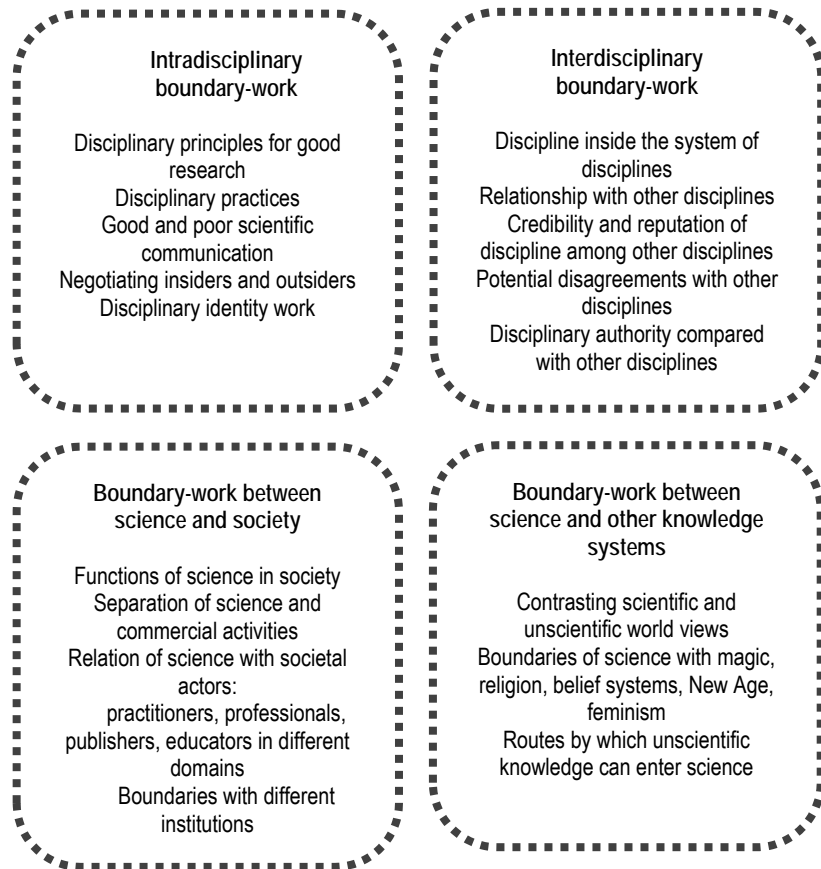
Nursing science is also given the qualities of inexperience, weakness in the face of unscientific attacks, and inadequate criticism of dubious knowledge. This argumentation evokes an impression that the actors are becoming disappointed with the ways in which nursing science participates in the scientific community's fight against non-

science, pseudoscience and unscientific knowledge. The feminist agenda is seen as a potential route by which unscientific knowledge might gain a foothold in nursing science. Nursing science is characterised as a young, inexperienced and female field with strong potential to become a breeding ground for unscientific knowledge.

The forms of boundary-work in the conflict over therapeutic touch

The forms of boundary-work in the conflict over therapeutic touch are summarised in figure 3. The figure illustrates the details of the forms of boundary-work that were activated in the argumentation in the conflict over therapeutic touch. The conflict over therapeutic touch gives analytical depth to the forms of boundary-work and strengthens the framework of the study, which is proposed as a framework for further studies of boundary-work. Moreover, it values the special characteristics of nursing science as a small, emerging, profession-oriented and female-dominated discipline.

Figure 3. The forms of boundary-work in the conflict over therapeutic touch



The intradisciplinary boundary-work in the conflict over therapeutic touch revealed manifold argumentation about disciplinary norms, principles and practices. The argumentation concerned theories and discussions of nursing science, and as such it differed from the argumentation in the conflict over fasting. The intradisciplinary boundary-work unveiled various social aspects within science, revealing the various existing understandings of good scientific communication and of the insiders and outsiders of the discipline. The conflict over therapeutic touch brought to light new aspects of intradisciplinary boundary-work and, unlike the conflict over fasting, started from the qualities of nursing science to produce understandings of the disciplinary community.

The interdisciplinary boundary-work located the less established discipline of nursing science inside the system of disciplines, and characterised it as an applied discipline, starting from its special characteristics as a profession-oriented discipline. As might be expected of a new discipline, interdisciplinary boundary-work revealed apprehensions about the reputation of nursing science in relation to other disciplines. In a similar vein, interdisciplinary boundary-work pointed out potential disagreements with other disciplines and compared the disciplinary authority of nursing science with that of other disciplines, thereby reflecting the struggle of a small and emerging discipline to find its place in the system of disciplines. However, one limitation of the argumentation was that it was dominated by nursing science's relationship with the stronger and more established discipline of medicine, and did not discuss its relationship with similar small, emerging, profession-oriented and female disciplines.

There was diverse argumentation in the boundary-work between science and society in the conflict over therapeutic touch. The functions of nursing science in society were discussed, broadly taking into account the manifold arenas and actors in which nursing science has an influence, and revealing more forms of boundary-work than in the conflict over fasting. The boundary-work between science and society separated nursing science from commercial activities and presented it as pure from commercial goals, which may reflect the background of the discipline in a profession that values benevolence and vocation rather than economic benefit. Boundary-work between science and society presented nursing science's relationships as complex, entailing interaction with a variety of societal actors such as practitioners in various professional domains, publishers, actors in the scepticism movement, students and educators at different levels of nursing education. It also made visible the boundaries of science with different institutions, and made visible the specifics of the educational path of nursing. However, even though the boundary-work between science and society revealed the various societal actors in nursing science, it did not reveal all aspects of the surrounding welfare occupations and professions.

Boundary-work between science and other knowledge systems was rich and varied. It generated an understanding of the emerging discipline as establishing its own credibility. It took into account the emerging discipline's victim position as regards the drawing of

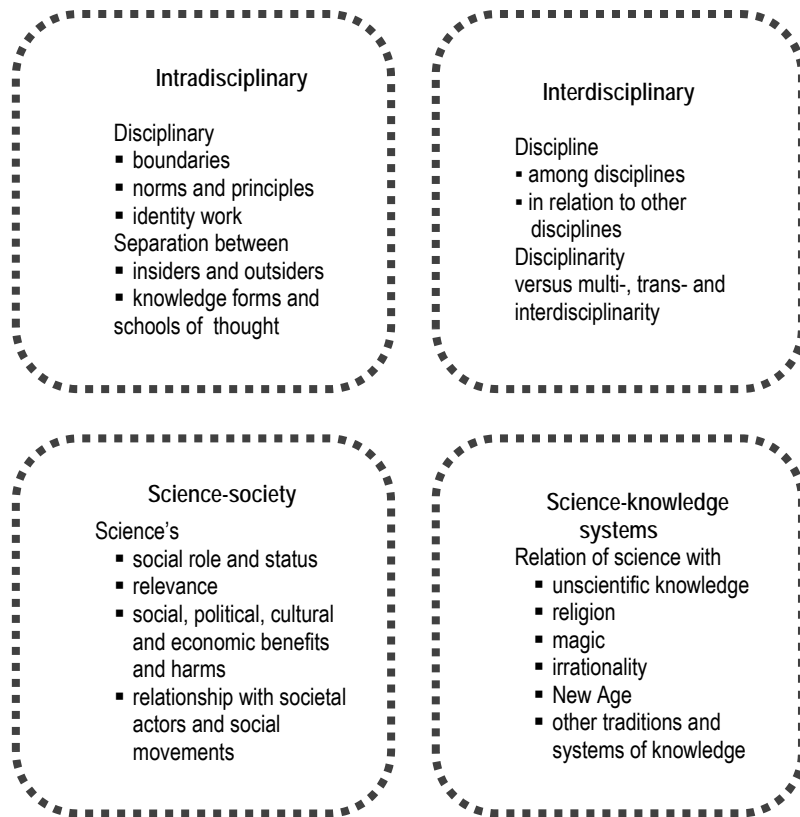
boundaries between science and magic, religion, belief systems, New Ageism and feminism, because it depicted scepticism and suspicion towards the ways in which the unscientific is rejected. The boundary-work between science and other knowledge systems understood nursing science as a young discipline and a potential new route for unscientific knowledge to enter science. The female characteristics of the discipline were activated in the very last excerpt, which reflected the manifold non-scientific movements that can enter science through disciplines that have a special background in this respect, such as nursing science's roots in the female-dominated occupation of nursing. However, the argumentation did not consider female dominance an asset, but instead one-sidedly presented this characteristic as a shortcoming of nursing science.

6. Conclusions

Contributions to boundary-work studies

This study has focused on forms of boundary-work in the case of nursing science. The concept of boundary-work was taken from Gieryn (1983, 1995 and 1999). On the basis of previous literature and my analysis of two conflicts in nursing science, I have developed a framework containing four forms of boundary-work which describes the range and variety of boundary-work at a general level. Figure 4 unites the forms of boundary-work found in the conflicts over fasting and therapeutic touch in Finnish nursing science at the University of Tampere. The figure was produced by merging figures 2 and 3. It proposes a framework for future studies on the forms of boundary-work.

Figure 4. The forms of boundary-work



The main contribution of my study is to identify and investigate different forms of boundary-work simultaneously, even within a single conflict. The framework is a contribution to boundary-work studies because it proposes a new way to address multiple boundaries and the simultaneity of boundary-crossings, an idea already proposed – but not sufficiently theorised or refined – by Klein (1996) and Nader (1996). My framework directs attention away from the question of why boundary-work occurs and onto that of the variety of boundary-work. It brings a new perspective to boundary-work studies by focusing less on the role of the actors in a conflict and more on the forms of boundary-work. Concentrating on the forms of boundary-work reduces the need to analyse the motives and intentions of the actors, which has often been the approach to controversies in science in the sociology of science, particularly in Gieryn's much-cited

research. The framework moderates the pressure to describe the actual twists and turns of the conflict, and instead focuses on how boundary-work is constructed and what forms it takes. As such, the proposed approach lays the groundwork for the development of boundary-work research theoretically. It is a methodical examination of how controversy, conflict and contradiction in science might be addressed in a new way.

The framework is based on earlier research on demarcation, controversy and conflict in science. The idea adopted by my study, that science is disharmonious, that conflicts frequently occur in science and that science is social and culturally contentious, is not new. The intradisciplinary, interdisciplinary, science-society and science-knowledge systems forms of boundary-work have already been discussed separately in relation to different cases in many previous studies. To mention just one example for each form of boundary-work, Pera (2000) discusses factors in intrascientific debates, Friman (2010) theorises interdisciplinary boundary-work, Tuunainen (2005b) analyses boundary-work between science and society, and Nader (1996) focuses on boundary-work between Western science and other knowledge systems.

Gieryn's 1999 book *Cultural Boundaries of Science* also studies different, separate cases. Although he does not classify or fully explicate the different forms of boundary-work, or try to identify the different forms in each case, Gieryn does discuss them. In the case of John Tyndall's separation between science, religion and mechanics, Gieryn highlights the boundary-work between science and society – particularly in the engineering profession's relationship with science – and the between science and other knowledge systems, especially the separation of science from Christian churches. In the case of the National Science Foundation and Congress resolutions, he analyses interdisciplinary boundary-work, specifically the separation of the natural from the social sciences. He analyses the boundary-work between science and other knowledge systems in the debates between phrenologists and anatomists, pointing out the separation of science from religion and lay knowledge. The same form of boundary-work is the focus of his discussion of agriculture and compost waste. In the case of cold fusion, he discusses boundary-work between science and society, especially the power of the media and politics to define the validity of scientific facts.

Intradisciplinary boundary-work is not presented in Gieryn's analyses, but it has been well covered in other research. For example, unlike Gieryn, Taylor (1996) finds this form of boundary-work in the case of cold fusion, where he analyses the situational definition of Mertonian norms. However, previous research has often seen intradisciplinary boundary-work as a discipline's internal business; Lyne and Howe (1990) present a prime example of this. In their work even interdisciplinary boundary-work and boundary-work between science and society (what they call extradisciplinary discourse) are looked at from the perspective of the expert – the scientist – alone.

My analysis shows that multiple actors may use power in a conflict situation to define the disciplinary norms or principles of good scientific communication or even disciplinary identity. This type of approach was proposed in the book *Defining Science* (1996) by Charles Alan Taylor. He focused on science as a part of broader social and cultural practices, and he emphasised that actors other than the representatives of science are also able to define the contents and characteristics of science. Rather than attributing most of the power to define science to the discipline itself, Taylor's approach is more inclusive, but unfortunately his analysis is limited to two much-studied controversies in the natural sciences (the cases of creationism versus evolutionism and cold fusion), and the theoretical development is incomplete. My study completes his idea and proposes a theoretical framework that pays heed to all voices in boundary-work by directing attention to the forms of boundary-work. My analysis does not overemphasise the discipline's own boundary-work, but also listens to other actors with a stake in the conflicts. In this way I am able to uncover the rich variety of boundary-work.

My study highlights how the forms of boundary-work are rhetorically constructed. It reveals that the forms are emphasised in different ways in the conflicts, but nevertheless the forms seem to be sufficiently strong and diverse to be found in both conflicts. The forms vary between the two conflicts to some extent. One reason for this is that the conflicts were quite different. The conflict over fasting involved forms of boundary-work articulated especially by actors outside nursing science. The conflict over therapeutic touch involved forms articulated by the nursing scholars themselves, and by different actors surrounding the discipline as such. The conflicts also to different extent reflect discussions of different disciplines. The conflict over fasting reflects many discussions about the discipline of medicine

and mirrors, for instance, the boundary-work in medicine between complementary or alternative treatments and the practices of medical work by doctors. The conflict over therapeutic touch to a greater extent is located inside nursing science, and its boundary-work was apparent when the establishment of the relations of different schools of thought and of the credibility of nursing science was central.

One practical option for future usage of my theoretical framework is to use it to introduce students to controversy, conflict and demarcation perspectives in science and technology studies. It is suitable for the description of a single conflict, or of several conflicts at once. With this framework one can teach and demonstrate different controversies and conflicts, and illustrate the boundaries worked on in science as well as different aspects of conflicts in science.

Nursing science and the vulnerability of academic status

This study highlights the diversity of ways in which nursing science is characterised in the two conflicts. The conflict over fasting shows that the qualities of nursing science can be formulated by bypassing the definitions and traditions of nursing science itself. Thus nursing science is made invisible, and other disciplines and knowledge systems provide the characterisations of nursing science. However, the conflict over fasting does not only bypass nursing science; there are also many contradictory characterisations concerning nursing science in this conflict. The conflict over therapeutic touch, on the other hand, reveals a richer picture of nursing science and gives more emphasis to its starting points as a small, emerging, profession-oriented and female-dominated discipline. The conflict over therapeutic touch highlights a diverse field of nursing science, in which the discipline and its status are interpreted in manifold ways even within the discipline itself. The discipline appears to be internally tense and rich in formulations about itself.

In this context the academic status of the then small and emerging female-dominated field with professional bonds seems vulnerable. This is shown multidimensionally in the forms of boundary-work. In intradisciplinary boundary-work in the conflicts over fasting and therapeutic touch, the vulnerability of nursing science's academic

status is evident in that the discipline needs to be legitimated as unambiguously strong, precise and scientific. Thus in conflict situations the scientific nature of the discipline has to be articulated especially strongly in order to support its academic status. This finding is in line with work on disciplines similar to nursing science. Becher (1989, 140) states that disciplines created by the academisation of professions – through the route of professionalisation – are forced to present themselves as ‘academically acceptable’. Such argumentation had to be used in the conflicts studied in this thesis, because nursing science was accused of being unscientific. Also, the community of nursing scholars had to be presented as unified, restricted and closed, because an admission that the discipline was a conglomerate of various perspectives, starting points, views and perceptions – an idea proposed by the professor emerita – would have undermined its status as a protector of the traditional academic values of unity and the privileged position of scholars to define the boundaries of science.

In interdisciplinary boundary-work, nursing science is depicted as in need of other disciplines’ protection. This is evident in that nursing science is expected to follow the rules and boundaries of medicine. Nursing science is also depicted as a newcomer discipline that needs perspectives from other disciplines. In a similar vein, in her study on nursing science in the Nordic countries, Laiho (2005, 268) uses the expression ‘Big Brother’ to describe medicine’s relationship with nursing science. In interdisciplinary boundary-work, nursing science appears as a ‘little sister’ in need of protection and guidance, an unstable newcomer in need of acceptance from other disciplines, and consequently as a discipline that is subordinate to medicine. This argumentation adds to the impression of the vulnerability of nursing science’s academic status.

Furthermore, in the boundary-work between science and society, the societal impact of nursing science is presented as broad and significant in order to justify its position. This lies behind the presentation of the discipline as an initiator of social change, the impact of which extends to healthcare practices, students’ world views, and nurses’ societal status. Nursing science is regarded as efficient to the extent that it changes caring culture, controls commercial activities within healthcare education, and wins the struggle against unscientific knowledge. Although disciplines such as nursing science do all have a practical orientation, the societal impact of nursing science is emphasised unusually strongly for the time – i.e.

the mid-1990s, before discussions of mode 2 (Gibbons et al. 1994) or academic capitalism (Slaughter and Leslie 1997) argue that societal impact became increasingly important for all disciplines. I therefore interpret this presentation of nursing science's societal impact as evidence of a need to emphasize it so as to increase the discipline's academic status; this generates as a counter-effect the impression that there is a fear of being 'invisible', as Meerabeau (2005) describes nursing science. This adds to the impression of the vulnerability of nursing science's academic status.

In boundary-work between science and other knowledge systems, nursing science is presented as unscientific, and is depicted as a route through which unscientific knowledge may enter science. The argumentation associates nursing science with knowledge systems other than the scientific, in the same category as religion, cultural beliefs and humbug. The consequences match Nader's (1996, xiv) account of the fate of non-Western knowledge systems: they are forced outside the rational, universal and intellectually superior Western knowledge system, marginalised as outlaws. In the case of nursing science, this marginalisation took place in public, in the context of the conflicts over fasting and therapeutic touch, this argumentation forced nursing science on the defensive side and made it appear vulnerable.

Another contributor to the vulnerability of its academic status is the malleability of nursing science's characterisations. In the forms of boundary-work, the characterisations of nursing science reveal a simultaneity of opposites, and this is typical of conflict situations in many organisational contexts (Putnam 2001, 11). Each form of boundary-work contains both negative and positive connotations. Thus in intradisciplinary boundary-work nursing science is not entirely strong or independent, but is also unsteady and uncertain. In interdisciplinary boundary-work it is depicted both as a mere subordinate to medicine and as independent in its disciplinary relationships. Boundary-work between science and society portrays nursing science as a strong player in society with strong means to affect the healthcare system and education, but the counter-argumentation claims that the discipline is invisible. In boundary-work between science and other knowledge systems, nursing science is seen as a dubious field on a par with unscientific knowledge, but it is also depicted as an able protector of the purity of science.

I see this simultaneity of opposites as a rhetorical strategy relating to the actors' needs in a difficult conflict situation to strike a balance between avoiding shame, constructing credibility, protecting autonomy and pursuing reputation (Gieryn 1999). This has been highlighted by Judy Segal (1995, 111), who has analysed nursing science's rhetoric in scientific articles; she argues that 'nursing rhetoric is far from being unitary.' This is in line with Findlow (2012, 119), who emphasises the ambiguity of nursing science's academic status in the individual conversations and written commentaries she collected from nurse lecturers. Regardless of the motive in individuals' heads and their consequent choices of rhetorical strategy, the simultaneity of opposites reveals nursing science as an academic discipline under the pressure of different intersecting expectations and tensions from different parties – and of vulnerable status.

The vulnerability of academic status found in this study applies particularly in conflict situations, but it may also reflect other activities of nursing science. There is a danger that in difficult situations nursing science will take a defensive position, and that in the attempt to avoid conflict, certain issues may be concealed or silenced. I see this kind of defence as emphasising and deepening nursing science's vulnerable position, increasing its marginalisation from the centres of the academy. The manifold discussion required of a new academic discipline can also be turned into a strength and an opportunity to obtain a good reputation as a domain for lively discussion. Moreover, nursing science has not yet diverged from practical and traditional knowledge and cultural beliefs in the way that more established disciplines have done. Thus it has direct connections with socio-cultural actors, and better opportunities than more established disciplines to develop a lively culture of discussion and an open way of drawing the boundaries of science. If conflicts are accepted as fundamental aspects of organisational life, nursing science's lively discussion of the boundaries of science might win it a reputation as a resolver of conflicts.

The situational expressions in the conflicts cannot be interpreted as giving a complete picture of nursing science. One reason for this is that not all the actors in a discipline participate in conflicts. Tuomi (1997) tried to cover discussions by the early developers of nursing science, but also faced the limitation that this kind of analysis can only mention the best-known early professors and must leave aside all the other actors. My approach differs greatly from research that aims to

characterise the whole discipline through the analysis of, for example, dissertations in the field (Heyman 1995) or the history of the discipline (Laiho 2005). Instead my study offers a rich interpretation of the discipline in conflict situations.

My study highlights the crucial relationship between nursing science and medicine. Medicine appears as a supporter, a companion and an opponent. Medicine acts as means of separation, which is a ground for building a stronger identity for nursing science. It is also a source of togetherness in the academic community. Shared goals of patient welfare are generated with medicine. From a position of stronger epistemic authority, medicine acts as an opponent, critiquing and creating tensions if nursing science attempts to diverge from the hegemonic path. Thus medicine simultaneously weakens and strengthens the discipline of nursing science. It acts as a friend and an enemy at the same time.

The relationship between nursing science and medicine is asymmetrical in that medicine is an established discipline with a long history. Medicine also does not share the characteristics that make nursing science's academic status vulnerable: female dominance and a connection with a multilayered professional field. It is surprising that nursing science does not seem to have had a strategic academic ally in the conflicts that was its equal; perhaps it was only just developing such alliances at the time of the conflicts. Nursing science thus stands alone in the conflicts, with no backing from other similar disciplines. It might also be the case that the analysis did not extend to such potential relationships, for example with the discipline of social work, which shares nursing science's commitment to the welfare state. This might reflect the sometimes strong divide between social care and healthcare within the welfare society.

The conflicts over fasting and therapeutic touch contain surprisingly little boundary-work about knowledge based on the experience of women as caregivers and women's traditional forms of knowledge. The fragmentary notions provided by the text by the medical specialists in the conflict over therapeutic touch give some insight into the gender perspective in nursing science. They also give some clues about how female dominance is perceived by different actors in conflicts in science. However, this is one area that further research could focus on. How is the female dominance of certain fields renewed in workplaces, education institutions and universities, and what are the consequences of the female dominance of certain

fields for the development of the credibility of those fields? This might be approached by looking at a discipline that does not have the same kind of professional background as nursing science. One option would be to scrutinise the field of women's studies or gender studies, which specialises in taking the views of women into account and values its own female dominance at the outset. Its boundary-work and the qualities attributed to it in scientific conflicts might provide more understanding of female-dominated fields and their academic status.

One open issue is the effects of the profound changes in the university sector in Finland and elsewhere in Europe on vulnerable disciplines such as nursing science. As I was completing this study, the University of Tampere reorganised its structure from more than 30 discipline-based departments into nine schools. Each school has a single budget, and individual disciplines no longer have separate mechanisms to control their own budgets. Thus monetary issues are negotiated at the level of the school and not of individual departments. In this reorganisation nursing science merged into a department with another discipline, public health, now forming the school of health sciences. Part of the nursing science study programme was united with that of public health into a new Bachelors programme in health sciences. Nursing science has to adapt to a new situation in which its independence is to be negotiated with public health rather than with medical science, with which it was coupled prior to the reorganisation. In terms of research this means that nursing science forms one research group alongside eight public-health research groups. It will be seen in the future how the academic status of nursing science develops, how it maintains its quality of research, and how the identity of nursing science evolves in the new organisation.

The forms of boundary-work in nursing science reveal different actors' expectations of nursing science. According to the conflicts over fasting and therapeutic touch, nursing science as a cradle of knowledge production is expected to be beneficial for a variety of actors. This study concretises the actors from different social worlds who have contradictory expectations about what nursing science should include and how it should change the circumstances and problematic situations of their groups. Some of these actors have already been pointed out by previous research. Nieminen (2008, 138) carefully teases out nurses' different expectations of nursing science, including 'recognition for nurses in terms of staffing and pay, gaining

an independent domain for nurses in health care, employee autonomy, practice development and professional progress'. Findlow (2012, 124–125) highlights that students of nursing expect to acquire skills to help them in practical work with patients and other aspects of immediate practical utility which they will be able to use in their everyday work.

My study also highlights other groups that have expectations of nursing science. Other disciplines in the university system expect nursing science to line up with their principles of good research, and to demarcate the unscientific from science. Medical specialists expect nursing science to help medicine to draw the boundary between science and non-science, and to restrict the treatments used in healthcare to those justified by scientific research. Sceptics expect nursing science to join the scientific world view. Alternative treatment activists expect nursing science to act for the inclusion of such treatments in official healthcare practices. These groups represent both the academic context and the broader culture. My analysis thus accentuates the academic interactions of Finnish nursing science in its broad cultural setting.

My analysis shows that the actors in different social worlds may have 'potentially conflicting sets of concerns' (Star and Griesemer 1989, 413) about, for example, the distribution of responsibility in healthcare, the protection of the boundaries between science and unscientific knowledge, or the generation of credibility for alternative treatments. The challenge for nursing science is that nursing scholars also need to manage their own simultaneous multiple memberships of these social worlds, whether as nursing scholars, nurses, teachers, or the chief nursing officer of a regional hospital. This means that individual nursing scholars might approach a conflict from very different starting points, because of their involvements in different spheres of nursing. This reflects different levels of commitment to the academic community of nursing science. Some nursing scholars have a strong commitment to the academic context, whereas for others their academic identity may be outweighed by the commitment to nursing work, or teaching, or managing other nurses. Thus protecting the authority of academic nursing science is less important to some than to others.

From a sociology of science point of view, it is important to study conflicts in order to understand disciplines such as nursing science, and this study adds relevant knowledge to that domain. However, an analysis that takes the discipline apart and places it at the intersections

of medical knowledge, alternative knowledge and traditional knowledge may not be easily recognisable or even identifiable by nursing scholars themselves. Instead they might find it annoying to focus on issues that they would rather forget, in both the academic and the professional domains. My study may be seen as a threat to the discipline, or an attempt to criticise or belittle it. The research on the conflicts might be interpreted as an attempt to engage in and continue old controversies by taking certain positions in relation to their discussion. Nevertheless, the analysis of the conflicts is important for the discussion of silenced themes in nursing science and the unveiling of the roots of the discipline in the nursing profession.

My study generates grounds for self-reflection on nursing science by nursing scholars, educators, administrators and nurse practitioners at all levels of nursing. The academic status of nursing science has long been an interest of the Finnish Nurses' Association, which has influenced and supported the university education of nurses, which is seen as potentially raising the status of nursing practice. The Association and its nurse practitioners will find in this research reflections on the academic education of nurses, and interpretations of the field of nursing science by the manifold actors who spoke during the two conflicts. For students of nursing and nursing science, the study reveals understandings of the field that are important for those who are studying to become nursing scholars. The conflicts belong to the past of nursing science, and were important turning points in the educational paths of many nursing science students. My study paves the way for discussions about the status and characteristics of nursing science, regarding these specific conflict situations and also more generally.

My study is based on the gaze of a sociologist with a personal familiarity with nursing science. My position as an outsider with inside experiences as a student enabled me to identify and analyse the conflicts. I have acted as a door opener who knows where to look for the light switch so as to see even more clearly what happens inside. I hope I have opened the door and lit the room in a way that enriches the self-knowledge of nursing scholars.

Implications for methodology and limitations of the study

This study has centred on the rhetoric of boundary-work, and has therefore used expressions such as argumentation, rhetoric and rhetorical means. It has concentrated on the qualities and characterisations associated with nursing science and the portrayals of its academic status that were used in boundary-work. In this way, the study joins the tradition of studies that take science and scientific knowledge to be socially constructed phenomena discursively produced in specific sociohistorical contexts (Fahnestock 2009, Segal 2009). For the rhetoric of science tradition, the nursing science conflicts provide a fresh context for the application and development of methods that uncover the rhetorical tools of persuasion.

The method of analysis makes visible the simultaneity of different, even opposing qualities attributed to science in a conflict, a notion already highlighted by Gieryn (1983, 792, 1999, 29). It considers the multitude of divergent and conflicting expressions with which the scholars involved in the conflicts speak of science (Gilbert and Mulkey 1984, 2). Moreover, the analysis highlights that several actors who may not have had a formal position in science nonetheless participated in the meaning-making process of the two conflicts (Taylor 1996, 15). The breadth of the social network defining nursing science may be characteristic of a profession-oriented discipline which, in addition to interaction with society more broadly, also interacts with the profession. The profession has reasons to want to mould the impression that is given of nursing science. Nursing academics might even have too many voices to listen to, too little time to concentrate on academic self-definition, and too many simultaneous interpretations of their discipline to contend with. This might be a problem of emerging disciplines rather than established ones. Established fields such as psychology and medical science may not have such immediate need to take into account their background professional domains in conflicts.

The rhetorical approach has provided a way to analyse the ways in which the characteristics of nursing science and its boundaries are formulated in argumentation, but the rhetorical approach has also revealed boundary-work as an identity project, as noted by Roberts and Good (1993, 12). For example, the analysis showed identity work in nursing science to be a part of intradisciplinary boundary-work. The

conflicts over theses seem to be part of the process of the socialisation of nursing science, in which traditions of nursing science boundary-work are established and certain aspects are excluded from its sphere. The conflicts create the rules of propriety for students and the discipline as a whole. At the same time, the discipline is presented as able to reject non-science. Togetherness with the academic community is also generated in the conflicts.

The research setting was designed to find a variety of boundary-work. An abundance of boundary-work was successfully found in the small, emerging, profession-oriented and female-dominated discipline of nursing science. The composition of the study focused on two conflicts over theses, the conflict over fasting and that over therapeutic touch. The first research question, which sought to find the forms of boundary-work, would perhaps have required only one rich conflict. For the purposes of strengthening the framework for the analysis of forms of boundary-work, the choice of two conflicts broadened the scope of discussion. Keeping the conflicts separate did justice to the context of Finnish nursing science. It highlighted the intertwining of social, historical, political and cultural aspects in the conflict rhetoric. This decision enabled analytical depth to emerge in this study, which was done by iteratively considering the rhetorical tools and the context and vice versa. It was also considered that the legibility of the study would be enhanced by separating the two conflicts. One option for future studies using the forms-of-boundary-work approach would be to analyse the four forms of boundary-work in several conflicts from different disciplines. The analytical depth adopted in this study, however, would then need to be brought to a different level, and the second research question would have to be left aside.

The conflicts concerned boundary-work in thesis examination processes. As such they are close to 'routine boundary-work' (Mellor 2003, 521), in which it has been suggested that several boundaries are worked on at once. Thesis conflicts typically evaluate whether the thesis in question belongs to science and to which discipline it is attached, and as such they are 'ongoing day-to-day' disciplinary 'maintenance work' (Mellor 2003, 521). These types of conflict focus on the quality of science by rating the thesis and deciding whether it is in line with the good practices of scientific conduct. They sometimes also contain elements of boundary-work from other disciplines, as with the boundary-work from the discipline of medicine between

complementary and alternative medicine and the medical profession in the conflicts within nursing science. However, thesis conflicts also contain open debate and comparisons, and the boundaries of science are negotiated in ways that are characteristic of exceptional rather than routine situations of controversy. The thesis conflicts over fasting and therapeutic touch grew out of the examination context of the theses and became contexts for exceptionally strong argumentation, in which there were varied forms of boundary-work and manifold qualities associated with nursing science.

The application of the framework to much-studied open and public controversy situations and to different disciplines will be a task for further enquiry. For example, research could be conducted on whether forms of boundary-work appear in the much-studied controversy over sociobiology (Caplan 1978, Kitcher 1985, Lyne and Howe 1990, Jeliazkova 1993, Segerstråle 2000a, Ceccarelli 2001, Ylikoski and Kokkonen 2009, 45–54). It would be interesting to analyse how the forms-of-boundary-work approach would change perceptions of conflicts that have been extensively studied previously, and whether the approach would renew the interpretation of such conflicts.

My analysis concentrates on boundary-making in different texts, rather than on the linear model in which the beginning, the middle and the resolution of the conflict are in focus (Hacking 2000, 214). My framework values the notion that not all forms of boundary-work are equally evident, and my study digs into ‘the deep and silenced contradictions’ (Hacking 2000, 213, 229) within the conflict. For example, in the fasting case the boundaries between scientific knowledge and other knowledge systems were barely to be seen. They were addressed almost entirely by presenting quotations from the thesis on fasting. Looking at the linear development of the conflict would have missed these hidden ways of doing boundary-work. In a study that aims to address the different forms of boundary-work there is a need to look for the more minor expressions that establish and maintain the boundaries of science.

This study has touched upon the scepticism movement. The actors of the scepticism movement appear to have a strong voice in boundary-work between science and other knowledge systems. In this form of boundary-work, nursing science becomes an assistant to the project of scepticism, particularly as it aims to reject complementary and alternative treatments from evidence-based medicine. Forstorp

(2005, 17) characterises the scepticism movement as ‘science patrolling’, ‘knowledge policing’ and ‘epistemological cleansing’. His research is pioneering in its analysis of the scepticism movement. My analysis unveils the rhetoric of scepticism and its missionary statements for removing unscientific knowledge from nursing science. This scepticist project overpowers the rhetorical strategies of nursing science to establish differences between unscientific and scientific knowledge, and makes nursing science appear to be an assistant science whose knowledge strategies are weak and easily challenged.

It would be important to further study the scepticism movement’s relationship with different disciplines, because the movement is a powerful force that makes definitions of science, wields a certain power of invalidation, and consequently has an influence on perceptions of different disciplines. The actors participating in the conflicts over fasting and therapeutic touch had backgrounds in strong and established disciplines, which raises the question of the disciplinary backgrounds of the sceptics. This might have an effect on how they perceive and understand emerging profession-oriented disciplines such as nursing science and their way of drawing boundaries. Also, the gender balance of sceptics might influence the issues that are raised in the movement and the development of their relationship with female-dominated disciplines.

The role of different audiences has not been discussed in this study. It did not fall within the scope of the research questions. Future studies might seek to analyse the role of different audiences in the conflicts over fasting and therapeutic touch, and how the different forums of argumentation might have shaped the arguments used, as for example Ceccarelli (2001) shows in her study. For example, the medical journal article on the conflict over therapeutic touch was targeted at multiple audiences. An analysis of the role of the audience might shed more light on the elements that were used to illustrate the shortcomings of therapeutic touch for the readership of the journal.

The notion of power in my study concentrates on rhetorical power: the power to draw boundaries in texts, and to characterise nursing science. Other forms of power, such as that held by the writer of the text or the power of resource allocation, are not discussed. Although the study highlights the different voices involved in boundary-work, the analysis nevertheless suggests that it is the power connected with expertise that is used most actively. The preliminary examiners use their power as prominent representatives of an established field as

evaluators of the thesis. The professor of nursing science uses the symbolic power connected with the prestige of professorship to overpower other voices in the conflict. One power of expertise is to stay silent, and this is also exercised in conflicts that fade away fairly quickly after a few commentaries and expert opinions. The power of expertise often comes with verbal skills or knowledge about the technicalities of scientific reasoning, which might be one reason why, for example, patients did not raise their voices in the conflicts.

The characterisations and status of nursing science based on the texts in the two conflicts act as a preliminary viewpoint on the tradition of academic nursing science and the wealth of research and teaching in this area, which has already become considerable during its first 30 years. The viewpoint is most effective in relation to the characteristics attributed to nursing science and the understandings of the academic status of this emerging discipline that were activated locally in conflicts in the mid-1990s at the University of Tampere in Finland. In the situation of the conflicts, these expressions created impressions, shaped views and generated associations. My research for its part also gives a picture of nursing science and its boundary-work. Similar conflicts might emerge again, and the qualities and status claims found in this research might be activated again. The qualities of nursing science found in this research may still be alive today, and might be reshaped in another conflict.

The research has concentrated on nursing science and its boundary-work. Therefore it portrays the wider environment of nursing science only partially. One aspect of that environment that frequently appears is that of the teaching of nursing, and the connections between nursing science and the teaching of nursing at different levels. The problematic of the long educational path in nursing science becomes visible in the conflicts. Another part of the environment, nursing work, is much more multilayered than can be grasped from expressions centring on nursing science and its characteristics. The analysis does not reveal the specialist areas of nursing, such as midwifery, health visiting or practical nursing. These appear in the argumentation as an undifferentiated lump called simply nursing. Neither are the levels of administration or the different contexts of nursing, such as retirement homes, health centres or highly specialised hospitals, shown. The context of nursing is thus made quite uniform and limited. My research opens up the status of nursing

science in relation to these varied contexts, and is thus not focused on the practical nursing domain.

The picture of medicine, a third aspect of the environment, is also restricted. It does not reveal the details of this closely related and also profession-oriented discipline, but presents it as limited to the viewpoint of sceptic medical scientists and academic biomedicalists. The richness of academic specialisations and professional links is not fully considered. My research opens up this context to some extent, but still leaves many questions. For example, perhaps there are some medical specialisations, such as psychiatry, that would be more open to multidisciplinary collaboration than others. It is also possible that areas might be found where mutual respect between medical science and nursing science would be possible and more empowering than in the conflicts over fasting and therapeutic touch.

Another domain that is not included is trade union activism, which has been a powerful force behind nursing science in all the Nordic countries (Laiho 2005, 261). This might be because the nursing profession was not under threat in these conflicts; the conflicts concerned the credibility of nursing as an academic discipline, and its theses were tested against the principles of good research. If the conflicts had led to radical changes in the status of the discipline, trade union activism might have come up. A starting point in these types of conflict might be the case of University of Helsinki, where teaching in nursing science was closed down after only just over 10 years, in spite of the fact that the nurses' trade union had donated a professorship in nursing science.

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Appendix: The rhetorical tools of persuasion

In my analysis I have sought four rhetorical tools concerning the presenter of the argument that increase trust in the presenter and distance their own interests from the argument.⁵¹ The first of these is **nominalisation**, which aims to hide the author in the text (Fairclough 2003, 12, 144). This is done by raising the level of generalisation so that the author becomes distanced from the argument. The writer might start a sentence with the expression ‘It is clear that...’, without specifying to whom it is clear. By using the passive the author aims to persuade the reader of their disinterestedness and of the generality of the understanding in the argument presented (Jokinen 1999b, 133–135, Aro 1999, 26). The passive is often used for the purposes of downplaying the role of human factors, especially in scientific texts (Fahnestock 1997, 60, Simons 1993, 154)

The second is **category entitlement**, which assumes that certain rights to know belong self-evidently to certain categories (Fairclough 2003, Potter 1996, 114, 133, Jokinen 1999b, 135–136). Category entitlement also constructs hierarchies of expertise (Aro 1999, 27). The writer might use a category familiar from knowledge production (professor, lecturer, scholar, scientist) to persuade the reader of the correctness of the argument. For example, this might be done by arguing that ‘as a professor of medicine I am convinced that...’, where the professorship is used as a non-negotiable category whose arguments are to be generally considered true. The category of professor is referred to as if it was more powerful than that of student or general reader. The writer might also say that ‘without being a specialist in nursing science myself, I argue that...’, disconnecting the writer from the category of nursing scholars in order to reassure the reader that the writer is a neutral outsider who is giving a neutral account of the discipline.

A third rhetorical tool to distance the interests of the author from the argumentation is **alignment** or **footing**, which means that the author binds themselves to the argument in different ways (Potter 1996, 142–149, Jokinen 1999b, 136–138). The argumentation takes a different footing if the argument is presented as one’s own or as used by someone else. For example, if the author writes that ‘this professor

⁵¹ The categorisation of rhetorical tools concerning the presenter of the argument and tools concerning the argument itself has been taken from Jokinen (1999b). Her article has also been an important source of further references.

of nursing science wrote such-and-such, because she feared critique...?', this is on a different footing from 'a student claimed that this professor of nursing science wrote such-and-such, because she feared critique...'. In the first sentence, the author is bound to the account of the professor of nursing science because it treats it as an explanation, whereas the second sentence is merely passing on what the student has claimed, and the author is not committing herself to the claim.

A fourth rhetorical tool to distance the interests of the author is to strengthen the argument with **consensus**, which generates an impression that the argument is a fact that is widely agreed on by several other parties and authorities (Potter 1996, 158–162, Jokinen 1999b, 138–139). The writer might use direct or indirect quotations from other texts in order to imply that there is common understanding about the argument which supports the writer's own argumentation (Fairclough 2003, 49). The writer might use impersonal authorities, such as 'nursing science' and 'the Bible'; categories of actors, such as 'physicians' or 'professors'; or personalised authorities referred to by name, such as 'Parse (1995)' or 'Professor Paunonen' (Perelman and Olbrechts-Tyteca 1971, 307). A typical practice of scientific texts is to refer to previous texts which are brought in to support one's own argumentation and as a guard against attacks from behind (Latour 1987, 33, Luostarinen and Väliverronen 1991, 89, Jokinen 1999b, 138, Kakkuri-Knuuttila and Heinlahti 2006, 52–53). One form of this type of assurance technique is to use 'we' or 'they' as the subject of the text in order to indicate that the writer is not alone in presenting the argument (Luostarinen and Väliverronen 1991, 87–88, Jokinen 1993, 223–224, Jokinen 1999b, 139). In the phrase 'it is unfortunate that our good ambitions...', the use of the pronoun 'our' indicates that the writer is speaking in the name of a larger group of people. It suggests that there is strong support from other parties, and that the argument is anchored in arguments by other persons and institutions.

While analysing the research material I have also searched for rhetorical tools that have to do with the argument itself. The rhetorical tools of **factualisation** aim to generate an impression that the arguments presented are facts independent of the writer and her interpretation (Potter 1996, 150–158, Jokinen 1999b, 140–141). The facts might also be presented in such a way that no alternative interpretations are available or that the alternative interpretations are silenced, for example by using expressions such as in the sentence 'this

treatment must be considered valuable.’ This objectifies the issues at hand and diminishes the personal agency of the author in order to generate an impression that alternative thinking is unnecessary (Wooffitt 1992, 102, Aro 1999, 26, Jokinen 1999b, 141). Scientific articles and other scientific texts often use an empiricist repertoire characterised by an impersonal style and neutral positioning which leave no space for doubt, alternatives, incongruences or personal insights (Gilbert and Mulkay 1980, Gilbert and Mulkay 1984, 55–57, Woolgar 1988, 75).

The writer might also reassure the reader about the arguments used by **producing categories**, or placing something within a general category (Billig 1987, 121).⁵² This means attributing certain characteristics – and not others – to certain things (Potter 1996, 111, 177, Bowker and Star 1999, Jokinen, Juhila and Suoninen 2012, 18). Categorisations such as ‘New Age’ or ‘humbug’ use symbolic power to criticise certain issues, to justify arguments or to produce stereotypes (Luostarinen and Väliverronen 1991, 70, Billig 1987, 126). In scientific texts categories are used to generate credibility for the theories, arguments or analysis presented (Jokinen 1999b, 144).

The writer might persuade the reader with **detailed descriptions**, such as after a sentence starting ‘I myself have personally got into a situation where...’, which aim to produce an authentic relation of the writer to the facts produced (Jokinen 1999b, 144–145, Potter 1996, 117–118, 162–166). Such narratives generate an effect of the truthfulness of the writer and direct attention away from any weaknesses in the argumentation (Potter 1996, 162–166).⁵³

The use of **quantification** and quantifying expressions such as ‘several’ or ‘many’ is also typical when a writer is aiming to produce the impression of uncontradicted knowledge or facts (Jokinen 1999b, 146–148). With enumeration the writer implies that there is a series of issues or a great quantity of things (Fahnestock 1997, 63). Quantification may lead the reader to assume that ‘one thing is better than another for quantitative reasons’ (Perelman and Olbrechts-Tyteca 1971, 85). One form of quantification is the use of **extreme expressions** such as ‘in the whole world’ or ‘never’ to present the issue as an indisputable truth, maximise or minimise certain

⁵² Douglas (1966) is a classical analysis of the cultural categorisations of pollution and taboo.

⁵³ Aro (1999, 30–39) studies the narratives of sociology. In contrast with my study, however, he analyses meta-narratives, whereas I study narratives at the microlevel of texts.

characteristics or generate the impression that the issue is a regular one. Extreme expressions normalise the situation at hand (Pomerantz 1986, Wooffitt 1992, 81, Potter 1996, 187–194, Jokinen 1999b, 150–152).

Metaphors activate certain meaning potentials, revealing new aspects and connotations (Luostarinen and Väliverronen 1991, 56–57, Perelman 1996, 135–141, Kakkuri-Knuuttila 1998, 258–260, Jokinen 1999b, 148–150). A metaphor carries with it a set of commonplaces that come to mind when it is used (Ceccarelli 2004, 94). Metaphorical language and figurative speech are also a characteristic of scientific texts (Keller 1995b, Aro 1999, 40–46, Ceccarelli 2001, 129–133, Baake 2003, Brown 2003, Fahnestock 2009, 180–181).⁵⁴ For example, the use of the term ‘foundation stone’ in relation to the theoretical framework of research gives connotations of construction work with a solid cornerstone, or the term ‘soup’ used to describe the theoretical underpinnings of a book gives the impression of a concoction that is mixed together from haphazard ingredients.

The writer might use **lists** (for example, ‘first, second, third’) in order to present the issue as a general or common activity or to indicate the habituality or conventionality of the issue (Jokinen 1999b, 152, Fahnestock 1997, 63, Potter 1996, 195–197). The writer might also make an **addition** by using expressions such as ‘in addition’ or ‘etc.’ to stress that the list is actually longer but that for lack of space or some other reason the details are not indicated in the text (Jokinen 1999b, 152, Fairclough 2003, 94–95). The use of **contrast pairs**, for example ‘latest-outdated’ or ‘subjective-objective’, aims to present the option that is supported by the writer in a positive light and the alternative to it in negative light, in order to speak for the rightness or wrongness of the situation (Jokinen 1999b, 153, Fairclough 2003, 89, Kuula 1999, 58).

The writer might **parallel** the issue with something commonly known by the readers in order to make the argument more easily acceptable and understandable (Jokinen 1999b, 153). The use of inverted commas or **quotation marks** indicates that the expression is not being used with exactly the meaning that was originally intended (Ceccarelli 2001, 95). Quotation marks may indicate the relativity,

⁵⁴ Fahnestock (2009, 180) argues that metaphors have ‘acquired a special interest in the rhetoric of science because of their frequently documented role in scientific discourse, both in expert publications and popularizing texts’. On metaphorical language in the making of interdisciplinary fields, see Klein (2009, 270).

context dependence and ambiguity of the statement or expression used, or they may imply that the writer does not quite agree with the quoted text (Luostarinen and Väliverronen 1991, 68). Quotation marks as in the sentence ‘Some of the used sources are “outdated”’ indicate that the expression is being used with a different meaning than the ordinary sense (or that it differs from the usual definition or style), and this aims to give the textual expression an ironic flavour or to present the issue in a ridiculous or perverted light (Potter 1996, 107, 112, Jokinen 1999b, 156, Kotimaisten kielten keskus 2012).⁵⁵

Hedges or hedge-like words or phrases, including expressions such as ‘really’, ‘anyway’, ‘however’, ‘obviously’ or ‘kind of’, measure the word or idea against what is expected to have happened (Tannen 1979, 169, Luostarinen and Väliverronen 1991, 89, Fahnestock 1997, 58, Kuula 1999, 58, Fairclough 2003, 54). The hedge ‘however’ implicates that something might have been expected but that it has not come about, and that something that is partly or wholly the opposite has occurred, against expectations. The use of **contrasting connectives** such as ‘but’, ‘instead of’ or ‘only’ indicate the denial of an expectation in the preceding clause or set of statements (Tannen 1979, 170, Kuula 1999, 58, Fairclough 2003, 89). **Negatives**, as in the sentence ‘these problems have not been profoundly analysed’, reveal that something that was expected did not happen. The use of negatives conversely indicates what can or could have been done (Tannen 1979, 170, Kuula 1999, 57, Jokinen 1999b, 153).

The use of **modalisation** reflects the expectations of the writer on the basis of her experiences and criteria. By indicating that something should have happened, the writer presents the expectation that this type of action is desirable or wanted. Modalisation may be indicated by modal verbs (‘must’, ‘should’, ‘may’ and ‘could’), adverbials (‘certainly’) or participle adverbials (‘required’, ‘provided’) (Tannen 1979, 170–171, Kuula 1999, 57–58, Fairclough 2003, 46–47). In scientific texts, modalisation also produces different effects depending on the argumentative context in which they are inserted, as in the sentences ‘it is a fact that therapeutic touch is unscientific’ and ‘I assume that therapeutic touch is unscientific’ (Latour and Woolgar 1979, 77, Woolgar 1988, 71, Latour 1987, 22–23, Potter 1996, 112).

Evaluative language in the form of adjectives, adverbs and verbs reveals the significance placed upon these qualities and indicates

⁵⁵ For more on irony see Potter (1996, 112), and on irony in scientific texts in particular see Woolgar (1983).

comparisons with some other qualities (Tannen 1979, 173–174, Kuula 1999, 57). These are statements of desirability and undesirability, what is good and what is bad (Fairclough 2003, 109, Simons 1993, 151). For example, the adjective ‘unsystematic’ and ‘careless’ conversely suggest that the writer expected qualities such as ‘system’ and ‘carefulness’ of the phenomenon in question. **Repetition** might be used by a writer to place more emphasis on some argument or to point out the strongest message of the story (Tannen 1979, 167–168, Jokinen 1999b, 154, Kuula 1999, 58). The repetition of the word ‘scientific’ in a short excerpt from a text stresses the quality of something that is considered to be an attribute of science.