

Motivation from values in computerized health interventions

Kaisa Korhonen
Master's thesis
Psychology
School of Social Sciences and Humanities
University of Tampere
October 2011

KORHONEN, KAISA: Motivation from values in computerized health interventions

Master's thesis, 68 p., 2 Appendices with 4 p.

Supervisor: Dr Martti Tuomisto

Psychology

October 2011

There is an urgent need for cost-effectiveness in health care. Computerized health interventions offer a way of reaching large numbers of people, whilst requiring moderate resources. However, if no human contact can be provided within the intervention, users' motivation for health behaviour change might be limited. The effects of personal values as a means to motivate users were researched. It was assumed that integrating a highly personal component to the intervention would make computerized health interventions feel more meaningful and relevant.

The main part of this thesis consists of a literary review of the articles discussing the relation of personal values to motivation. After a primary overview, two theoretical approaches were chosen for further examination: self-determination theory (SDT) and Acceptance and Commitment Therapy (ACT).

According to SDT, both the quantity and the quality of motivation are important. For optimal motivation, humans must feel autonomy, mastery, and connectedness. Supporting these basic psychological needs can help to integrate the values related to certain behaviour, thus making it more self-determined. The SDT approach could provide basis for increasing motivation without conscious values-work (e.g. through a rationale for healthy behaviour, based on personal values).

ACT views valued behaviour as the ultimate goal of any intervention. It focuses on the intrinsically reinforcing nature of valued behaviour. Thus, linking personal values to healthy behaviour could increase motivation for the latter. Preliminary evidence from analogous framing of values and coping with pain supports this rationale. Additionally, focusing on valued behaviour has been shown to increase well-being. However, in ACT values are contextually defined, and thus need to be clarified in detail; the ACT approach could provide basis for increasing motivation through deliberate considerations of personally meaningful values and behaviour.

To further examine the feasibility of supporting motivation through personal values in computerized health interventions, a pilot study was conducted. Respondents ($n = 69$) were presented with messages aimed at increasing motivation for physical exercise. Two of the messages were based on factual information, one on the general idea of a good life, and eight on the main motivational dimensions from Schwartz value theory. Respondents were asked to rate the messages on their motivational quality. The Short Schwartz Value Survey was used to determine the values orientation of the respondents. Descriptive analyses were then performed on the data. It was found that most of the respondents found some of the values-based messages *more* motivating than the messages based on fact alone. However, importantly, most of the respondents rated some of the values-based messages *less* motivating than the fact messages; indicating the need for personally meaningful communication. A majority of the respondents also rated some of the values-based messages more motivating than the general idea of good life, indicating that personalization and precision are important. Generally, values-based messages were rated higher by those with congruent personal values than by those with conflicting values. However, on an individual level, values-orientation alone was not enough to predict which messages the respondents rated highest.

Based on the literature, it appears that values could help to make health interventions personally meaningful. Both active values work and tailoring on values appear feasible. However, for future considerations it would be important to further determine the necessary level of detail for values-based communication.

This thesis was written at the VTT Technical Research Centre of Finland, during the period from April 2010 to May 2011. The study was supported by the SalWe Research Program for Mind and Body (Tekes – the Finnish Funding Agency for Technology and Innovation grant 1104/10).

Contents

| | | |
|-----|--|----|
| 1 | Introduction | 1 |
| 1.1 | Tailoring in health promotion | 2 |
| 1.2 | Approaches to values in computerized health interventions | 2 |
| 1.3 | Research questions | 3 |
| 1.4 | Selection of theoretical approaches and articles | 4 |
| 1.5 | Definition of values | 5 |
| 1.6 | Definition of motivation | 11 |
| 2 | Self-Determination Theory..... | 16 |
| 3 | Relational frame theory and Acceptance and Commitment Therapy..... | 21 |
| 3.1 | Relational frame theory | 21 |
| 3.2 | Verbal behaviour and the side effects of relational framing..... | 25 |
| 3.3 | Relational frame theory, Acceptance and Commitment Therapy, and values..... | 27 |
| 4 | Results from the literature..... | 30 |
| 4.1 | Linking values and motivation..... | 30 |
| 4.2 | Implicit vs. explicit values work..... | 33 |
| 4.3 | Negative effects of some values-related feedback on motivation and well-being..... | 33 |
| 4.4 | Required level of detail..... | 34 |
| 4.5 | Measuring values..... | 36 |
| 5 | Empirical research questions and methods | 37 |
| 5.1 | Research questions | 37 |
| 5.2 | Respondents and procedure | 39 |
| 5.3 | Development of the questionnaire..... | 40 |
| 5.4 | Variable transformations | 41 |
| 5.5 | Results | 43 |
| 6 | Discussion | 51 |
| | References | 59 |
| | Appendix A: Questionnaire..... | 65 |
| | Appendix B: Comments from the respondents (translated)..... | 68 |

1 Introduction

Health is an important objective from both the perspective of the individual and of the society. The population in Finland and other Western countries is getting older and this puts a strain on the public healthcare. In Finland, the dependency ratio (children under the age of 15 and adults over the age of 65 per 100 adults in working age) was approximately 50 per cent in 2009 (Statistics Finland, 2010c). The dependency ratio is expected to grow substantially during the next decades. It is estimated that by 2020 the ratio will reach 65 and by 2030 it will exceed 70. The change is expected to occur in the number of older citizens; no notable change is expected in the number of children under the age of 15. Thus, the change in the dependency ratio is two-fold: there will be more dependents and they will be increasingly more adults in old age. Growing old healthy and maintaining health is an economically pressing concern.

The change in the age distribution in the population poses concrete consequences to individuals in working age. There will be an increasing demand for longer careers and for larger individual contribution towards a balanced economy. This places the workforce under tremendous stress. On the other hand, life expectancy in Finland has grown considerably within the past decades (4.9 years for new-born males and 3.5 years for females from 1983 to 2003) (Statistics Finland, 2003) and there will be an increasing need for the individuals to consider health issues throughout life.

Thus, there is a growing need for health promotion programmes and interventions that are cost-efficient and easy to access. Use of modern technology such as computers and mobile phones in health interventions can offer pervasive solutions to these demands. In 2010 nearly all households in Finland owned at least one mobile phone (Statistics Finland, 2010b). In a representative survey regarding the use of Internet over half of the respondents reported normally using it several times a day (Statistics Finland, 2010a). Increasingly more people are seeking health information and care on the Internet. The survey by Statistics Finland indicated that 57% had searched for health information online. There is a growing market for internet-based health interventions and other personal health technologies.

Computerized health interventions are also gaining support from research. A meta-analysis by Portnoy, Scott-Sheldon, Johnson, and Carey (2008) reported 75 controlled trials between 1988 and 2007. Computerized health interventions were found to have a positive effect on both factors preceding health behaviour (e.g. knowledge, attitudes and intentions) and the actual health behaviours (e.g. tobacco and substance use, sexual behaviour, and nutrition). Internet-based psychotherapeutic interventions have also been developed during the past decade. A meta-analysis

by Barak, Hen, Boniel-Nissim, and Shapira (2008) found a moderate effect size for the effectiveness of computerized interventions for measures on psychological well-being.

1.1 Tailoring in health promotion

Content and message tailoring is a method used to enhance the effectiveness of health communication (Lustria, Cortese, Noar, & Glueckauf, 2009; Noar, Benac, & Harris, 2007). Tailoring refers to targeting the communication to one individual as opposed to providing all users with the same generic communication. That is, varying content can be presented, based on the personal characteristics of the user. The aim is to increase attention and perceived personal importance of the content. Theoretical concepts such as stages of change, health behaviours and risk factors have been used for tailoring. Demographic variables such as age and sex have also been used.

Tailoring can be in the form of personalization, where personally identifiable information (e.g. names or specific behaviours) is integrated into the communication. Tailoring can also refer to giving individual recommendations in the form of feedback. Finally, tailoring can be based on adapting the content of the intervention based on personal variables. At least two recent meta-analyses provide support for tailoring (Lustria et al., 2009; Noar et al., 2007). According to Noar et al. (2007) the use of several tailoring variables makes the approach more effective.

1.2 Approaches to values in computerized health interventions

Computerized health interventions can be made easily accessible and can be accessed any time, anywhere. They offer privacy and can lower the threshold to seek help. However, in a face-to-face setting the therapist or other health care professional can find ways to motivate the client “on the go”. In computerized therapies and health applications there may not be any personal (online) contact or the contact may be limited (Barak, Hen, Boniel-Nissim, & Shapira, 2008). Thus it is important that the mechanisms for motivating the user are built into the application itself.

In order to motivate the user to persevere with the health change, one needs to determine what drives him or her. Since the best motivational goals are those that are intrinsically valuable to the individual (as opposed to those set by the society or social convention), it would seem prudent to take personal values into consideration when figuring out ways to motivate the user.

A majority of Internet-based therapies are based on the cognitive-behavioural approach (Barak et al., 2008). Until recently, there has been little emphasis on personal values in cognitive behavioural therapy. However, with the rise of the so-called third wave of behavioural therapies, such as Acceptance and Commitment Therapy (ACT; Hayes, 2004) personal values and life goals are being emphasized in cognitive behaviour therapy.

ACT is philosophically rooted in functional contextualism (Hayes, Strosahl, & Wilson, 1999). The focus of functional contextualism lies in observing the individual as a whole, in a context defined by both historical and situational factors. Thus, it is never meaningful to consider behaviour independent of context. Because of this, it is important to understand how the context affects both the nature and the function of behaviour. Analyses regarding behaviour are considered accurate if they lead to effective ways for changing problem behaviour.

The goal in ACT is to teach the clients to strive for a life that is concordant with their personal values (Dahl, Plumb, Stewart, & Lundgren, 2009). For that reason, several methods for values work, including values clarification, have been developed within the ACT framework. Use of such methods in computerized health interventions could perhaps be used to gather information on the user for tailoring purposes.

One way to utilize personal values for motivating users would be to have the user state the health change goal in a way that relates it to what to the user holds valuable in life. This would make sense considering that many computerized health interventions are aimed at the prevention of diseases through active lifestyle change. Forman, Butryn, Hoffman, and Herbert (2009) have used this strategy in an open trial of an acceptance-based behavioural intervention for weight loss. However, the effect of the values component on weight loss was not assessed independently in this pilot study. The first study to report meditational results for values measures in ACT was published in 2008 (Lundgren, Dahl, & Hayes, 2008). Thus, the approach is relatively new and it appears that more evidence is needed to decide if a values intervention alone could be used to enhance physical well-being.

However, there are likely to be users that do not find extensive values work relevant to their needs. Thus, more implicit methods, such as tailoring content based on personal values could sometimes be preferable. For instance, linking feedback to previously assessed personal values could be a feasible method for motivating users.

1.3 Research questions

A values approach to health behaviour change could bring more personal meaning to health interventions. This would be especially important for computerized interventions, where interpersonal support does not necessarily exist. Knowing the user's personal values could help to make the intervention feel more personal and relevant. This could bring some of the beneficial consequences of a working therapeutic alliance into personal health technologies: namely, the feeling that the

users' needs and values, rather than health guidelines, are at the heart of the intervention. Thus, the intervention could improve physical, psychological, and social well-being.

However, it is not clear how a values-based approach in personal health technologies would work. It might be that Acceptance and Commitment Therapy does not support more implicit use of personal values for motivation. Thus, at this stage it is necessary to chart if and what testable hypotheses for the use of a values-based motivational strategy arise from different theories. Later, a values-approach could be incorporated into a health intervention and its usefulness assessed.

The chart the possibilities for motivating through personal values, the following research questions were posed:

1. How have values been theoretically linked to motivation in literature?
2. Is active values work necessary or can more indirect references to personal values increase motivation?
3. Can some values have detrimental effects on motivation in that referring to such values decreases motivation?
4. How detailed should the knowledge of a person's values be?
5. How should the values concept be operationalized and assessed?

This thesis was written at the VTT Technical Research Centre of Finland, during the period from April 2010 to May 2011. The study was supported by the SalWe Research Program for Mind and Body (Tekes – the Finnish Funding Agency for Technology and Innovation grant 1104/10).

1.4 Selection of theoretical approaches and articles

Acceptance and Commitment Therapy was chosen as a starting point, as it explicitly discusses behaviour aimed at valued goals. However, other theories that link values and motivation needed to be charted as well.

In their literature review Parks and Guay (2009) discovered there were very few empirical studies on the link between values and behaviour. They cite the self-concordance model on motivation (Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001) that posits a link between the pursuit and attainment of values-concordant goals and psychological well-being. The self-concordance model is based on a motivational theory called self-determination theory. An initial review of both self-determination and self-concordance literature revealed that motivating others is widely discussed in former but not in the latter. Thus, self-determination theory will be discussed in detail.

In their article, Parks and Guay (2009) also refer to expectancy-value theory, pointing out that it implicitly discusses values in the concept of valence. The theory discusses subjective task value that consists of incentive and attainment value, utility value, and cost (Wigfield & Eccles, 2000). However, as a more general approach to personal values was sought, expectancy-value theory was not examined further in this thesis.

Articles were searched for using values and motivation as the primary keywords. Additional derivations were used as needed. The aim was at a comprehensive primary exploration of the literature. Thus, articles were chosen if they appeared to be relevant for understanding the motivational nature of values. As no further relevant theories could be found, acceptance and commitment therapy and self-determination theory were chosen for the basis of this thesis.

1.5 Definition of values

An apparent problem in discussing the link between values and motivation is that the concepts are often used interchangeably (Jolibert & Baumgartner, 1997). Also, it can be difficult to differentiate values from other similar concepts (Rohan, 2000).

Values are often defined as evaluations (Bilsky & Schwartz, 1994; Rohan, 2000). Based on current and early values related literature Rohan (2000) emphasizes that the term ‘values’ should be used for abstract judgements (e.g. “I value freedom”), whereas the term ‘attitudes’ can be used for evaluations of specific entities (e.g. “I value my car”). Additionally, the term ‘values’ should represent subjective evaluations of what the individual desires. This links values to the idea of eudaimonia; human flourishing. That is values are judgements that enable individuals to strive for what they consider to be best possible living.

The Rokeach value theory

Milton Rokeach (1973) defined a value as “an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence” (p. 5). According to his definition values need to be stable, otherwise there could be no continuity in human personality and society. However, if values were completely unchanging, individual and social change would be impossible. Rokeach suggests that change in values reflects change in the priority of values; or the personal value system.

According to the Rokeach value theory (Rokeach, 1973) some values can serve as means (instrumental values) to other valued outcomes (terminal values). Thus, instrumental and terminal

values are functionally connected. However, it is not necessary for the instrumental behaviour to be consciously perceived as instrumental.

Terminal values can be further divided into personal and social values, depending on whom the outcome is thought to serve. For instance, peace of mind as a value is centred on the individual, whereas world peace as a value has an interpersonal focus.

Instrumental values can also be further classified based on their consequences (Rokeach, 1973). Moral values refer to behavioural guidelines that, when violated, lead to feelings of guilt or wrongdoing. By nature, moral values have an interpersonal focus. Competence values are more related to self-actualization than morality. They have a personal focus and are more likely to lead to feelings of shame over personal inadequacy.

Values are thought to be motivational (Rokeach, 1973). Instrumental values are motivational because they offer the means to desired end-states. Terminal values support motivation because they offer lasting goals that can never be fully reached. Additionally, values serve adjustment to society, help to defend the ego and make sense of the reality. Thus, values are active in maintaining and enhancing a positive view of the self.

Rokeach (1973) suggested that values are “the cognitive representations and transformations of needs” (p. 20). In accord with Maslow’s hierarchical theory of needs (Maslow, 1943), the Rokeach value discusses higher- or lower-level values. Higher-level values are considered to be more adjustive, ego-defensive or self-actualizing than the lower-level values.

Based on theories about the number of needs Rokeach (1973) hypothesized that the number of terminal values could range between two and twenty-eight. The number of instrumental values could be several times larger. The Rokeach value survey consists of eighteen instrumental and eighteen terminal values.

The Schwartz value theory

Schwartz has continued the research on Rokeach’s ideas in his theory on the structure of human values (Schwartz & Bilsky, 1987). According to the Schwartz value theory values are relatively persisting individual preferences that stem from socialization (Bilsky & Schwartz, 1994). More specifically, according to Schwartz and Bilsky (1987) values can be defined as “(a) concepts or beliefs, (b) about desirable end states or behaviours, (c) that transcend specific situations, (d) guide selection or evaluation of behaviour and events, and (e) are ordered by relative importance” (p. 551). They also propose that values are cognitive representations of the individual’s biological needs, social needs, and safety needs for the survival and well-being of the group.

The Schwartz value theory classifies the original 36 Rokeach values into distinct motivational domains based on their similarity (Schwartz & Bilsky, 1987). More specifically, the values are thought to form ten latent factors, as represented by the motivational domains. According to the theory, these domains form the basic structure of human values. Schwartz and Bilsky (1987) propose that using the motivational domains rather than individual values can improve reliability in research.

According to the Schwartz value theory the values of an individual may represent different motivational domains (Bardi & Schwartz, 2003). The focus in the Schwartz value theory is on the relative importance of the value domains to the individual; or the individual value hierarchy (Schwartz & Bilsky, 1987).

The psychological, practical and social consequences of pursuing a value can make it compatible or incompatible with the pursuit of other values (Schwartz & Bilsky, 1990). According to the Schwartz value theory the value hierarchy should be based on the behavioural consequences and the ensuing compatibility between valued goals, rather than any conceptual considerations.

The Schwartz value theory (Schwartz & Bilsky, 1987; Schwartz & Boehnke, 2004) posits that the compatibility of different motivational domains can be represented by a circular structure (Figure 1). The closer two domains are on the circle, the more similar and compatible they are. The arrangement of domains on the circle represents a motivational continuum, and opposing domains are thought to represent conflicting valued goals.

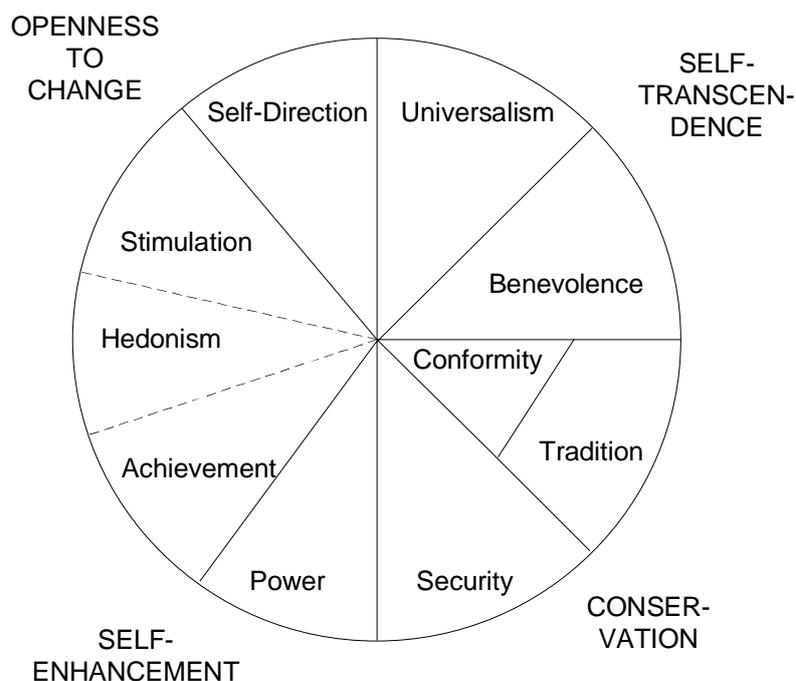


Figure 1. Theoretical model of relations among ten motivational types of values (Sagiv & Schwartz, 2000).

Higher order motivational directions (Figure 1) have also been considered in the Schwartz value theory (Schwartz & Bilsky, 1987; Schwartz & Bilsky, 1990; Schwartz & Boehnke, 2004). It has been argued that the goals related to different values always serve someone's interest. Such grouping would reflect the social—individual division in Rokeach's value theory. Values could also be categories to the degree to which they represent conservation versus openness to change (Schwartz & Boehnke, 2004). However, Schwartz and Boehnke found that any combination of adjacent values can form a higher order value. Thus, the division depends on the topic rather than on any underlying higher order structure in the values.

A division into instrumental and terminal values has also been discussed in the Schwartz value theory (Schwartz & Bilsky, 1987; Schwartz & Bilsky, 1990). In their early studies Schwartz and Bilsky (1987, 1990) found support for the classification. However, they debated on the theoretical plausibility of such division, arguing that terminal values can serve as instrumental to other terminal values. The instrumental—terminal classification is not discussed in the later studies (Bardi & Schwartz, 2003; Sagiv & Schwartz, 2000; Schwartz & Bardi, 2001; Schwartz & Boehnke, 2004).

Drawing on Maslow (Maslow, 1943), a division into values reflecting deficiency needs and values representing growth needs has also been considered in the Schwartz value theory (Bilsky & Schwartz, 1994; Sagiv & Schwartz, 2000). Self-direction, universalism, benevolence, achievement, and stimulation were considered to mainly represent growth needs. It is thought that achieving goals related to growth-values increases their personal importance. Thus, the fulfilment of the growth needs would not eliminate their motivational potential.

According Bardi and Schwartz (Bardi & Schwartz, 2003) most behaviours can reflect more than one value. However, they posit that certain behaviours are normally more closely related to one value. For instance, dominating behaviour can be considered to reflect primarily power values. Bardi and Schwartz (2003) found the correlations between tradition and stimulation values and their expressive behaviours were the strongest, and the correlations between security, conformity, benevolence, and achievement values and the behaviours that express them the weakest. They call out for more research to conclude if values are linked to specific behaviours or to behaviour in general.

Bardi and Schwartz (2003) note that values have been found to affect behaviour through conscious deliberation. However, they postulate there could be other, more implicit mechanisms linking values to behaviour. The implicit—explicit division will be further discussed with regard to motives in p. 12.

Acceptance and Commitment Therapy definition of values

Values in Acceptance and Commitment Therapy represent characteristics of life that are desirable in the long term (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). They reflect the qualities of life that the individual repeatedly chooses to pursue, even though they can never be fully achieved. In ACT, valuing as behaviour rather than feeling is emphasized (Hayes & Wilson, 1994). Also, values are thought to be motivating in that they represent consequences that the individual wishes to achieve (Dahl et al., 2009). Acting to escape or avoid aversive consequences is not considered valuing.

More technically, values in Acceptance and Commitment Therapy can be defined as “freely chosen, verbally constructed consequences of ongoing, dynamic evolving patterns of activity, which establish predominant reinforcers for that activity that are intrinsic in engagement in the valued behavioural pattern itself” (Plumb, Stewart, Dahl, & Lundgren, 2009; Wilson & Dufrene, 2009). This definition is based on the concepts of relational frame theory and will be further discussed in chapter 3.3.

In Acceptance and Commitment Therapy values are always phrased by the individual (Hayes et al., 1999). The definition of values in Acceptance and Commitment Therapy is a working definition for therapeutic discussions and not intended as a global definition of values (Wilson, 2010; Wilson & Dufrene, 2009). Thus, no exhaustive list of personal values exists within the Acceptance and Commitment Therapy framework. Values are often approached through chosen directions in various life domains such as family or work (Hayes et al., 2006).

Definition of values in this thesis

The Schwartz value theory and Acceptance and Commitment Therapy both approach values as self-reported abstract evaluations of the desirable outcomes and behaviours. Thus, in light of the guidelines presented by Rohan (2000) they both could be used as a starting point in the study of the links between values and motivation.

The two definitions of values are not conflicting (see Table 1 for a comparison). Both portray values as enduring guidelines for detecting the desirable ways of acting in varying situations. Both also posit that values represent desirable end states (Schwartz & Bilsky, 1987) or desirable qualities of life (Hayes et al., 2006). According to the ACT definition, valuing increases the motivational consequences of related behaviour. This is not incompatible with the Schwartz value theory; it is reasonable to assume that the importance placed on the underlying value can increase the significance of related behaviour and its consequences. Finally, in both approaches it is assumed that the individual can hold several values with varying importance, thus forming a personal values hierarchy.

Table 1

Comparison of Acceptance and commitment therapy and Schwartz value theory definitions of values

| Theory | Cognition | Volition | Form | Continuity | Relation to motivation | Value structure |
|---------------------------------------|----------------------|---------------|-------------------------|-------------------------------|--|--------------------------------|
| ACT (Wilson & Dufrene, 2009) | Verbally constructed | Freely chosen | Patterns of activity | Ongoing, dynamic | Establish reinforcers intrinsic to behaviour | - |
| Schwartz (Schwartz & Bilsky, 1987) | Concepts or beliefs | Desirable | End states or behaviors | Transcend specific situations | - | Ordered by relative importance |

The Schwartz value theory definition of values will be used in this thesis. First, the Acceptance and Commitment Therapy definition of values is primarily meant for therapeutic work, not as a global definition of values. Second, the Schwartz value theory definition is not based on theoretical concepts specific to one theory. Third, the Schwartz value theory provides a theoretically comprehensive list of different values and their structure, and a survey for their measurement. It is important to note that values in ACT are contextually defined (Hayes et al., 1999), and a predefined set of values may not be useful the ACT context.

Health as a value

Allcock, Sandelowski, DeVellis, & Campbell (2008) have studied the meanings attached to health as a value. Their sample (n = 24) consisted of colorectal cancer survivors and non-affected controls. They found that health was perceived as a value encompassing all of life.

Allcock et al. (2008) found three different descriptions of health as a value. First, health can be considered a prerequisite for other values, such as independence, strength, family and helpfulness (values were derived from the Personal Values Card Sort; see Miller, C'de Baca, Matthews, & Wilbourne, 2001). Second, valuing health can be linked to responsibility as a value. Third, health can be an expression of following God's will.

Health as a value is not placed under any of the ten motivational domains in the Schwartz value theory (Sagiv & Schwartz, 2000; Schwartz & Boehnke, 2004; Stewart & Barnes-Holmes, 2001), as its meaning differs from culture to culture. However, health is one of the 57 values measured in the Schwartz value survey. In a study concerning the structure of goals, similar to Schwartz's on values, health was found to be one of 11 broad motivational goals (Grouzet et al., 2005).

1.6 Definition of motivation

Motivational psychology is characterized by an abundance of theories, constructs, and methods (Buck, 1988; Kleinginna & Kleinginna, 1981). Additionally, the philosophical differences between various approaches often seem irreconcilable.

Many definitions of motivation include descriptions of what motivation is not, thus excluding facets of other definitions of motivation. Thus, any widely applicable definition of motivation should be compatible with as many motivational theories as possible.

Kleinginna and Kleinginna (1981) have categorized theories of motivation based on their common emphasis, finding nine categories of definitions and one critical of the concept. According Kleinginna and Kleinginna (1981) motivation can be seen to arise either from needs, desires, and affect (the phenomenological definitions) or from internal physical processes (the physiological definitions). Alternatively motivation can be seen as either energizing or directing behaviour, or both. Some definitions provide restrictions on the concept of motivation, either temporal or in relation to other psychological processes, or both. Motivation can also be represented as an elaborate cause for (nearly) all behaviour. Finally, the sceptical theories deny the usefulness of the motivation construct.

Buck (1988) has proposed a developmental-interactionist model of motivation that emphasizes the simultaneous and interactive influences of evolutionarily ancient and new systems of behaviour control. The model views motivation as “a *potential* for the activation and direction of behavior that is *inherent in a system of behavior control*” (emphasizing original; Buck, 1988, p. 5). Thus, motivation acts to direct and energize behaviour and is actualized by the appropriate stimulus for that behaviour. Different levels of motivational systems exist and can be hierarchically arranged based on their evolutionary age and openness to influences of learning (Figure 2). The motivational system based on language is given special attention because it is thought to be unique to humans. For instance, humans are capable of controlling their behaviour based on events they have never experienced. In addition, human behaviour can be regulated based on social rules. Also, the inherent need in humans for understanding and consistency of thoughts reflect the motivational processes related to language.

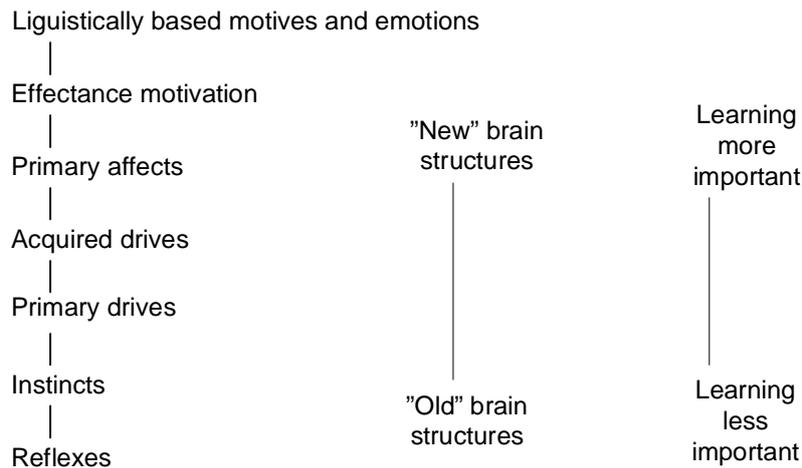


Figure 2. Hierarchy of motivational – emotional systems (adapted from Buck, 1988).

Motives

Behaviour can be thought to reflect implicit or explicit motives. McClelland, Koestner, and Weinberg (1989) have proposed that implicit motives (as measured indirectly by projective tests) reflect spontaneous behaviour, whereas explicit motives (as measured directly by questionnaires) reflect responses in situations where it is necessary to consider social norms. This is reflected in the content of motivational theories; for instance, Maslow (1943) has stated that any motivational theory claiming to be definitive should be more focused on implicit than explicit motivation.

Regarding the findings that intercorrelations between implicit and explicit measures of motives are often low (McClelland et al., 1989), Bilsky and Schwartz (Bilsky, 1998; Bilsky & Schwartz, 2008) have proposed that, rather than differences in the underlying concepts, differences in methodology explain the seemingly weak associations. Their analyses indicate two facets in the measurement of motives: (1) the motives per se and (2) a methodological continuum of implicit and explicit measures.

As for the organization of motives, Bilsky and Schwartz (Bilsky, 1998; Bilsky & Schwartz, 2008) have suggested a similar structure for motives as proposed in the Schwartz value model. In their analyses motives similar to one another on the openness—conservation, and self-enhancement—self-transcendence dimensions grouped together. The method of measurement did not affect these results. Additionally, values grouped with similar motives. However, the implicit—explicit dimension was also observable in the analyses, implying differences in the level of measurement rather than in the content of the motives.

Self-determination theory

Self-determination theory (SDT; Deci & Ryan, 2000) holds basic psychological needs fundamental to understanding human motivation. Needs are thought to form the basis for the reinforcing

qualities of various outcomes. Like physiological needs, the psychological needs in self-determination theory are considered innate and necessary conditions for well-being. According to SDT there are three such needs: autonomy, competence and relatedness. These needs affect both the content and the process of goal pursuit.

Self-determination theory states that motivation is a two-dimensional construct consisting of the amount, or intensity of motivation, and the quality, or type of motivation (Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009). Volitional behaviour is seen as a manifestation of either of two types of motivation: intrinsic or well-internalized extrinsic motivation.

When behaviour is motivated by the inherent satisfaction of the activity itself it is said to be intrinsically motivated (Deci & Ryan, 2000; Ryan & Deci, 2000). Intrinsic motivation reflects the innate human tendency to explore, to seek out new challenges, and to grow. Intrinsically motivated behaviour is not aimed at acquiring specific results and does not require social reinforcement. However, for it to be maintained and enhanced the conditions need to be supportive of the basic needs satisfaction.

In contrast, when the motivation for performing an activity lies in attaining a separable outcome, the behaviour is said to be extrinsically motivated (Brown & Ryan, 2004; Deci & Ryan, 2000). Also, if the purpose of the activity is to aid the achievement of some other goal, the activity is thought to be energized by extrinsic motivation.

Self-Determination theory includes one additional motivational construct, amotivation (Brown & Ryan, 2004; Deci & Ryan, 2000; Ryan & Deci, 2000; Ryan & Deci, 2002). It refers to behaviours that are likely to arise when there's no sense of efficacy or sense of control over the desired outcome.

Motivation in behaviour analysis

Behaviour analysis is based on the notion of continuous interaction between the individual and the environment. The interaction can be considered from a historical perspective; that is, the preceding conditions and the consequences of earlier behaviour have resulted in learning, thus affecting behaviour in similar situations (Tuomisto, Lappalainen, & Timonen, 2005).

Skinner discussed motivation on several occasions (e.g. Skinner, 1957, pp. 212–214), but behaviour analytical literature from the 1960s to the early 1990s lacked any thorough discussion of the concept of motivation (Michael, 1993). Two constructs, establishing operation, or motivative operation (Michael, 1993), and motivative augmental (Hayes, Barnes-Holmes, & Roche, 2001) have later been proposed in the behaviour analytical framework to explain why people choose to engage in voluntary behaviour.

Establishing operations change the rewarding or punishing function of a certain consequence, an effect called reinforcer establishing (Michael, 1993). Establishing operations are a part of the circumstances preceding behaviour (Ramnerö & Törneke, 2008), but can be viewed separately for practical purposes (Figure 3). However, establishing operations affect behaviour beyond situations where consequences are immediately tangible (Michael, 1993). That is, they make various behaviours associated with the consequence more (or less) likely to occur. This is referred to as the evocative effect of establishing operations. For instance, hunger can act as an establishing operation that makes the attainment of food a more rewarding consequence and evokes behaviours that earlier have led to this outcome. Thus, establishing operation can be thought of a factor that affects what is called motivation in general psychological literature (Ramnerö & Törneke, 2008). Because of the positive reinforcing connotations of the terms establishing and evocative, the term motivating operation has also been used to refer to a similar construct (Laraway, Snyderski, Michael, & Poling, 2003).

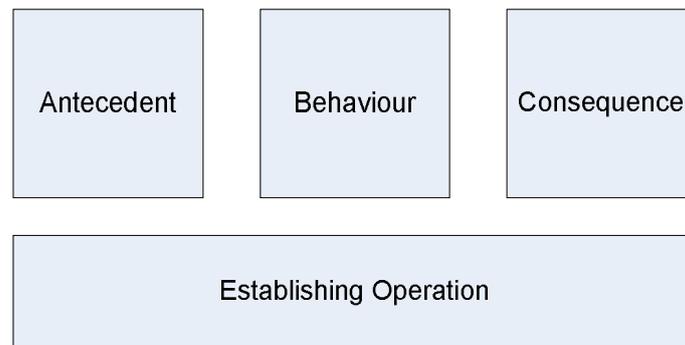


Figure 3. Establishing operation and the antecedents and consequences of behaviour.

At least two links between establishing operations and intrinsic motivation have been hypothesized. First, a specific class of establishing operations, called the transitive conditioned establishing operation (CEO-T) has been proposed as an important factor in intrinsically motivating tasks (Olson, Laraway, & Austin, 2001). Conditioned establishing operations are circumstantial factors that alter the effectiveness of conditioned (as opposed to unconditioned) reinforcers and punishers. A transitive conditioned establishing operation is an event that causes another consequence to become more desirable (or more aversive). For instance, planning to travel to a foreign country can cause the ability to exchange pleasantries in the local language to act as a stronger reinforcer for learning the language. Thus, making plans to travel acts as a CEO-T for learning a foreign language and changes the value of being able to exchange greetings. It has been proposed that such processes may be inbuilt in daily activities and help to explain why some tasks are intrinsically motivating (Olson et al., 2001).

The basic psychological needs, as described in self-determination theory could also be explained as forms of unconditioned reinforcement that are effective in almost all situations (Michael, 1993). They would thus act as unconditioned establishing operations for behaviour aimed at their fulfilment. However, alternative explanation based on generalized conditioned reinforcement is also plausible. Additionally, strong criticism has been expressed in the behavioural analytic literature toward self-determination theory (Bernstein, 1990).

Relational frame theory introduces another concept for motivation in behaviour analysis, namely the augmental. Augmentals are rules that change the degree to which a certain outcome will reinforce behaviour (Dahl et al., 2009; Hayes et al., 1999; Hayes et al., 2001). The relation between the behaviour and the consequence does not need to be one that has been or can be encountered directly; rather the consequence-altering function of the rule is verbally derived (Hayes et al., 2001; Luciano, Valdivia-Salas, Cabello-Luque, & Hernandez, 2009). Two types of augmenting are considered in relational frame theory. Motivative augmentals make established consequences temporarily more effective as reinforcers (Hayes et al., 2001). For instance, the proposition “wouldn’t it be nice to spend more time with your children?” can act as a motivative augmental if the individual highly values spending time with the family. Formative augmentals are rules that establish important reinforcing functions in new stimuli (Hayes et al., 2001). For instance, the sentence “buying this book will teach you ways to plan your schedule more effectively so that you get to spend more time with your loved ones” can serve as a formative augmental. The function of buying the book may now transformed into a means for spending more time with the loved ones.

Definition of motivation in this thesis

Self-determination theory, with its emphasis on intrinsic motivation, is best represented by effectance motivation in the developmental-interactionist model proposed by (Buck, 1988), whereas relational frame theory represents language based motivation. Because of the different levels of motivation described in these theories, a catch-all definition will be used in this thesis, as proposed by Buck (1988). Drawing on his definition of motivation, motivation in this thesis will be defined as a process both directing and activating behaviour that is triggered by a relevant internal or external stimulus. The hierarchical nature of motivational systems is acknowledged.

Based on the analyses by Bilsky and Schwartz (Bilsky, 1998; Bilsky & Schwartz, 2008) it is assumed that the implicit and explicit motives result from differences in measurement techniques and are compatible. Thus, the effects of influencing explicit motivation on implicit motivation, and vice versa, will not be considered in this thesis.

2 Self-Determination Theory

Contemporary motivation theories initially assumed that the motivation to pursue a goal depends on the perceived value of the desired outcome and its attainability (Deci & Ryan, 2000). However, this view did not take into consideration that different outcomes might have not only different amounts of value but also different kinds of value to the individual. It has later been acknowledged that goal types affect motivation. According to self-determination theory the content, or the “what” of goal pursuit is an important aspect in understanding human motivation.

Self-determination theory (SDT; Deci & Ryan, 2000) introduces two motivationally different types of goals: intrinsic and extrinsic. Intrinsic goals reflect the basic psychological needs. It is thought that goals such as maintaining close relationships, learning and growing as an individual, and contributing to the well-being of the community promote the fulfilment of the basic needs. Thus, intrinsic goals are considered to be beneficial for psychological well-being. Extrinsic goals, on the other hand are thought to reflect the need for recognition from others rather than the fulfilment of personal psychological needs (Deci & Ryan, 2000; Vansteenkiste et al., 2004). According to SDT goals such as attaining wealth, power or fame can lead to harmful interpersonal comparisons. Focusing on these goals can make it less likely for the individual to have experiences that support the vital psychological needs.

The perceived reason, or the “why” of goal pursuit, is another important determinant of motivation in self-determination theory (Brown & Ryan, 2004; Deci & Ryan, 2000; Ryan & Deci, 2000). These reasons may vary from the wish to avoid punishment to the pleasure from activity itself. In SDT this variation in behavioural control is referred to as perceived autonomy. Fully autonomous, self-determined behaviour is free-willed and self-endorsed; independent of external control, rules or pressure.

Autonomy is a reflection of whether the behaviour is attributed to internal or external causes. The term perceived locus of causality (Deci & Ryan, 1985) has been used to portray this distinction. It refers to both the intentionality and the volition of behaviour. Acting out of personal interests and aspirations is associated with an internal perceived locus of causality. Conversely, external perceived locus of control refers to attributing the behaviour to some external event. An internal locus of control is necessary for the behaviour to feel genuinely chosen and self-determined.

According to SDT, extrinsically motivated behaviour can be self-determined (Brown & Ryan, 2004; Deci & Ryan, 2000; Ryan & Deci, 2000; Ryan & Deci, 2002). Thus, being extrinsically

motivated does not necessarily imply an external locus of causality; there is no conflict between working towards an instrumental goal and working out of free will. To understand the quality of motivation, it is useful to consider the level of experienced autonomy in extrinsically motivated behaviour.

Self-determination theory distinguishes between four regulatory styles for extrinsic motivation (Brown & Ryan, 2004; Deci & Ryan, 2000; Ryan & Deci, 2000; Ryan & Deci, 2002), ranging from controlled to fully autonomous (Figure 4). The more controlled forms of regulation are targeted at attaining some tangible outcome and avoiding punishment (external regulation) or maintaining self-esteem and avoiding feelings of guilt and anxiety (introjected regulation). Such behaviour is associated with an external perceived locus of causality.

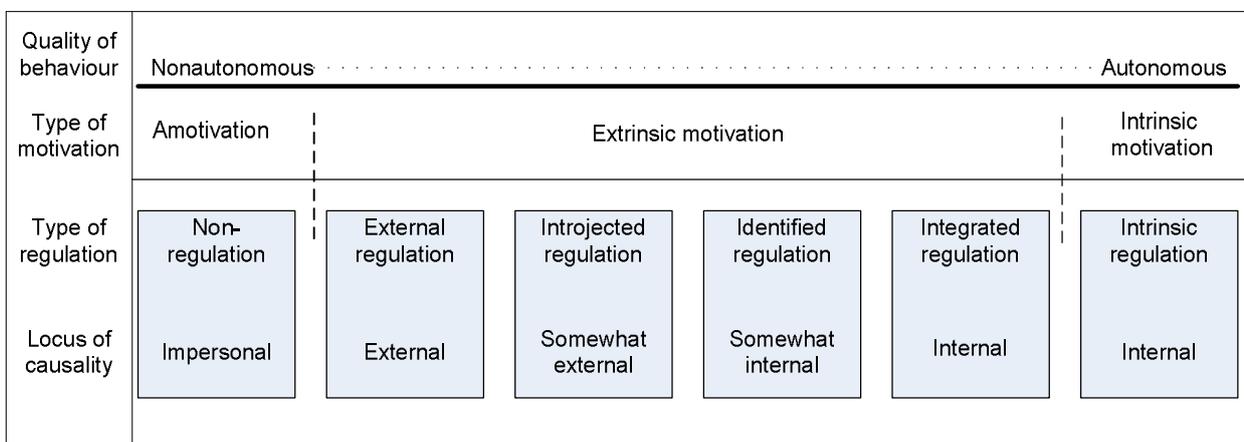


Figure 4. The Motivational Continuum of Autonomy (adapted from Brown & Ryan, 2004).

Consciously valuing the goals or regulations related to behaviour (identified regulation) leads to more perceived autonomy (Brown & Ryan, 2004; Deci & Ryan, 2000; Ryan & Deci, 2000; Ryan & Deci, 2002). At its most autonomous, external motivation stems from behavioural regulation that has been fully integrated into the personal values, goals and needs system (integrated regulation). These types of external motivation are associated with an internal perceived locus of causality. Such behaviour is personally valuable and meaningful. However, integrated regulation differs from intrinsic regulation in that the behaviour is instrumental to attaining some goal, other than the pleasure of the activity in itself.

According to SDT (Brown & Ryan, 2004; Deci & Ryan, 2000; Ryan & Deci, 2000; Ryan & Deci, 2002) there is a natural tendency in humans to integrate the values and regulations related to behaviour. This process is called internalization, and it is determined by both prior experiences and the current context: it is more likely to occur in an environment that supports the basic psychological needs of autonomy, competence and relatedness. As a result of the tendency for

internalization, any behaviour can become more autonomously motivated at any time. The opposite is also true; it is possible for the motivational regulation to become more controlled and less autonomous. It is important to note that according to SDT both intrinsic and extrinsic goals can be pursued with varying levels of autonomy (Deci & Ryan, 2000; Vansteenkiste, Lens, & Deci, 2006).

The value construct in itself has not been widely examined in self-determination theory (Kasser, 2002). However, it has been proposed (Feather, 1995) that values direct behaviour through valences. Starting from infancy, individuals regularly encounter pleasant and unpleasant experiences. Although it is not meaningful to speak of an infant's judgements of these experiences as valuing in the usual sense, an inherent predisposition to seek out pleasant experiences can be observed (Feather, 1995; Kasser, 2002). Kasser (2002) has proposed that these valences arise from the basic needs. Thus, needs-congruent experiences enhance well-being and psychological growth and come to be valued. Later on the valences induced by the values direct the individual towards goals that allow for the fulfilment of the basic psychological needs. If, on the other hand, the individual comes to hold extrinsic values, the valences related to these values would direct the individual towards extrinsic goals.

Holding values such as self-acceptance, affiliation and community feeling is thought to promote self-actualization and psychological growth. On the other hand, emphasizing extrinsic "having-values" is thought to be harmful to psychological well-being (Kasser, 2002). Some of the Schwartz model values can be theoretically linked to the intrinsic values (e.g. stimulation and self-direction to autonomy, and universalism and benevolence to relatedness), whereas others can be seen to reflect the external values (such as Schwartz's definition of power, achievement and conformity values) (Sagiv, Roccas, & Hazan, 2004). Sagiv and Schwartz (2000) found that stimulation, self-direction, and achievement were positively correlated to affective well-being, measured as positive affect. Security, conformity and tradition were found to be linked to decreased well-being. These relations, albeit quite weak, have been interpreted as preliminary indication of the differential effects that holding intrinsic and extrinsic values may have on psychological well-being (Sagiv et al., 2004; Sagiv & Schwartz, 2000).

The effects of environment on the quality of motivation are related to the level of support for the basic psychological needs. The integration of behavioural control and related values can be aided by providing a meaningful rationale for the task, acknowledging any conflicting feelings, and providing choice (Deci, Eghrari, Patrick, & Leone, 1994; Jang, 2008; Reeve, Jang, Hardre, & Omura, 2002; Ryan & Deci, 2000). Integration of regulation applies to behaviour with an external locus of control. Providing a meaningful rationale can help link the current behaviour to personal values and aspirations and shift it to an intrinsic locus of control. Also, what is required for the task

at hand might conflict with what the individual would prefer to do. According to SDT validating and empathizing with these feelings can help align the behaviour with existing values and goals. Finally, providing choice and communicating in a non-controlling manner can help foster feelings of autonomy. Reeve, Jang, Carrell, Jeon, and Barch (2004) have demonstrated in an experimental setting that teachers' autonomy support increases students' engagement. Lim and Wang (2009) have found a positive association between perceived autonomy support and intention to engage in physical activity, mediated by higher levels of intrinsic and identified regulation.

The integration of behavioural control has been found to be linked to both effectiveness and well-being (Deci et al., 1994). It appears that for internalization of values and regulation, extensive support for the basic psychological needs is necessary. Deci et al. (1994) studied the motivational effects of providing a meaningful rationale, acknowledging feelings and conveying choice. They found that none of the facilitating factors alone was enough to lead to integration of regulation. However, conditions that consisted of two or three of the supports were effective. Thus, it was concluded that rather than a single method, a general approach supportive of basic needs is necessary for integration of regulation.

According to self-determination theory (Deci & Ryan, 2000), goal content also affects the psychological outcome of goal pursuit and goal attainment: intrinsic and extrinsic goals have been found to have differential effects on well-being (Kasser & Ryan, 1993; McHoskey, 1999; Vansteenkiste, Duriez, Simons, & Soenens, 2006). Besides individual differences in goal orientation, environments can also differ in the types of goals they promote (Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005; Vansteenkiste, Lens et al., 2006). Further, it has been demonstrated that framing a task as an intrinsic goal in an autonomy supportive manner enhances motivation and performance (Vansteenkiste et al., 2004; Vansteenkiste, Simons, Soenens et al., 2004; Vansteenkiste, Simons, Soenens, & Lens, 2004; Vansteenkiste et al., 2005; Vansteenkiste, Matos, Lens, & Soenens, 2007; Vansteenkiste, Timmermans, Lens, Soenens, & Van, 2008).

It could be that it is better to provide several rationales rather than one. However, providing an additional extrinsic goal has been shown to reduce the positive effects of an intrinsic goal (Vansteenkiste et al., 2004). In a study by Vansteenkiste et al. (2008), framing a task as an intrinsic goal was shown to lead to better learning results and better motivation even for individuals who saw it as an extrinsic task. It has thus been proposed that intrinsic goals are universally more motivating and that there is no match effect between the individual's goal orientation and the effects of framing.

However, this is not to say that personalisation is not important. To aid integration, the rationale for a task should be realistic and personally meaningful (Deci et al., 1994; Vansteenkiste, Simons,

Soenens et al., 2004; Vansteenkiste et al., 2008). An intrinsic goal that is irrelevant to the person is unlikely to lead to more autonomous motivation. It has been shown that a vague rationale can be harmful to autonomy in motivation (Vansteenkiste, Simons, Soenens et al., 2004). It is thought that vague instructions lead to feelings of guilt, shame, and anxiety. Controlling these feelings then leads to an introjected style in regulating behaviour.

3 Relational frame theory and Acceptance and Commitment Therapy

3.1 Relational frame theory

According to relational frame theory (RFT; Blackledge, 2003; Hayes et al., 2001) the key to understanding human behaviour and motivation lies in the insight that humans not only react to single objects, events and other stimuli but also to the relations between them. In RFT this is called verbal behaviour.

For some parts this capability is not unique to humans: many animals can also be trained to detect and respond to relations based on physical, observable properties. In RFT reacting to such relations based on formal similarity is called nonarbitrary relational responding. Responding to relations is learned behaviour and can eventually become generalized so that it is possible to react to the relations between previously unknown objects or events.

However, humans have the unique capability of relating stimuli based on less tangible situational cues (Barnes-Holmes, Barnes-Holmes, McHugh, & Hayes, 2004; Hayes et al., 2001; Hayes, 2004). That is, humans are capable of detecting relations between objects, events or other stimuli that share no formal properties, based on nothing more than social convention. This is called arbitrarily applicable relational responding. It is said that reacting to the nonarbitrary relations is contextually controlled, as what relations are formed depends on social convention rather the more objective physical properties of the stimuli. Thus, the relations will vary from one context to another.

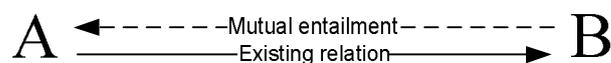
Because of the contextual nature of the relations, any one stimulus can be related to other stimuli in numerous different ways (Fletcher & Hayes, 2005). According to relational frame theory, context affects which stimuli become part of a relation and the type of relation formed (Ciarrochi, Robb, & Godsell, 2005; Hayes et al., 2001). For instance, an event such as retiring from work can be related to various different thoughts, feelings and other events and can have various different meanings related to them, depending on history and contextual cues. The psychological functions, such as the feelings related to the event and other stimulus can also affect how related stimuli are perceived. Again, context is an important determinant in this process.

Numerable different types of relations can be formed. The most fundamental type is coordination (Hayes et al., 2001), a (rough) equality between the stimuli. Which of the many properties of the stimuli are considered similar depends on the context. Opposition and hierarchy are other examples of possible relations.

A special family of relations, called deictic relations are specified by the perspective of the individual (Hayes et al., 2001; McHugh, Barnes-Holmes, & Barnes-Holmes, 2004). These relations can be identified by differentiations such as I—you, here—there, and now—then. In fact, the only common feature in these relations is that they express the perspective of the individual. The highly abstract deictic relations enable humans to react to relations such as ‘what was then’ – ‘what is now’ and ‘who I am’ – ‘who I would hope to be’. They are also crucial for very complex emotions like empathy, as they enable taking the perspective of another person.

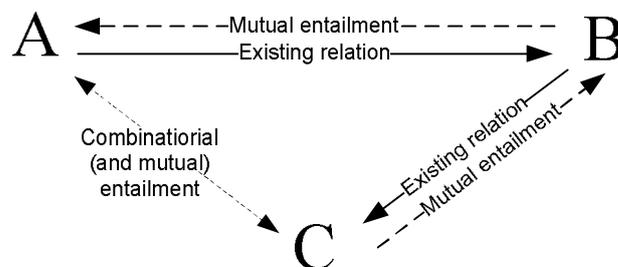
In RFT literature the term relational framing (or relational frame) refers to responding to relations that are, at least partially, based on abstract or socially defined properties (Blackledge, 2003; Hayes et al., 2001). As an outcome of relational framing, new relations can be derived and some stimulus functions transformed. These are the two basic properties of all relations.

The first property, called derived relational responding, means that it not necessary for humans to be explicitly taught all new stimulus relations (Blackledge, 2003; Hayes et al., 2001). Rather, it is sufficient to learn that relations can be derived. For instance, for two events it suffices to know that if the first event is related to the second, then the second event is also related to the first (mutual entailment).



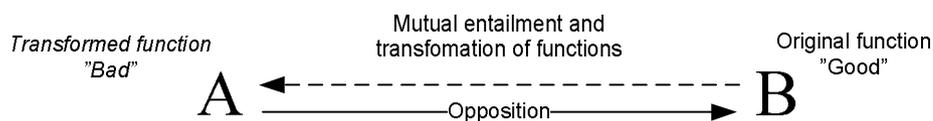
It must be noted that mutual entailment does not imply symmetry in the relation (Hayes et al., 2001). For rough equality (coordination) this happens to be true. However, if one event precedes a second event temporally, the second event cannot also precede the first event.

Deriving new relations is a general process that also applies for relations between more than two stimuli (Blackledge, 2003; Hayes et al., 2001). For instance, if an event is in some way related to two other events, then those events are also related to each other (combinatorial entailment). All derived relations are also mutual. However, it might not be possible to specify the nature of the derived relations.



The second property, transformation of stimulus functions, means that a relation between objects, events or other stimuli can transform their psychological meaning (Blackledge, 2003; Hayes et al.,

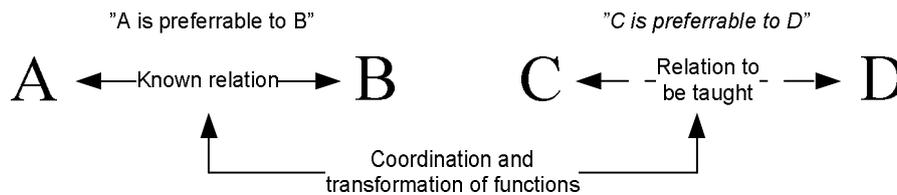
2001). The functions of the first stimuli can simply be transferred to the second, or the functions can be transformed. As derived relational responding is generally learned before transformation of stimulus functions, transformation of stimulus function can happen in the direction of either the trained or the derived relation. Thus, the functions of any stimulus in a relation can change. Thus, a thought, feeling, memory, or other stimulus can have different functions in different contexts.



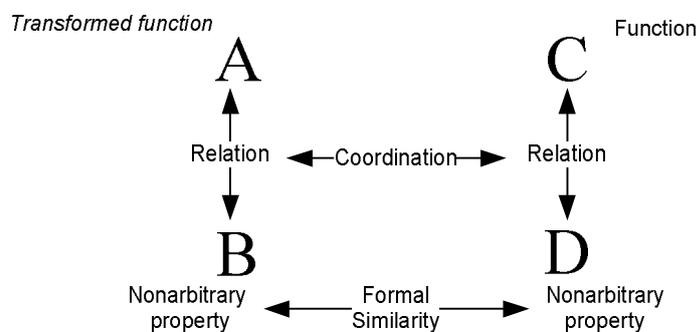
Relational framing explains the complexity and contextual nature of verbal behaviour. Combinatorial entailment and transformation of stimulus functions mean that highly complex relational frames can be formed even from a small number of known relations (Blackledge, 2003; Ciarrochi et al., 2005; Hayes et al., 2001). Additionally, the psychological functions of stimuli can change according to the complex relations. Because relational framing is contextually controlled, the relations are not static.

The ability for relational framing is also related to the human capability for effective learning. Because relations can also be formed between sets of relations (Hayes et al., 2001) it not necessary to learn all the relations one at a time. It is then easier to explain abstract and complex concepts as verbal examples can be used. For instance, the concept of ‘time’ can easier to learn if it is likened to a train that is always running in the same direction and never coming back. Referring to a dictionary definition of time as “a nonspatial continuum that is measured in terms of events which succeed one another from past through present to future” or even “the measured or measurable period during which an action, process, or condition exists or continues” (Merriam-Webster, 2010) might not be as effective.

Analogies and metaphors are the kind of relations between relations that enable humans to quickly transfer knowledge and skills from one domain to another (Hayes et al., 2001; Lipkens & Hayes, 2009). Analogies are relations or equality or near equality between two sets of relations. Analogous framing means that by knowing one set of relations the nature of another set of relations can be understood. Because of relational framing, the psychological functions of stimuli can change (Hayes et al., 2001).



Metaphors are relations between relations that share some formal properties (Hayes et al., 2001; Stewart & Barnes-Holmes, 2001). Like analogies, metaphors are based on two relational networks that are placed in a frame of coordination. However, in addition to the arbitrary coordination between the relations, a more tangible similarity between the relations exists. This formal similarity makes the transformation of stimulus functions more viable.



The distinction between analogy and metaphor is not clear cut (Stewart & Barnes-Holmes, 2001). However, analogies can be derived between stimuli that share no formal properties, whereas metaphors are always based on shared formal properties. Also, the characteristics of stimuli in an analogous relation are equally descriptive of both stimuli. This means that the functions of either set of stimuli could be transferred to the other set. In contrast, metaphors are often based on a hierarchical relation between the relations. That is, the shared property is more characteristic of one set of stimuli. The metaphor accentuates that same property in the other set.

A salient metaphor can increase the likelihood of the transformation of functions, an important goal in the use of metaphors (Hayes et al., 2001). According to RFT effective metaphors are based on common sense. They should not require a lot of contemplation or specialized knowledge to be understood. They should also lead to a strong sensory response in the listener: a metaphor that leads only to analytical thinking is unlikely to be effective. The relations or patterns of events described in the metaphor should also resemble the situation at hand, making the metaphor more salient.

3.2 Verbal behaviour and the side effects of relational framing

Relational framing, after it has been learned, is very pervasive (Hayes, 2004). For the most part human behaviour is verbal in this sense. However, relational framing as a process often goes unnoticed. That is, deriving new relations and transformation of stimulus functions are not normally consciously perceived. The psychological functions of the environment, such as causing feelings of anxiety are instead often seen as inherent qualities of the environment.

According to RFT (Hayes et al., 1999; Hayes, 2004; Hayes et al., 2006) once a relational network is established it is very difficult to dismantle. Trying to control relational framing actually strengthens the network. The relations are activated and the contextual cue “try not to think about this” becomes part of the relational frame. Thus, the thought “try not to think about this” becomes a contextual cue for the relational frame.

Relational frame theory posits that the content of relational networks can be changed by addition rather than subtraction (Hayes et al., 1999; Hayes et al., 2001). It has been suggested that addition of new stimuli could serve to change functions of problematic relations. Clayton has demonstrated that framing chaotic workplaces as more productive of creativity increased the workers’ positive reactions to chaotic workplaces (as cited in Blackledge, 2003). Challenging the workers’ appraisal of a chaotic workplace did not change their attitude.

Another way of affecting the impact of negative relational networks is to target the context in which these relations are perceived to be troublesome (Hayes et al., 2006). For instance, a worrying thought might be given a context in which such thoughts are perceived to be harmful. According to RFT it is possible to change this context, so that the thought might be viewed in a context in which thoughts are acknowledged and accepted, without the need to react on them.

Rule-governed behaviour in relational frame theory is defined as “behaviour controlled by antecedent verbal stimuli” (Hayes & Hayes, 1989, as cited in Hayes et al., 2001, p. 105). That is, when stimuli that are part of a relational network lead to behaviour, the behaviour is said to be rule-governed. Unlike classic contingency shaped operant behaviour this type of behaviour regulation does not require direct previous contact with the stimulus (Dahl et al., 2009; Hayes et al., 2001). In addition to being controlled by verbal antecedent stimulus rules should bring together two or more relations and alter the functions of the natural environment (Barnes-Holmes et al., 2004; Hayes et al., 2001).

Rules make it possible for humans to quickly learn how to behave in a certain situation (Dahl et al., 2009). According to RFT humans are constantly deriving rules from their own behaviour or learning from others. This can also lead to the formation of inflexible rules. For instance, rules can

come to influence behaviour over other sources of information; they continue to be followed even if there is evidence that this is no longer efficient.

Relational frame theory discusses three types of rule-following that vary in their behavioural flexibility (Dahl et al., 2009; Hayes et al., 1999; Hayes et al., 2001). First, a rule can be followed because doing so has brought about socially mediated positive consequences in the past (pliance). That is, reinforcement comes from following the rules, not from the natural consequences of the behaviour described in the rule. Pliance is the type of rule following that develops earliest in life (Hayes et al., 2001). Of the different types of rule-governed behaviour it is also the most persisting because it is not affected by the direct consequences of the behaviour (Hayes et al., 1999).

Second, tracking is rule-governed behaviour that is reinforced by the natural consequences of the behaviour (Dahl et al., 2009; Hayes et al., 1999; Hayes et al., 2001). That is, the rule is accurate. The consequences can also be social, as in the rule “if you are rude to your neighbours they will think you’re a rude person”. This is a natural consequence of the behaviour, not a socially mediated consequence of following a rule per se. According to RFT tracking is more flexible than pliance, as it is easier to observe if the rule is inaccurate. However, it is possible that a rule intended to be tracked leads to pliance.

Third, augmentals are rules that are followed because they make an outcome more reinforcing (Dahl et al., 2009; Hayes et al., 1999; Hayes et al., 2001). Augmentals can increase or decrease motivation by establishing reinforcers for the behaviour or by abolishing aversive effects of the behaviour (Fagerstrøm, 2007). For instance, an employer wishing to promote the health of the employees could start a campaign for walking or cycling to work. Prizes at the end of the campaign could serve as reinforcers for daily physical activity. The company could also set up a gym at the workplace with the rationale that not having to make the trip to a sports club might abolish some of the aversive effects of regular exercise. Motivation can be decreased by augmentals that either establish aversive effects or abolish existing reinforcers. For instance, charging a fee to go to the company gym can establish an aversive effect on using the gym. On the other hand, exercise promotion programmes may be viewed as an intrusion on the employees’ private lives. This might abolish some of the reinforcing effects of the enjoyment from physical exercise.

According to RFT the ability to relational framing means that humans can respond to if – then relations that never have been or never can be directly experienced (Hayes et al., 1999; Hayes et al., 2001). For instance, humans are capable of responding to a verbally constructed future. Thus, the reinforcing stimuli for rule-following can be highly abstract.

3.3 Relational frame theory, Acceptance and Commitment Therapy, and values

Acceptance and Commitment Therapy (ACT, Hayes et al., 1999) is a behavioural treatment based on relational frame theory. The focus of acceptance of commitment therapy is in reducing excessive reliance on relational framing or rule-following (Dahl et al., 2009; Hayes et al., 1999). As discussed earlier, rule-following might become inflexible. The individual might start acting on their thoughts and not on the actual environment. Thus, behaviour might become restricted and the active pursuit of valued goals less likely. The two main components of Acceptance and Commitment Therapy focus on these two aspects: reducing the dominance of thoughts (including any direct attempts to control thoughts, memories and emotions) and committing to the active pursuit of values (Plumb et al., 2009). The efficacy of different ACT techniques is measured against these goals.

Acceptance and Commitment Therapy holds the functional analytic description of goals as “motivative augmental rules that can transform the psychological functions of the environment in important ways” (Plumb et al., 2009). That is, values function by temporarily making values-related consequences more potent.

As augmentals, values are rules but they also need to be freely chosen (Plumb et al., 2009). Valued behaviour should not be continuously motivated by the wish to escape aversive consequences. However, valuing might evolve from former aversive control. Also, the same action can be motivated by values at times and by aversive consequences at other times. Values should also be freely chosen in the sense that they do not follow from the wish to please others but are reinforcing in and of themselves.

Values are only effective as motivative augmentals if there are effective established reinforcers that are intrinsic in the valued behaviour (Plumb et al., 2009). For instance, personal growth as a value can temporarily increase the motivational power of learning a new skill or engaging in an interesting debate.

From the RFT and ACT perspective values form a part of hierarchical relational networks that consist of abstract valued consequences, more concrete goals based on the aspired consequences, and specific actions aimed at achieving those goals (Plumb et al., 2009). Values tie goals verbally into coherent sets (Hayes et al., 1999). Thus, it is possible to discriminate goals as values consistent or inconsistent.

Because the abstract valued consequences can never be fully achieved, the pursuit of values is more effective than the pursuit of single goals in reducing excessive reliance on relational framing (Hayes et al., 1999; Plumb et al., 2009). In addition, values are not likely to change or lose their

meaning. Thus, values can be more effective in maintaining persistent behaviour over long periods of time.

Individual actions may or may not work towards achieving valued goals (Plumb et al., 2009). However, Acceptance and Commitment Therapy emphasizes the pursuit of valued goals as a process (Hayes et al., 1999). Goals are considered important in setting a direction towards valued consequences but aspiring towards valued directions is in itself the desired outcome.

According to ACT, values-congruent behaviour is possible even if the consequences in the moment are unpleasant (Kanter et al., 2010). Values can thus act as a bridge over the present aversive consequences so that the valued long-term consequences can be reached. It has been argued that it would be more felicitous to say that values represent what is approved rather than what is desired (Robb, 2007). Approving here refers to what is desirable on reflection or in the long term. Thus, what is desired in the moment may or may not be what is important.

It is possible to phrase personal values in terms that lead to verbal traps (Luciano Soriano, Rodríguez Valverde, & Gutiérrez Martínez, 2004). First, the value can be stated in a way that is contradictory to the realities of human existence. Second, the necessity to achieve certain outcome, such as being liked by everyone, can be phrased as a value. Third, the value can be stated as the desire to achieve goals without any struggle or stress. Other problems with values statement may arise when values are stated as outcomes (reaching a certain goal) rather than as the process of valued action itself (Plumb et al., 2009). In addition, valued behaviour might be under aversive control. For instance, the desire to escape painful thoughts can be phrased as a personal value. Thus, values clarification is seen as an important technique throughout Acceptance and Commitment Therapy.

According to ACT the distinction between values and goals is important because socially conditioned reinforcers such as having money, beauty or power, or being right can be mistaken for values (Dahl et al., 2009). These secondary reinforcers are not thought to hold considerable intrinsic value. Thus, they are not values in the ACT sense. This does not imply that they cannot be important goals for the individual. What is significant is assessing their functional value with respect to deeply held personal values.

It has been noted in ACT literature that future research should clarify whether values function as processes of change or as outcomes (Plumb et al., 2009). The role of values as processes can be examined through the role of values as mediators or through their relations to other variables of interest. However, the verbal process of valuing can be difficult to measure directly. Valued living as an outcome can be easier to measure but it is necessary to establish that the behaviour does not arise from pliance or avoidance that are observed as apparent valuing.

It has been demonstrated in laboratory studies that analogous framing of coping with pain and persisting with valued goals can increase tolerance to painful stimuli (Plumb et al., 2009). It is theorized that values provide a context that enables the acceptance of painful feelings, thoughts and memories. One cold-pressor study showed that a values intervention on top of an acceptance intervention significantly increased tolerance to pain compared to both control and acceptance alone interventions (Branstetter-Rost, Christopher, & Douleh, 2009). Another study using brief electrical stimulation provided similar results (Páez-Blarrina et al., 2008). However, in this study it was also found that a values intervention alone was effective in increasing tolerance to pain. Páez-Blarrina et al. (2008) hypothesized that “by contextualizing the pain in a frame of hierarchy between the person’s values and his private events, pain might become less important than values” (p. 95). Values-consistent behaviour has been shown in applied ACT studies to be linked to several measures of physical and psychological well-being (for an overview see Plumb et al., 2009). In one case study a values intervention alone was sufficient in reducing harmful alcohol use (Heffner, Eifert, Parker, Hernandez, & Sperry, 2003). Also, in an experimental study on the mediating effects for change in an ACT intervention, it was found that attaining valued goals positively affected the physical health of patients with epilepsy (Lundgren et al., 2008).

4 Results from the literature

Conceptually, it is easy to determine that values are linked to motivation. Values have been conceptualized as internalized standards for the selection of behaviour (Bilsky & Schwartz, 1994). Motivation can be conceptualized as the (potentially) energizing force that can both activate and direct behaviour in the presence of the appropriate stimulus (Buck, 1988). Thus, by definition, values are motivational in that they direct behaviour. Feather (1995) has proposed that values affect choices through the valences on potential actions.

The goal of this literature review was to determine if, in the light of current theories, values could be used to support motivation for health behaviour. Both self-determination theory and Acceptance and Commitment Therapy have been studied in relation to health behaviour. However, values are not the only component in either approach. Focusing solely on articles discussing values and health behaviour would have left very little material to work with. Thus, the results are presented for the link between values and motivation in general and any specific issues related to health behaviour interventions are addressed in the Discussion (p. 51).

4.1 *Linking values and motivation*

Self-determination theory

The quality, and the quantity, of motivation are of interest in the self-determination theory (Deci & Ryan, 2000). SDT posits that valued goals (goals with internal perceived locus of causality) are pursued with higher level of autonomy than are goals imposed on the individual (Deci & Ryan, 1985). According to SDT support for the basic psychological needs (autonomy, competence, and relatedness) aids the natural tendency in humans to internalize values. Thus, SDT posits that the mechanism for motivating others involves supporting the internalization of values (see diagram below).

Needs support → Integration of values → Increased autonomy in behaviour

Motivation from values would in this context mean increased quality of motivation through the integration of essential values.

One of the means proposed in the STD research for supporting the basic psychological needs is providing a meaningful rationale for the task. Evidence from several SDT studies suggests that for optimal motivation the task should be framed as an intrinsic goal (a goal related to intrinsic values).

Of the ten studies focusing on basic needs support and intrinsic framing of tasks examined for this thesis, nine were based on an experimental setting (Table 2). However, many were cross-sectional, or the follow-up period was very brief. The procedure involved only one instance of providing needs support and/or an intrinsically framed rationale. Thus, the long-term effects of a single intervention or the cumulative effects of an on-going intervention could not be determined. In addition, the mediating effects of the integration of values and behavioural control were only examined in a few studies.

Acceptance and Commitment Therapy

Values in Acceptance and Commitment Therapy are closely linked to motivation in that valuing is seen as the active pursuit of valued goals. The effect of values on motivation in ACT is two-fold: they serve as broad, relatively stable goals that direct behaviour over long periods of time (values as directions in life) and, in the present, they can motivate the individual to overcome obstacles to work towards the valued goal (values as motivational contexts) (Dahl et al., 2009).

Working towards valued goals can promote persistence in other behaviour as well, as values can be seen as a context that enables acceptance of unpleasant thoughts and feelings (Hayes et al., 1999; Plumb et al., 2009). This approach, based on analogous relational framing, has been empirically researched in at least two ACT studies (Branstetter-Rost et al., 2009; Páez-Blarrina et al., 2008).

The basis of Acceptance and Commitment Therapy lies in empirical research. However, most of the research lies in the area of relational frame theory or ACT interventions as a whole. For instance, the feasibility and effects of training analogous framing has been examined in some studies. However, there have not yet been many studies on the applications of analogous framing, such as improving persistence through values.

A values element is an integral part of many clinical ACT studies. For the most part these studies have not analyzed the effectiveness of the values component in the interventions. Some evidence exists from a case study on alcohol misuse (Heffner et al., 2003) and an experimental study on the treatment of epilepsy (Lundgren et al., 2008) that the values component is effective in improving health-related outcomes. However, in the light of the articles reviewed for this thesis, the evidence linking values to motivation for behavioural change remains implicit. This is in part because the main focus in any ACT intervention is on increasing valued behaviour, and any positive change in specific health behaviours is considered a welcome side effect (Heffner et al., 2003). However, for individuals with a particular interest in maintaining or improving personal health, values work could result in more – or more specific – goals and actions in the service of health as a value.

Table 2

Self-determination studies related to supporting motivation through values

| Authors | Application area | Study design ^a | Measurements | Main results from values perspective |
|---|--------------------|---------------------------|---------------------------------------|--|
| Deci et al., 1994 | Attention | E | Behavioural, self-report | Providing a meaningful rationale, acknowledging feelings , and conveying choice promote internalization of behavioural regulation. |
| Reeve et al., 2002 | Learning | E, C | Self-report, behavioural | Providing a rationale in an autonomy supportive manner increases effort. The effect is mediated by identification with the tasks personal value. |
| Reeve et al., 2004 | Learning | E, L | Behavioural | Teachers' autonomy support increases students' engagement |
| Vansteenkiste et al., 2004 | Learning | E, C | Self-report | Providing and intrinsic goal or an intrinsic + extrinsic double goal increases mastery orientation, performance, and persistence. The intrinsic goal alone is more effective. Mastery orientation fully mediated goal content effects on both performance and persistence. |
| Vansteenkiste, Simons, Soenens et al., 2004 | Exercise, learning | E, L | Self-report, behavioural, performance | Framing as an intrinsic future goal increases autonomous motivation for exercise, performance, and long-term motivation. Presenting goals in an autonomy supportive manner provided the same positive effects. |
| Vansteenkiste et al., 2005 | Learning | E, L | Self-report, performance | Intrinsic goal framing results in better processing of study material. The effect was present four weeks later. Instructions that induced internal control resulted in more superficial learning than did autonomy support . |
| Vansteenkiste et al., 2007 | Exercise, learning | E, L | Self-report, behavioural, performance | Extrinsic task framing shifts focus towards outperforming others, and away from the interest in the task itself. Intrinsic framing has the opposite effect. The effects of goal framing on performance the individual's focus. Experimentally activating ego-involvement hinders performance. |
| Jang, 2008 | Learning | E, C | Self-report, behavioural, performance | Providing a rationale facilitates engagement, which leads to better qualitatively better learning. Changes in engagement are mediated by identified regulation. Providing a rationale also decreases the rate at which engagement decreases. |
| Vansteenkiste et al., 2008 | Learning | E, C | Self-report, behavioural, performance | Intrinsic goal framing leads to higher autonomous motivation, persistence, and conceptual learning compared to extrinsic goal framing. The effect was not moderated by individual goal orientation or perception of the task as serving an intrinsic or extrinsic goal. |
| Lim & Wang, 2009 | Exercise | C | Self-report | Perceived autonomy support increases intention to engage in physical activity. The association is mediated by the quality of motivation |

^a E = Experimental, C = Cross-sectional, L = Longitudinal

4.2 *Implicit vs. explicit values work*

Next, it was necessary to determine if, in the light of current literature, the motivational effects of values could benefit health behaviour without the user actively engaging in values work such as values clarification.

Self-determination theory

Certain types of goals (related to intrinsic values) were found to lead to more autonomous behaviour and increased psychological well-being. Although SDT provides some insight into motivating others, it is not a therapeutic approach. Thus, active values work as such was not discussed in any of the self-determination articles covered in this thesis. Rather than having the individual reflect on their personal values, framing tasks as intrinsic goals was suggested (Table 2). Additionally, the integration of the regulations for behaviour, such as related values, was found to be supported by the fulfilment of basic psychological needs. Thus, the self-determination theory and research point to the direction of implicitly motivating with values.

Acceptance and Commitment Therapy

Active pursuit of values has been presented as both an active component in Acceptance and Commitment Therapy and the desired outcome (Plumb et al., 2009). The analogous framing studies on values and persistence also used active reflection on personally meaningful values (Branstetter-Rost et al., 2009; Páez-Blarrina et al., 2008). Values interventions in the form of conscious values work can lead also to positive changes in health behaviour (Heffner et al., 2003). Thus, in the light of the current research values work in ACT means actively and purposefully working on personal values.

4.3 *Negative effects of some values-related feedback on motivation and well-being*

If aspiring to use values as a tailoring variable or a basis for a self-discovery tool in a personal health application, it is imperative to know for certain that doing so causes no harm to the user. For this purpose, research regarding the theories reviewed in this thesis was studied to find if some values were thought to have detrimental effects on motivation or well-being.

Self-determination theory

Differential effects on the pursuit and attainment of goals related to different intrinsic and extrinsic values have been demonstrated on SDT. Intrinsic values are thought to promote the fulfilment of

basic psychological needs, whereas extrinsic values are thought to have a harmful effect on it (Kasser & Ryan, 1993). Thus, the pursuit of extrinsic values has been considered harmful to psychological well-being. Extrinsic goals have also been shown to decrease motivation (Vansteenkiste et al., 2004). Several studies on the detrimental effects of extrinsic values on psychological values could be found within the SDT framework (Table 3). Additionally, there were studies regarding the harmful effects of extrinsic goal framing on motivation. However, what has not been studied in the articles reviewed here is how motivation would be affected if the extrinsic values related to certain behaviour became integrated into an individual's personal values system.

Acceptance and Commitment Therapy

According to ACT what are considered extrinsic values in SDT are not values at all (Dahl et al., 2009). Goals such as attaining power or wealth are seen as socially formed reinforcers. They can be related to values but their effects depend on their functional meaning in the pursuit of personally meaningful values. From the ACT perspective values could be detrimental for motivation if they are stated in a manner that makes them paradoxical verbal traps. Thus, thorough and continuous values clarification is considered essential in Acceptance and Commitment Therapy. However, no research on the potential detrimental effects of values-based goal setting could be found within the ACT literature.

4.4 Required level of detail

The optimal level of detail on the knowledge of an individual's values is essential for tailoring purposes. Ideally, the level should be detailed enough for the messages to feel personal. However, if it is too detailed, computerized tailoring becomes impossible.

Self-determination theory

According to some SDT research, intrinsic goals are the most motivating even for individuals who hold an extrinsic orientation to the task at hand (Vansteenkiste et al., 2008). In this light, it would appear that it would be best to offer an intrinsic rationale regardless of the individual's orientation. Overall, all SDT studies reviewed here have used predetermined, non-tailored intrinsic/extrinsic rationales to motivate all participants (Table 2). The intrinsic—extrinsic division of values as well as the openness to change—conservation and self-transcendence—self-enhancement motivational domains in Schwartz value theory offer a very broad estimate of the individual's value orientation. Studies regarding Schwartz value theory have demonstrated that the ends of both broad motivational continuums are conflicting. Thus, on the population level inferences on behaviour can be drawn based on these very coarse estimates of personal values. However, it is not clear, based on

the articles reviewed here, if these values dimensions (perhaps in addition to other tailoring variables) give enough information on what would be motivating on an individual level.

Table 3

Self-determination studies related to differential effects of intrinsic and extrinsic goals.

| Authors | Applica- tion area | Study design ^a | Measure- ments | Main results from values perspective |
|---|-----------------------|------------------------------|---------------------------------------|---|
| Kasser & Ryan, 1993 | Well-being | C | Self-report | Strong relative emphasis on self-acceptance, affiliation and community feeling as personal aspirations is related to higher well-being and less distress. The opposite is true for strong relative emphasis on financial aspirations. |
| McHoskey, 1999 | Well-being | C | Self-report | Control-oriented motivational orientation (aspirations for financial success and a relative de-emphasis on community, family, and self-love related goals) was linked to alienation and antisocial behaviour |
| Sagiv & Schwartz, 2000 | Well-being | C | Self-report | Achievement, self-direction, stimulation, tradition, conformity, and security values correlate positively with affective well-being. No relation with cognitive well-being. Well-being is dependent on congruence between personal values and value environment. |
| Vansteenkiste et al., 2004 | Learning | E, C | Self-report | Providing an extrinsic goal in addition to an intrinsic goal decreases mastery orientation, performance, and persistence. |
| Vansteenkiste, Simons, Soenens et al., 2004 | Exercise, learning | E, L | Self-report, behavioural, performance | Framing as an intrinsic future goal increases autonomous motivation for exercise, performance, and long-term motivation, as does presenting the goal in an autonomy supportive manner. |
| Vansteenkiste et al., 2005 | Learning | E, L | Self-report, performance | Intrinsic goal framing results in better processing of study material. Instructions that induced internal control resulted on more superficial learning than did autonomy support. |
| Vansteenkiste et al., 2006 | Well-being | C | Self-report | No match effect between values and environment for well-being. Lower well-being and higher substance use in students that place higher emphasis on external values is mediated by their values orientation. |
| Vansteenkiste et al., 2007 | Exercise, learning | E, L | Self-report, behavioural, performance | Extrinsic task framing shifts focus towards outperforming others and away from the interest in the task itself, affecting performance. Experimentally activating ego-involvement hinders performance. |
| Vansteenkiste et al., 2008 | Learning | E, C | Self-report, behavioural, performance | Intrinsic goal framing leads to higher autonomous motivation, persistence, and conceptual learning. Individual goal orientation or perception of the task did not moderate the effect. |

^a E = Experimental, C = Cross-sectional, L = Longitudinal

Acceptance and commitment therapy

According to ACT it is possible to determine if goals are consistent with personal values (Hayes et al., 1999). However, as a contextual approach ACT offers no predetermined method or categorization for identifying such values. Rather, values clarification is an active process in the therapy: it is entirely up to the individual to figure out how they want to choose their personal values. Thus, the level of detail needed depends on what is suitable to the individual's needs.

4.5 Measuring values

What could be determined from the articles reviewed here is that there exists some evidence that measures of implicit and explicit motives reflect essentially the same thing (Bilsky, 1998; Bilsky & Schwartz, 2008). In these studies values represented implicit motives.

However, no conclusive evidence could be found on how values should be measured. This is due to the fact that a motivation-through-values approach based on SDT would require very different tools than would a similar approach based on ACT.

5 Empirical research questions and methods

The empirical study was designed as a preliminary view into the possibilities of supporting motivation through personal values in computerized health interventions. Phrasing feedback and other information on personal values could make the communications feel more personally relevant. Also, finding motivation for health behaviour change in personal values could help the users persist when faced with obstacles.

The aim of this pilot study was to gather experience on the effects of phrasing messages based on the Schwartz values. The goal was to determine if a values-based approach affects the motivational quality of feedback. The study was designed with descriptive analyses of the data in mind. The aim was to gain an insight into the feasibility of values-based feedback and direction for future studies.

5.1 Research questions

Several notions arising from the literature require further empirical examination if a values approach in personal health technologies is to be considered. However, only a very coarse preliminary examination of these questions was possible within the scope of this thesis. No conclusive evidence was expected to arise and thus the research questions were not formulated as specific hypotheses.

Research Question 1. Based on the SDT-literature it was assumed that providing a rationale for exercise increases motivation (Table 2). As suggested in the SDT literature literature (Deci et al., 1994; Vansteenkiste, Simons, Soenens et al., 2004) a clear, personally meaningful rationale is better for motivation than a less precise rationale. Values are by definition deeply personal and meaningful (Schwartz & Bilsky, 1987) and could provide a workable basis for providing felicitous feedback. On the other hand, elaborating on the relational frame theory perspective, placing valued behaviour in a relational frame with exercise could help to transform the psychological functions of engaging in physical exercise. Values are understood as motivational augmentals in RFT (Hayes et al., 2001). It would be beneficial if the motivational power of values could help to increase motivation for physical exercise. To test the overall feasibility of motivating for physical exercise using personal values as reference, two types of rationales were compared:

- a. Exercise gives energy
- b. Exercise gives energy to live according to personal values.

It was presumed that the second approach would be rated more motivating.

The aim of the study was to provide information on how values might promote motivation for health behaviour in a personal technology setting. As a result, it was necessary to present all respondents with the same messages, as other tailoring variables might have confounded the results. According to the Schwartz value theory values form a circular structure, and placing great personal meaning to values on opposing sides leads to a conflict in values (Schwartz & Bilsky, 1987). Additionally, according to ACT values are considered only as what the individual chooses to pursue (Dahl et al., 2009). From the ACT perspective it is not rational to consider feedback based on someone else's values as values-based feedback for the individual. To take this into account, two questions were examined. First, it was checked if some of the values-based rationales would be rated *more motivating* than fact-based rationales (Question 1a), as was presumed. Second, it was assumed that some values-based rationales would be rated *less motivating* than fact-based rationales (Question 1b).

Research Question 2. The outcome of valued living is eudaimonia; living a good life to one's full potential (Rohan, 2000). Thus, it could be that simply referring to this outcome could serve as a meaningful rationale, as discussed above. If this were true, tailoring on values would be redundant. However, it was also noted that according to the self-determination research the rationale should not be vague, as this might lead to more introjected regulation of behaviour (Vansteenkiste, Simons, Soenens et al., 2004). It could thus be argued, that a rationale based on eudaimonia is neither personal not specific enough to be very motivating. From the perspective of relational frame theory values form relational frames that link the desired outcome of valued behaviour on the abstract level, goals related to valued directions, and the specific behaviour actions to achieve those goals (Hayes et al., 1999). The idea of eudaimonia could be considered representative of the abstract level, and specific values of a more concrete level. To determine if a more specific (concrete) rationale would be rated *more motivating* than a vague (abstract) rationale (Question 2), the motivational power of the following rationales was examined:

- a. Exercise gives energy to live a good life
- b. Exercise gives energy to live according to a specific valued goal.

Research Question 3. Based on the idea that values are motivational (Schwartz & Bilsky, 1990), it was assumed that the rationale that best matches personally held values would be the *most motivating* (Question 3). Such a match could indicate that personal values can be used to predict what feedback the individual would find the most motivating.

Research Question 4. Based on SDT intrinsic goals are better for motivation than extrinsic goals (Table 2). In Acceptance and Commitment Therapy these goals are not considered to be based on values (Dahl et al., 2009) but on socially conditioned reinforcers. It was thus examined if

respondents would rate rationales related to extrinsic goals *less motivating* than rationales related to intrinsic goals (Question 4).

A more in-depth approach to values work could not be examined in this study. However, a tool for personal values work could be beneficial to some users. Such a tool could be presented after the user has filled a values survey. It was examined if filling the questionnaire alone could make some respondents consider the link between values and behaviour. It was thought that such users might welcome a tool for more thorough values work.

5.2 Respondents and procedure

This study was planned as a pilot study and as such was not designed to be representative of any population. As such, sampling bias and non-response bias were not considered or accounted for. However, to get more varied responses, two samples were collected to better represent individuals in different stages of life. It was hoped that this would lead to more variation in personal values and in the willingness to reflect on them. Responses in the two samples were examined collectively.

The respondents in sample 1 were $n_1 = 48$ psychology students from the University of Tampere (42 female, 6 male). Sample 2 consisted of $n_2 = 21$ employees from VTT Technical Research Centre of Finland (7 female, 14 male). As this was study was designed to be a pilot study, no further demographic variables were measured.

All data was collected electronically using the Webropol 2.0 service. Respondents were recruited via emails sent to student/organization mailing lists. A notice was posted on the list introducing the study and establishing confidentiality of participation. Participation was fully voluntary and was not compensated in any way. There were two versions of the message, minimally tailored to each group. A link to the questionnaire was included in the message. The links were specific to group but not to individual respondent.

There was no randomization procedure in the recruitment process and all respondents were included in the study. For the first sample response rate could not be computed. For the second sample response rate was 49%. For sample 1, the survey yielded more than the target number of responses ($n_1 \geq 20$) in just two days, and the number of respondents was not expected to rise significantly. Due to a local holiday season the survey form was left open for nine days and two reminders were sent to sample 2, finally yielding the expected number of responses ($n_2 \geq 20$).

All instructions and questionnaires were provided in Finnish only. At the beginning of the questionnaire the respondents were instructed to envision themselves in a situation where they are not getting regular physical exercise and are considering the following questions:

- Am I getting enough exercise at the moment?
- Would it be possible for me to change my exercise habits?
- Would increased exercise have a positive effect on my life?

The instructions and the visual appearance of the questionnaire are presented in Appendix A.

The messages were presented in a fixed order. The first three messages were ordered by ascending complexity. The following eight messages were presented in a random order (drawn from a uniform distribution).

5.3 Development of the questionnaire

Motivational messages. The perceived motivational effects of 11 messages were rated on an 11 point scale to emulate continuous responding. The scale ranged from 0 = “Not at all” to 10 = “Very much”. To ensure that the responses were measured on an interval scale, verbal descriptions of ratings were provided only for the endpoints of the scale. Due to technical limitations the verbal descriptions were presented with the instruction, before the actual scale. The respondents rated how much the messages would motivate them to start exercising regularly. The messages are presented in Table 4. The first message was based on information (“fact”) on the quantity of current exercise in the imagined setting. All consequent messages inherited this basic wording. The second message provided a fact-based rationale for exercise (“fact + rationale”). The first two messages were used as a standard for measurement. The third message provided a rationale based on the desired outcome of valued behaviour (“good life”). The eight additional messages represented the four motivational continuums in Schwartz value theory (conservation—openness, self-transcendence—self-enhancement, two questions for each domain). All values-based messages were created with the Portrait Values Questionnaire as a starting point (Schwartz et al., 2001). One message for each point was generated at first. After the questionnaire had been created and initially reviewed, one additional message for each domain was created.

Values. Deeply held personal values were measured using the Short Schwartz Value Survey (SSWS, Lindeman & Verkasalo, 2005). Respondents rated the personal importance of ten motivational domains of values on a 9 point scale (0 = “not at all” to 8 = “very important”). Verbal descriptions of the end points were provided with the instruction (one verbal description of a scale point from the SSVS had to be omitted for technical reasons). To prevent confounding from values ratings, the SSVS questionnaire was presented after the respondents had rated the motivational messages.

Exercise motivation. Respondents were asked to indicate their current level of exercise motivation on a dichotomous measure (“Is it generally easy for you to find the motivation for exercise”).

Willingness for values-work. A dichotomous measure was formed to identify which users reflected on the link between values and behaviour. This was used as a preliminary indicator for the respondent’s willingness for a values-based motivational approach. After responding to all other questions, the respondents were presented with the final question “Were you left reflecting on how values affect behaviour?”

Table 4

Messages Rated by the Respondents (Approximate Translation, see Appendix A for Original Wording)

| Coding | Message |
|-------------------|---|
| Fact ^a | Lately, you have been physically quite inactive. You could benefit from regular exercise. |
| Fact + Rationale | Regular exercise helps you manage better. |
| Good Life | Regular exercise gives you resources to live a good life. |
| Openness1 | Regular exercise helps you find forms of physical activity that you really enjoy and gives you more resources to live an active life. |
| Conservation1 | Regular exercise gives you resources to deal with your daily tasks and responsibilities. |
| Openness2 | Regular exercise gives you resources to things that you find interesting and be enthusiastic about new things. |
| Enhancement1 | Regular exercise helps you look energetic and in good form. |
| Transcendence1 | Regular exercise gives you resources to help others and care for the well-being of those that are important to you. |
| Transcendence2 | Regular exercise gives you resources to make ecological and ethical choices in your daily life. |
| Conservation2 | Regular exercise is part of the general recommendations for a healthy lifestyle and helps you stay fit and healthy |
| Enhancement2 | Regular exercise gives you resources to show your personal skills and respond to ambitious challenges. |

^a message was repeated in the beginning of all subsequent messages

5.4 Variable transformations

Transformed variables were computed for analysis of the data. All values were treated as measured on an interval scale, apart from the variables measured on a dichotomous scale. It was assumed that verbal descriptions at end points do not effect responding in a manner that would violate the assumption of equally spaced alternatives. All transformations and data analyses were performed using the PASW Statistics 18 (SPSS) software.

Messages. Messages were divided into intrinsic and extrinsic rationales (Deci & Ryan, 2000). Enhancement messages were classified as extrinsic and Transcendence and Openness messages as intrinsic.

It was presumed that the wording (rather than the values content) of some messages might affect how they are rated. To adjust for differences in the credibility of different messages, extreme values were used for analyses. Maximum and minimum values were computed for fact-based messages (fact, fact + rationale) and values-based messages respectively. For more detailed comparisons, maximum values for also computed for the motivational domains (Conservation—Openness to Change and Self-Transcendence—Self-Enhancement) and for intrinsic/extrinsic message content.

Values. Following advice from M. Verkasalo (Personal communication, November 10, 2010), all analyses of values orientation were performed using the two main motivational continuums (openness-conservation, self-enhancement-self-transcendence: Schwartz & Boehnke, 2004). Scores on the continuum were computed using the equations from (Lindeman & Verkasalo, 2005), with corrected constants (M. Verkasalo, personal communication, March 9, 2011).

$$\begin{aligned}
 \text{Conservation} = & -.62 + (.05 \times \text{Power}) + (.06 \times \text{Achievement}) - (.04 \times \text{Hedonism}) \\
 & - (.09 \times \text{Stimulation}) - (.18 \times \text{Self-Direction}) - (.16 \times \text{Universalism}) + \\
 & + (.03 \times \text{Benevolence}) + (.16 \times \text{Tradition}) + (.18 \times \text{Conformity}) \\
 & + (.11 \times \text{Security}).
 \end{aligned} \tag{1}$$

$$\begin{aligned}
 \text{Self-Transcendence} = & .70 - (.19 \times \text{Power}) - (.14 \times \text{Achievement}) - (.09 \times \text{Hedonism}) \\
 & - (.11 \times \text{Stimulation}) + (.01 \times \text{Self-Direction}) + (.10 \times \text{Universalism}) \\
 & + (.13 \times \text{Benevolence}) + (.07 \times \text{Tradition}) + (.06 \times \text{Conformity}) \\
 & + (.02 \times \text{Security}).
 \end{aligned} \tag{2}$$

These values were further classified into indicators for conservation/openness and self-transcendence/self-enhancement. Respondents with scores greater than zero on the conservation scale were classified in the conservation category and those with score less than zero in the openness category. Similarly, respondents with scores greater than zero on the self-transcendence scale were classified in the self-transcendence category and those with scores less than zero in the self-enhancement category.

5.5 Results

Preliminary analyses

35 percent of the respondents reported having trouble finding the motivation for exercise (low exercise motivation group). After filling the questionnaire, 32 percent of the respondents reported reflecting on the effect of values on behaviour. Those with low exercise motivation were less likely to do so than were those with normal exercise motivation (21% and 38% respectively). However, there number of respondents reporting low exercise motivation was relatively small.

The mean ratings of the motivational quality of the messages varied between 2.7 and 4.5 (Table 5). That is, overall, the messages were not considered very motivating. Providing a rationale did increase the motivational quality of a fact-based message ($M = 2.9$ for “fact” vs. $M = 4.0$ for “fact + rationale”).

Table 5

Message Ratings (n = 69)

| Message ^a | Range | Mean | Std. Deviation |
|----------------------|---------|------|----------------|
| 1 Fact | (0, 8) | 2.9 | 2.1 |
| 2 Fact + rationale | (0, 8) | 4.0 | 2.1 |
| 3 Good life | (0, 9) | 3.8 | 2.2 |
| 4 Openness1 | (0, 9) | 4.1 | 2.1 |
| 5 Openness2 | (0, 10) | 4.5 | 2.3 |
| 6 Transcendence1 | (0, 8) | 4.2 | 2.2 |
| 7 Transcendence2 | (0, 7) | 2.7 | 1.9 |
| 8 Conservation1 | (0, 8) | 3.6 | 2.2 |
| 9 Conservation2 | (0, 8) | 3.7 | 2.3 |
| 10 Enhancement1 | (0, 9) | 4.3 | 2.1 |
| 11 Enhancement2 | (0, 8) | 3.4 | 2.1 |

^a Messages have been reordered for clarity

Respondents with low exercise motivation found all messages less motivating than respondents with normal exercise motivation (Figure 5). There were some differences in the rank order of the messages. Respondents with low exercise motivation rated the demonstration of personal skills (Enhancement2) more motivating relative to other values-based messages than did those with normal exercise motivation. Preservation of personal health (Conservation2) was ranked second lowest among the eight values-based messages (fourth lowest by those with normal exercise motivation). However, all differences in the mean ratings were quite small.

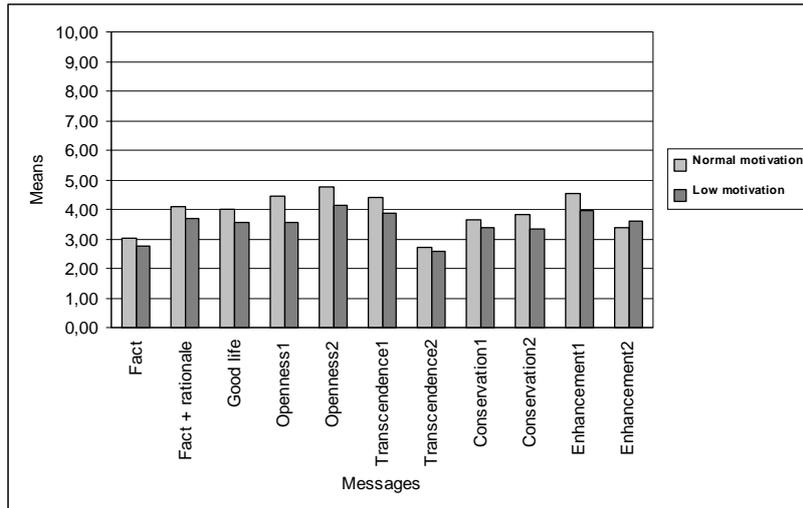


Figure 5. Means of Message Ratings by Motivation for Exercise.

The respondents who reported reflecting on the link between values and motivation gave (on average) higher ratings to almost all messages (Figure 6). Only ratings of dealing with daily responsibilities (Conservation1) did not differ between the two groups.

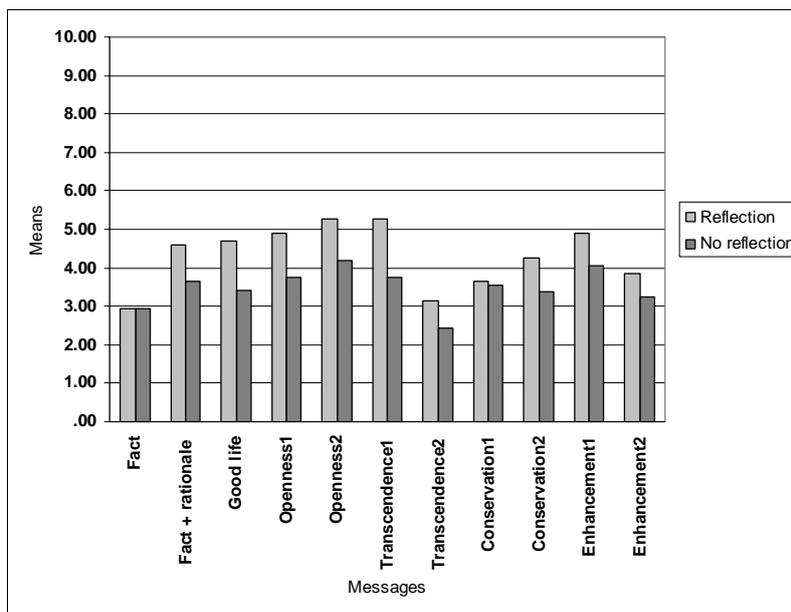


Figure 6. Means of Message Ratings by Reflection of the Effects of Values on Behaviour.

Mean ratings of values on the SWSS ranged from 2.9 to 6.6 (Table 6). On average, the respondents valued openness and self-transcendence ($M = -0.7$ for conservation and $M = 0.4$ for self-transcendence; Figure 7).

Table 6

Value Ratings from Short Schwartz's Value Survey

| Value | Range | Mean | Std. Deviation |
|----------------|--------|------|----------------|
| Power | (0, 6) | 2,9 | 1,9 |
| Achievement | (0, 8) | 5,1 | 1,6 |
| Hedonism | (1, 8) | 5,9 | 1,5 |
| Stimulation | (1, 8) | 4,9 | 1,7 |
| Self-Direction | (0, 8) | 6,2 | 1,7 |
| Universalism | (1, 8) | 5,4 | 2,0 |
| Benevolence | (2, 8) | 6,6 | 1,5 |
| Tradition | (0, 7) | 3,1 | 1,9 |
| Conformity | (0, 8) | 4,2 | 1,8 |
| Security | (2, 8) | 5,8 | 1,5 |

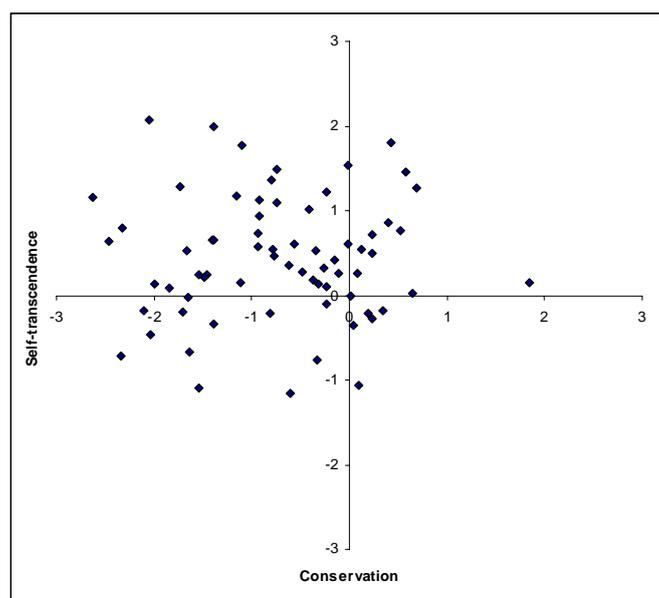


Figure 7. Respondents' Scores on Conservation and Self-Transcendence Scales.

Primary analyses

To examine research questions 1, 2, and 4, the maximum (minimum, where necessary) mean ratings of different message types were compared. For research question 3, the match between values orientation and the highest rated values-messages was examined. Comparisons were formed for the Conservation—Openness and Self-Transcendence—Self-enhancement continuums respectively, and cross-tabulation was used for the descriptive analyses.

Question 1a: The Most Motivating Values-Message vs. the Most Motivating Fact-Message.

Overall, half of the values-based messages were rated more motivating than the best fact-based message (Table 5). On the individual level, approximately three out of four respondents found their preferred values-based message *more motivating* than either of the fact-based messages (Table 7). For those respondents the average difference between the most motivating values-based and fact-based messages was $M = 2.1$ with $SD = 1.2$, and the median number of values-based messages rated higher than fact-based messages was $Mdn = 3$.

Table 7

Distribution of the Differences in Ratings (Most Motivating Values Message vs. Most Motivating Fact Message)

| Difference | Frequency | Percentage | Cumulative Percentage |
|------------|-----------|------------|-----------------------|
| -1.00 | 6 | 8.7 | 8.7 |
| .00 | 10 | 14.5 | 23.2 |
| 1.00 | 21 | 30.4 | 53.6 |
| 2.00 | 19 | 27.5 | 81.2 |
| 3.00 | 6 | 8.7 | 89.9 |
| 4.00 | 2 | 2.9 | 92.8 |
| 5.00 | 5 | 7.2 | 100.0 |
| Total | 69 | 100.0 | |

Question 1b: The Least Motivating Values-Message vs. the Least Motivating Fact-Message.

Generally, only one of the values-based messages was found to be less motivating than either of the fact-based messages (Table 5). On the individual level, more than half of the respondents found at least one values-based message *less motivating* than either of the fact-based messages (Table 8). For those respondents the average difference between the least motivating values-based and fact-based messages was $M = -1.8$ with $SD = 1.2$. The median number of values-based messages rated less motivating than the fact-based messages was $Mdn = 2.5$.

The data indicates that most respondents found some of the values-based messages more motivating than the fact-based messages and some less motivating. Only ten percent of the respondents preferred most (a total of six or more) of the values based messages to the fact-based messages. Six percent rated more than five of the values-based messages less motivating than the fact-based messages.

Table 8

Distribution of the Differences in Ratings (Least Motivating Values Message vs. Least Motivating Fact Message)

| Difference | Frequency | Percentage | Cumulative Percentage |
|------------|-----------|------------|-----------------------|
| -5.00 | 2 | 2.9 | 2.9 |
| -4.00 | 3 | 4.3 | 7.2 |
| -3.00 | 2 | 2.9 | 10.1 |
| -2.00 | 10 | 14.5 | 24.6 |
| -1.00 | 21 | 30.4 | 55.1 |
| .00 | 15 | 21.7 | 76.8 |
| 1.00 | 12 | 17.4 | 94.2 |
| 2.00 | 3 | 4.3 | 98.6 |
| 3.00 | 1 | 1.4 | 100.0 |
| Total | 69 | 100.0 | |

Question 2: The Most Motivating Values-Message vs. “Good Life”. Overall, four values-based messages were rated more motivating than “Good Life” (Table 5). Regarding the individual responses, four out of five respondents found their preferred values-based message *more motivating* than “Good Life” (Table 9). For those respondents the mean difference between highest rated values-based message and “Good Life” was $M = 2.1$ with $SD = 1.2$. The median number of values based messages rated more motivating than ‘Good Life’ was $Mdn = 4$.

Table 9

Distribution of the Differences in Ratings (The Most Motivating Values Message vs. ‘Good Life’)

| Difference | Frequency | Percentage | Cumulative Percentage |
|------------|-----------|------------|-----------------------|
| -1.00 | 1 | 1.4 | 1.4 |
| .00 | 11 | 15.9 | 17.4 |
| 1.00 | 23 | 33.3 | 50.7 |
| 2.00 | 16 | 23.2 | 73.9 |
| 3.00 | 10 | 14.5 | 88.4 |
| 4.00 | 6 | 8.7 | 97.1 |
| 5.00 | 2 | 2.9 | 100.0 |
| Total | 69 | 100.0 | |

Question 3: The Match Between the Most Motivating Values-Messages and Values Orientation. The Conservation—Openness dimension was examined first. Overall, there was only a partial match between preferred message content and values orientation. On average, respondents oriented towards Openness rated related messages more motivating than did respondents oriented towards

Conservation, and vice versa (Table 10). However, the differences were quite small and not significant (overlapping 95% CI's). There was a match between being oriented towards Openness and preferred message content. However, for respondents oriented towards Conservation the highest rated message did not match their orientation. Additionally, the second Openness related message was also rated as motivating as both Conservation messages. On the individual level there was no match between values orientation on the Conservation—Openness continuum and highest rated message content (Table 11). Regardless of values orientation, a majority of respondents preferred one of the Openness themed messages.

Table 10

Values orientation on the Openness – Conservation dimension and mean message ratings

| Message | Values Category ^a | Mean | Std. Error of Mean | 95% Confidence Interval for Mean |
|---------------|------------------------------|------|--------------------|----------------------------------|
| Openness1 | Openness | 4.2 | 0.3 | (3.6, 4.8) |
| | Conservation | 4.0 | 0.6 | (2.8, 5.2) |
| Openness2 | Openness | 4.6 | 0.3 | (4.0, 5.2) |
| | Conservation | 4.3 | 0.6 | (3.0, 5.6) |
| Conservation1 | Openness | 3.4 | 0.3 | (2.9, 4.0) |
| | Conservation | 3.9 | 0.6 | (2.6, 5.3) |
| Conservation2 | Openness | 3.6 | 0.3 | (2.9, 4.2) |
| | Conservation | 4.0 | 0.5 | (2.9, 5.1) |

^a Openness: *n* = 52, Conservation: *n* = 17

Next, orientation on the Self-Enhancement—Self-Transcendence dimension was examined. On average, there was a partial match between values orientation and message ratings. Respondents oriented towards Self-Enhancement on the SSWS rated gave higher ratings to both Self-Enhancement related messages and one Self-Transcendence themed message than did respondents oriented towards Self-Transcendence (Table 12). The differences were small, with overlapping 95% CI's.

Table 11

Distribution of Highest Rated Message Content by Values Orientation (%)

| Highest Rated Message | Values Orientation | | | |
|-----------------------|--------------------|--------------|-------------|---------------|
| | Openness | Conservation | Enhancement | Transcendence |
| Openness | 81 | 71 | - | - |
| Conservation | 19 | 29 | - | - |
| Enhancement | - | - | 78 | 69 |
| Transcendence | - | - | 22 | 31 |
| Total | 100 | 100 | 100 | 100 |

Overall, respondents oriented towards Self-Enhancement found a matching message the most motivating, as did respondents oriented towards Self-Transcendence. However, for the latter group one Self-Enhancement message was rated equally motivating.

For individual respondents the content of their highest rated message could not be predicted from their values orientation as, regardless of orientation, the majority of respondents preferred a Self-Enhancement themed message (Table 11).

Question 4: The Most Motivating Extrinsic Message vs. the Most Motivating Intrinsic Message. On average, one intrinsic message was rated more motivating than the best extrinsic message, and another equally motivating (Table 5). One half of the respondents found extrinsic messages *less motivating* than the most motivating intrinsic message (Table 13). For those respondents the mean difference between the most motivating intrinsic and extrinsic message ratings was $M = 1.6$ with $SD = 1.0$. The median number of intrinsic messages rated higher than any of the extrinsic messages was $Mdn = 1$. Thus, there was no conclusive evidence that extrinsic message content is less motivating than intrinsic message content.

Table 12

Values orientation on the Self-enhancement – Self-transcendence dimension and mean message ratings

| Message | Values Category ^a | Mean | Std. Error of Mean | 95% Confidence Interval for Mean |
|----------------|------------------------------|------|--------------------|----------------------------------|
| | Enhancement | 4.7 | 0.6 | (3.5, 5.8) |
| Enhancement1 | Transcendence | 4.2 | 0.3 | (3.6, 4.8) |
| | Enhancement | 3.8 | 0.5 | (2.7, 4.8) |
| Enhancement2 | Transcendence | 3.3 | 0.3 | (2.7, 3.9) |
| | Enhancement | 4.1 | 0.5 | (2.9, 5.2) |
| Transcendence1 | Transcendence | 4.3 | 0.3 | (3.7, 4.9) |
| | Enhancement | 2.8 | 0.5 | (1.8, 3.8) |
| Transcendence2 | Transcendence | 2.6 | 0.3 | (2.1, 3.2) |

^a Self-Enhancement: $n = 18$, Self-Transcendence: $n = 51$

Table 13

Distribution of Differences in Ratings (The Most Motivating Extrinsic Message vs. The Most Motivating Intrinsic Message)

| Difference | Frequency | Percentage | Cumulative Percentage |
|------------|-----------|------------|-----------------------|
| -5.00 | 1 | 1.4 | 1.4 |
| -4.00 | 1 | 1.4 | 2.9 |
| -3.00 | 4 | 5.8 | 8.7 |
| -2.00 | 6 | 8.7 | 17.4 |
| -1.00 | 22 | 31.9 | 49.3 |
| .00 | 20 | 29.0 | 78.3 |
| 1.00 | 14 | 20.3 | 98.6 |
| 3.00 | 1 | 1.4 | 100.0 |
| Total | 69 | 100.0 | |

6 Discussion

The purpose of this thesis was to gather ideas, theories and research that can later be used to develop computerized health interventions that take into consideration the users' personal values. There is a growing need for new citizen-centred solutions for prevention and health care. However, it is all too easy to tell users what they should be doing and to disregard what they would wish to be doing. A values approach could help to integrate the goals of increasing healthy behaviours and increasing subjective well-being and happiness in life.

The link between values and motivation has not been widely studied, although some research has emerged in the past few years (Parks & Guay, 2009; Plumb et al., 2009). However, thus far, the use of values for motivating behaviour has been relatively unestablished. As a result, this thesis is an exploration of the possible avenues arising from the literature.

Mapping the literature on values and motivation was a complicated task. There appear to be no thorough previous discussions on different methods to encourage and motivate for behaviour, using personal values. Additionally, very few articles provided any definitions for the concepts they used. Concepts such as values, attitudes, goals, and aspirations were often used roughly synonymously. In a sense this is predictable; values, like many other concepts in psychology (such as personality), are not tangible. Values can only be implicitly observed through behaviour. Thus for the purpose of supporting motivation, any construct that describes something personally meaningful and motivational could be useful.

Regardless of the nuances in various definitions, values could be thought of as a concept for describing a process: the process of judging some outcome preferable to others in the long term and directing behaviour accordingly (Bilsky & Schwartz, 1994; Hayes et al., 1999). It could be argued that this approach would leave out some important aspects of valuing, such as preferring but not acting accordingly. However, valuing is a verbal construct, not an entity. Omitting something from the definition is not like leaving out 'tail' from the definition of a cat. Besides, 'a tailless cat' makes perfect sense. So does valuing but not acting accordingly. Thus, it would seem both useful and plausible to come up with a catch-all definition for valuing.

Because valuing (like the concept of health) is verbally constructed and taught by the verbal community it should have roughly the same meaning for everyone. If valuing is considered to be related to valences (Feather, 1995), then it seems reasonable to assume that for most people values mean something positive and can evoke action. On the basis of this literature review it appears that

regardless of technical definitions, the basic meaning of valuing should be easily understood, making values a plausible means for supporting motivation.

However, an important consideration is how to validly measure personal values. As with any sensitive issues, there is always the risk of sociably desirable responding. It may also be that the individual holds double standards, expecting different behaviour from other than what is personally preferable. Another problem regarding values assessment is to determine a suitable level of abstraction. As will be discussed below with regard to empirical results, vague descriptions of values might not catch what moves the individual to act. In addition, not knowing personal values in enough detail might lead to strategies for motivating that feel neither meaningful nor personal to the individual. On the other extreme, the knowledge of personal values could be so detailed that it cannot be fully processed by any computerized means. This approach would direct towards active values work but disable any less conscious strategies for motivating through values. Based on these results it is crucial to find if values can be measured in a manner that is detailed enough to allow for tailoring based on values, whilst still catching the essence of what the user truly values.

If problems regarding assessment can be overcome, values could allow for a meaningful, personal and, above all, positive means for motivating in computerized health interventions. Motivation for healthy behaviour could be garnered from what the individual truly wants rather than from the wish to avoid some negative health outcome. Such an approach is novel in computerized health interventions and, to my knowledge, has not been used before.

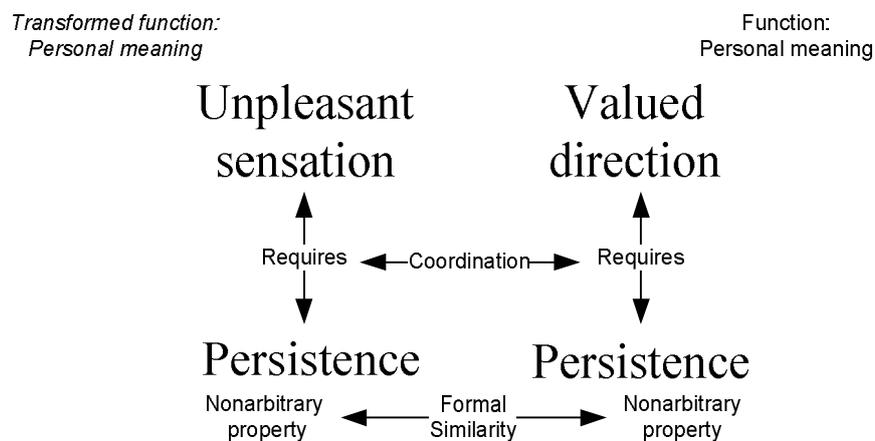
Additionally, the values work in ACT emphasizes that valuing consists of continuously choosing the valued behaviour (Hayes et al., 1999). Teaching such attitude towards both valued behaviour and health behaviour could reduce stress about setbacks and increase feelings of competence, thus supporting perseverance. This could help to bring a sense of the therapeutic alliance into computerized interventions, as the user is not only encouraged to behave in a certain manner but also reassured that struggling in doing so is a natural part of the process.

First of the two main ideas giving rise to this thesis was the possibility of using values for tailoring or otherwise in an indirect way. Needs support in the form of a meaningful rationale (Deci & Ryan, 2000) could be one such possibility. The effects here could be two-fold. First, personal values could form the basis for a credible rationale. Second, the rationale (in addition to other support for the basic psychological needs) could promote the integration of values related to health behaviour. However, in light of some of the SDT research (Vansteenkiste et al., 2004) it could be that only intrinsic values should be used for motivating others. From the functional perspective it could be stated that any rationale should be used only if it brings about beneficial consequences, irrespective of their intrinsic or extrinsic character. Thus, it could be of consequence to give the user

the opportunity to periodically assess whether the valued goals they have set for themselves actually motivate behavioural change and whether the right goals have been chosen.

Relational frame theory posits that humans are verbal beings that continuously engage in verbal behaviour, or relational framing (Hayes et al., 1999; Hayes et al., 2001). However, for the most part this goes on unnoticed. The way to alter relational frames and (and the psychological function of the existing stimuli) is by adding new stimuli. In this light it seems plausible that relating behaviour to something personally meaningful can make the behaviour feel more meaningful as well. Thus, linking health behaviour to something of extreme personal meaning, that is, personal values or the goal of leading a good life, can lead to changes in the way health behaviour is perceived.

Studies of analogous framing (Branstetter-Rost et al., 2009; Páez-Blarrina et al., 2008) in ACT could provide the basis for another similar approach. In RFT it is thought that learning about relations between relations is the most powerful type of verbal learning. However, these studies seem to be based on metaphorical rather than analogous framing, in that the formal similarity between persistence for values and persistence with unpleasant sensations is emphasized (see diagram below).



Metaphorical framing of values and health behaviour might thus have an effect on the motivation for health behaviour. However, the ACT studies on analogous framing have been based on a procedure of conscious deliberation on the ways values induce persistence. It might be that for relational framing a less direct approach would not work, as the active choice in valuing is thought to be at a central mechanism in ACT (Dahl et al., 2009).

For this purpose, the second approach considered for this thesis was increasing motivation through active values work. The aim of ACT interventions is to increase the individual's awareness of their personal values and the ways to overcome obstacles on valued directions (Dahl et al., 2009). Persisting with positive lifestyle changes could be one such obstacle, as health can be perceived as a

prerequisite for or component of other values (Allicock et al., 2008). Bringing health behaviour into the motivational context of values could reduce the likelihood of the behaviour being regulated by feelings of coercion or guilt. That is, simply thinking about health in the context of personal values could lead to subtle changes in the way that users perceive their lifestyle choices. This change in context could lead to increased willingness for behavioural change.

It is important to note that the aim of all ACT interventions is to increase psychological flexibility (Hayes et al., 1999). If values are to be used in personal health applications great care must be taken not to induce rigid rule-following. Both SDT and ACT describe similar harmful behaviour control (the different forms of extrinsic motivation, and rule-following). These findings have direct consequences for designing a computerized health intervention: Whatever approach is chosen, any instructions given to the user should be formulated so as not to have a negative effect on the feelings of autonomy, competence or relatedness. For instance, linking values and motivation in a way that leads to the individual trying to please others (i.e. *pliance*), is likely to be harmful to autonomy, and thus reduce the quality of motivation.

A very promising finding in this literature review was that in addition to their possible uses in motivating others, there are beneficial consequences of valued behaviour *per se*. In Acceptance and Commitment Therapy values clarification and persistence in valued behaviour are methods and also desirable outcomes (Dahl et al., 2009; Hayes et al., 1999). Values work is beneficial for psychological well-being because it increases psychological flexibility. Expecting to attain valued goals is also linked to happiness (Deci & Ryan, 2001). However, values-congruent behaviour has been shown to increase physical well-being as well (Plumb et al., 2009). Thus, an intervention based on values could be used, perhaps as a starting point. If the users can first see the beneficial effects pursuing valued goals, it could then be easier to help them set health-related goals as well.

In SDT the pursuit of certain values are thought to be linked to psychological well-being, in that they promote the fulfilment of the basic psychological needs (Deci & Ryan, 2000). However, some values are thought to have detrimental effects on well-being. There is no conflict between the SDT and RFT with respect to this, as the external values are described as socially conditioned reinforcers (not values) in ACT (Dahl et al., 2009). In the contextual framework their effects on well-being are thought to depend on their functional meaning (i.e. whether they are goals in and of themselves or means in the pursuit of valued goals).

On the other hand, providing support for the basic psychological needs of autonomy, competence and relatedness could be an important goal in itself. It should be quite simple to integrate such support mechanisms into computerized interventions. This could be done, for instance, by formulating feedback and other communication with the users so that the users feel that

they are acting of their own choice, that their conflicting feelings are acknowledged and that they are given a personally meaningful reason for trying out the recommendations given in the programme.

Exploring and resolving ambivalence is also a central method for behaviour change in motivational interviewing (Hettema, Steele, & Miller, 2005). In their meta-analysis, Hettema et al. (2005) list the following components in motivational interviewing: being collaborative, being client centred, being nonjudgmental, building trust, reducing resistance, increasing readiness to change, increasing self-efficacy, increasing perceived discrepancy, engaging in reflective listening, eliciting change talk, exploring ambivalence, and listening empathically. As motivational interviewing can sometimes be very effective in changing health behaviour, it would be beneficial to consider if some of these methods could be transformed to be used in technology-based health interventions.

Some of the values approaches discussed here could be considered for other application areas, such as e-learning. However, health behaviour interventions in particular provide a natural place to examine the possibilities of promoting motivation through personal values. Health is in itself often considered the central valued goal (Allicock et al., 2008), and as such it should be a sensible companion to personal values. Especially as values-congruent behaviour alone can lead to positive changes in well-being, happiness, health, and health behaviours.

Although this literature review revealed some promising ideas arising from the literature, further research is needed to establish the feasibility of a values approach in computerized health interventions. A small pilot study was designed to examine the motivational effects of values-based messages. As the main focus in this thesis was on the literature review, the study was designed to be a preliminary, descriptive exploration.

Respondents in the study found some feedback based on values more motivating than basic feedback based on recent (hypothetical) behaviour. However, importantly, some values-based feedback was considered to be less motivating than the basic feedback. This appears to validate the idea that it is necessary to know the users' personal values when constructing a rationale for behaviour. A rationale may appear to be "valuable" by some objective standard, but it should also be personally valued. These findings indicate that messages based on values could provide increases in motivation, but also that great care must be taken to ensure that the values truly are endorsed by the individual.

The overall motivational effect of all the messages was quite low. Several respondents chose to comment on the survey, stating that they disliked being given negative feedback and behavioural recommendations (Appendix B). Thus, it is likely that the wording of the feedback violated the respondents' feelings of autonomy and competence. The messages in this study were designed to

incorporate the values-approach but also to otherwise resemble what is currently done in such applications. For future consideration it is important to take into consideration the negative reactions to what had been considered in the design phase only mildly negative feedback.

Self-determination theory promotes providing a meaningful rationale as a means to motivating others (Ryan & Deci, 2000). However, the participants in the studies reviewed here were not given a personal rationale for the task (Table 2). In this study, some respondents reported rating the messages based on their credibility rather than values content (Appendix B). The lack of tailoring was a shortcoming in this study. The message content had to be formulated so as to be suitable for all respondents. This inevitably led to the messages being ambiguous and, perhaps, personally irrelevant. In light of the findings from this study it must be emphasized that if values are to be used in health care applications, the rationales based on them need to have face-value.

Based on the broad motivational continuums from the Schwartz value theory (Schwartz & Bilsky, 1990), personal values orientation did not affect what message content the respondents found the most motivating. There was some indication that the overall ratings of different messages were related to values orientation. This seems to indicate that there could be a general match between how different messages are received. However, the results from this study indicate that knowing the user's personal values might not be sufficient for finding the message content that they find the most motivating. Thus, based on this pilot study, it would be necessary to examine the effects of values in addition to other tailoring variables with more messages in a more realistic setting. Additionally, the required level of detail in values assessment needs to be considered, as it might be that the broad motivational domains considered here were not specific enough to catch what truly motivated the individuals.

There are at least two possible explanations to why a majority of respondents were motivated by the openness to change and self-enhancement rationales. Either these values truly were more motivating, or the rationales based on them seemed more credible. It could be that it simply is easier to formulate motivating messages based on some values content than on others. In any case, it is clear that formulating credible values-based messages without detailed knowledge of the user's values poses a challenge that needs to be solved before values can be effectively used for tailoring.

No negative effect from extrinsic message content on motivation could be demonstrated in this study. However, this study did not measure motivation through behavioural measures. A self-report measure on the perceived motivational quality of messages might not catch the effects on the quality of motivations, had the messages been presented in a realistic setting. As both SDT and ACT indicate that extrinsic content might not have optimal motivational consequences, it is

important to further examine this effect if the values approach is utilized in a computerized intervention.

Another consideration regarding the pilot study is the use of a health rationale to represent the conservation values. In the Schwartz value theory health is not included in the ten motivational domains (Sagiv & Schwartz, 2000; Schwartz & Boehnke, 2004; Stewart & Barnes-Holmes, 2001). It was considered that such a rationale could be used here, as the interest lay in studying the motivational effects on health behaviour. The rationale was formulated to reflect adherence to guidelines and the aspiration of physical safety. Whether the respondents assessed the rationale as intended could not be verified.

The values questionnaire was presented after the rationales to avoid confounding the ratings. It is still possible that considering the motivational quality of the values-based messages affected the ratings of personal values. Some of the feedback from the respondents (Appendix B) indicated that they had tried to give congruent ratings to the motivation messages and the values questionnaire.

Although the pilot study could not be very detailed, it did confirm some of the basic ideas arising from the literature. However, it did also bring to light many important considerations for motivating behavioural change using values. As no previous studies on the topic could be found, the results of this study need to be further examined if values are to be used in computerized health interventions. Such research would be welcome, as a values-approach could bring more meaning into any health intervention.

Conclusions

Two theoretically different approaches to motivation through personal values could be found. The SDT approach presents the pursuit of valued goals as a means to the fulfilment of psychological needs. The suggested approach could be framed as: 'Find more meaning in what you're doing and be motivated by that'. The ACT on the other hand is more focused on valued behaviour as the desired outcome, suggesting: 'Be motivated to do more of what you find meaningful'.

Based on the literature and the two theories discussed here the following guidelines for motivating through values could be formed: First, the goal in any health intervention should be to make the health behaviour more personally meaningful. That is, health should become integrated into the personal value system of the user (p. 30 in this thesis). Motivation could also be increased by finding a personally relevant connection between valued goals and healthy behaviour (p. 31). Second, techniques to acknowledge the needs for autonomy, relatedness and competence should be used (p. 33). Such techniques can include acknowledging ambivalence and providing a meaningful rationale for behaviour change (pp. 18–20). Third, values are both highly personal and personally

meaningful (p. 9) and could form a basis for the rationale. Finally, only such value statements that have been shown to be beneficial for motivation and well-being should be used (pp. 27–28, 33–34, and 56). Results from the pilot study indicate that personal values could be a feasible means for increasing motivation for health behaviour change. However, further research is needed to determine how to ensure that values-based communication in computerized health interventions captures what is truly meaningful and motivating to the individual user.

Health is a complex construct that affects the whole of human functioning. Thus, there is an infinite range of different activities that affect health and are affected by health. Values, like health, can affect behaviour in all domains in life. Because they are ultimately the most personal of all motivations, they can help to bring personal meaning into health behaviours. However, most importantly, values could help the individual see beyond health guidelines and recommendations and to consider health in relation to the broad idea of authentic, personal well-being. Discovering feasible ways to promote health through personally meaningful valued behaviour holds great potential for increasing both mental and physical health and well-being.

References

- Allcock, M., Sandelowski, M., DeVellis, B., & Campbell, M. (2008). Variations in meanings of the personal core value "health". *Patient Education and Counseling*, *73*, 347–353.
- Barak, A., Hen, L., Boniel-Nissim, M., & Shapira, N. (2008). A comprehensive review and a meta-analysis of the effectiveness of internet-based psychotherapeutic interventions. *Journal of Technology in Human Services*, *26*, 109–160.
- Bardi, A., & Schwartz, S. H. (2003). Values and behavior: Strength and structure of relations. *Personality and Social Psychology Bulletin*, *29*, 1207–1220.
- Barnes-Holmes, Y., Barnes-Holmes, D., McHugh, L., & Hayes, S. C. (2004). Relational frame theory: Some implications for understanding and treating human psychopathology. *International Journal of Psychology & Psychological Therapy*, *4*, 355–375.
- Bernstein, D. J. (1990). Of sticks and carrots: A review of Deci and Ryan's intrinsic motivation and self-determination in human behavior. *Journal of the Experimental Analysis of Behavior*, *54*, 323–332.
- Bilsky, W. (1998). Values and motives. Paper presented at the International Research Workshop "Values: Psychological Structure, Behavioral Outcomes, and Inter-Generational Outcomes", Maale-Hachamisha, Israel.
- Bilsky, W., & Schwartz, S. H. (1994). Values and personality. *European Journal of Personality*, *8*, 163–181.
- Bilsky, W., & Schwartz, S. H. (2008). Measuring motivations: Integrating content and method. *Personality and Individual Differences*, *44*, 1738–1751.
- Blackledge, J. T. (2003). An introduction to relational frame theory: Basics and applications. *The Behavior Analyst Today*, *3*, 421–433.
- Branstetter-Rost, A., Christopher, C., & Douleh, T. (2009). Personal values and pain tolerance: Does a values intervention add to acceptance? *The Journal of Pain*, *10*, 887–892.
- Brown, K. W., & Ryan, R. M. (2004). Fostering healthy self-regulation from within and without: A self-determination theory perspective. In: P. A. Linley, & S. Joseph (Eds.), *Positive psychology in practice*. (pp. 105–124). Hoboken, NJ, US: Wiley.
- Buck, R. (1988). *Human motivation and emotion* (2nd ed.). New York: Wiley.
- Ciarrochi, J., Robb, H., & Godsell, C. (2005). Letting a little nonverbal air into the room: Insights from Acceptance and Commitment Therapy: Part 1: Philosophical and theoretical underpinnings. *Journal of Rational-Emotive & Cognitive Behavior Therapy*, *23*, 79–106.
- Dahl, J., Plumb, J. C., Stewart, I., & Lundgren, T. (2009). *The art & science of valuing in psychotherapy : Helping clients discover, explore, and commit to valued action using Acceptance and Commitment Therapy*. Oakland, CA: New Harbinger Publications.
- Deci, E. L., & Ryan, R. M. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141–166.
- Deci, E. L., Eghrari, H., Patrick, B. C., & Leone, D. R. (1994). Facilitating internalization: The self-determination theory perspective. *Journal of Personality*, *62*, 119–142.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.

- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227–268.
- Fagerström, A. (2007). The impact of verbal stimuli in motivating consumer response at the point of purchase situation online. In: M. J. Smith, G. Salvendy (Eds.). (2007). *Human Interface, Part II, HCII 2007, LNCS 4558* (pp. 713–719). Berlin, Heidelberg: Springer-Verlag.
- Feather, N. T. (1995). Values, valences, and choice: The influences of values on the perceived attractiveness and choice of alternatives. *Journal of Personality and Social Psychology*, *68*, 1135–1151.
- Fletcher, L., & Hayes, S. C. (2005). Relational frame theory, Acceptance and commitment therapy, and a functional analytic definition of mindfulness. *Journal of Rational-Emotive & Cognitive Behavior Therapy*, *23*, 315–336.
- Forman, E. M., Butryn, M. L., Hoffman, K. L., & Herbert, J. D. (2009). An open trial of an acceptance-based behavioral intervention for weight loss. *Cognitive and Behavioral Practice*, *16*, 223–235.
- Grouzet, F. M. E., Kasser, T., Ahuvia, Aaron Fernández Dols, José Miguel, Kim, Y., Lau, S., Ryan, R. M., Sheldon, K. M. (2005). The structure of goal contents across 15 cultures. *Journal of Personality and Social Psychology*, *89*, 800–816.
- Hayes, S. C. (2004). Acceptance and commitment therapy, relational frame theory, and the third wave of behavioral and cognitive therapies. *Behavior Therapy*, *35*, 639–665.
- Hayes, S. C., Barnes-Holmes, D., & Roche, B. (Eds.). (2001). *Relational frame theory: A post-skinnerian account of human language and cognition*. New York: Plenum Press.
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy*, *44*, 1–25.
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford Press.
- Hayes, S. C., & Wilson, K. G. (1994). Acceptance and commitment therapy: Altering the verbal support for experiential avoidance. *The Behavior Analyst*, *17*, 289–303.
- Heffner, M., Eifert, G. H., Parker, B. T., Hernandez, D. H., & Sperry, J. A. (2003). Valued directions: Acceptance and commitment therapy in the treatment of alcohol dependence. *Cognitive and Behavioral Practice*, *10*, 378–383.
- Hettema, J., Steele, J., & Miller, W. R. (2005). Motivational interviewing. *Annual Review of Clinical Psychology*, *1*, 91–111.
- Jang, H. (2008). Supporting students’ motivation, engagement, and learning during an uninteresting activity. *Journal of Educational Psychology*, *100*, 798–811.
- Jolibert, A., & Baumgartner, G. (1997). Values, motivations and personal goals: Revisited. *Psychology & Marketing*, *14*, 675–688.
- Kanter, J. W., Manos, R. C., Bowe, W. M., Baruch, D. E., Busch, A. M., & Rusch, L. C. (2010). What is behavioral activation? A review of the empirical literature. *Clinical Psychology Review*, *30*, 608–620.
- Kasser, T. (2002). Sketches for a self-determination theory of values. In: E. L. Deci, & R. M. Ryan (Eds.), *Handbook of self-determination research*. (pp. 123–140). Rochester, NY: University of Rochester Press.
- Kasser, T., & Ryan, R. M. (1993). A dark side of the American dream: Correlates of financial success as a central life aspiration. *Journal of Personality and Social Psychology*, *65*, 410–422.

- Kleinginna, P. R., & Kleinginna, A. M. (1981). A categorized list of motivation definitions, with a suggestion for a consensual definition. *Motivation and Emotion, 5*, 263–291.
- Laraway, S., Snyckerski, S., Michael, J., & Poling, A. (2003). Motivating operations and terms to describe them: Some further refinements. *Journal of Applied Behaviour Analysis, 36*, 407–414.
- Lim, B. S. C., & Wang, C. K. J. (2009). Perceived autonomy support, behavioural regulations in physical education and physical activity intention. *Psychology of Sport and Exercise, 10*, 52–60.
- Lindeman, M., & Verkasalo, M. (2005). Measuring values with the short Schwartz's value survey. *Journal of Personality Assessment, 85*, 170–178.
- Lipkens, R., & Hayes, S. C. (2009). Producing and recognizing analogical relations. *Journal of the Experimental Analysis of Behavior, 91*, 105–126.
- Luciano Soriano, C., Rodríguez Valverde, M., & Gutiérrez Martínez, O. (2004). A proposal for synthesizing verbal contexts in experiential avoidance disorder and Acceptance and Commitment Therapy. *International Journal of Psychology and Psychological Therapy, 4*, 377–394.
- Luciano, C., Valdivia-Salas, S., Cabello-Luque, F., & Hernandez, M. (2009). Developing self-directed rules. In: R. A. Rehfeldt, & Y. Barnes-Holmes (Eds.), *Derived relational responding* (pp. 335–352). Oakland, CA: New Harbinger Publications.
- Lundgren, T., Dahl, J., & Hayes, S. C. (2008). Evaluation of mediators of change in the treatment of epilepsy with acceptance and commitment therapy. *Journal of Behavioral Medicine, 31*, 225–235.
- Lustria, M. L. A., Cortese, J., Noar, S. M., & Glueckauf, R. L. (2009). Computer-tailored health interventions delivered over the web: Review and analysis of key components. *Patient Education and Counseling, 74*, 156–173.
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*, 370–396.
- McClelland, D. C., Koestner, R., & Weinberg, J. (1989). How do self-attributed and implicit motives differ? *Psychological Review, 96*, 690–702.
- McHoskey, J. W. (1999). Machiavellianism, intrinsic versus extrinsic goals, and social interest: A self-determination theory analysis. *Motivation & Emotion, 23*, 267–283.
- McHugh, L., Barnes-Holmes, Y., & Barnes-Holmes, D. (2004). A relational frame account of the development of complex cognitive phenomena: Perspective-taking, false belief understanding, and deception. *International Journal of Psychology & Psychological Therapy, 4*, 303–324.
- Michael, J. (1993). Establishing operations. *The Behavior Analyst, 16*, 191–206.
- Miller, W. R., C'de Baca, J., Matthews, D. B. & Wilbourne, P. L. (2001). *Personal values card sort*. Retrieved October 20, 2010, from <http://motivationalinterview.org/library/valuescardsort.pdf>, <http://motivationalinterview.org/library/valuesinstructions.pdf>.
- Noar, S. M., Benac, C. N., & Harris, M. S. (2007). Does tailoring matter? Meta-analytic review of tailored print health behavior change interventions. *Psychological Bulletin, 133*, 673–693.
- Olson, R., Laraway, S., & Austin, J. (2001). Unconditioned and conditioned establishing operations in organizational behavior management. *Journal of Organizational Behavior Management, 21*, 7–35.
- Páez-Blarrina, M., Luciano, C., Gutiérrez-Martínez, O., Valdivia, S., Ortegad, J., & Rodríguez-Valverde, M. (2008). The role of values with personal examples in altering the functions of pain: Comparison between acceptance-based and cognitive-control-based protocols. *Behaviour Research and Therapy, 46*, 84–97.

- Parks, L., & Guay, R. P. (2009). Personality, values, and motivation. *Personality and Individual Differences, 47*, 675–684.
- Plumb, J. C., Stewart, I., Dahl, J., & Lundgren, T. (2009). In search of meaning: Values in modern clinical behavior analysis. *The Behavior Analyst, 32*, 85–103.
- Portnoy, D. B., Scott-Sheldon, L. A. J., Johnson, B. T., & Carey, M. P. (2008). Computer-delivered interventions for health promotion and behavioral risk reduction: A meta-analysis of 75 randomized controlled trials, 1988–2007. *Preventive Medicine, 47*, 3–16.
- Ramnerö, J., & Törneke, N. (2008). *The ABCs of human behavior*. Oakland, CA: New Harbinger Publications.
- Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004). Enhancing students' engagement by increasing teachers' autonomy support. *Motivation and Emotion, 28*, 147–169.
- Reeve, J., Jang, H., Hardre, P., & Omura, M. (2002). Providing a rationale in an autonomy-supportive way as a strategy to motivate others during an uninteresting activity. *Motivation and Emotion, 26*, 183–207.
- Robb, H. (2007). Values as leading principles in acceptance and commitment therapy. *International Journal of Behavioral Consultation and Therapy, 3*, 118–122.
- Rohan, M. J. (2000). A rose by any name? The values construct. *Personality and Social Psychology Review, 4*, 255–277.
- Rokeach, M. (1973). *The nature of human values*. New York, NY: The Free Press.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78.
- Ryan, R. M., & Deci, E. L. (2002). Overview of self-determination theory: An organismic-dialectical perspective. In: E. L. Deci, & R. M. Ryan (Eds.), *Handbook of self-determination research*. (pp. 3–33). Rochester, NY: University of Rochester Press.
- Sagiv, L., Roccas, S., & Hazan, O. (2004). Value pathways to well-being: Healthy values, valued goal attainment, and environmental congruence. In: P. A. Linley, & S. Joseph (Eds.), *Positive psychology in practice* (pp. 68–85). Hoboken, NJ: John Wiley & Sons.
- Sagiv, L., & Schwartz, S. H. (2000). Value priorities and subjective well-being: Direct relations and congruity effects. *European Journal of Social Psychology, 30*, 177–198.
- Schwartz, S. H., Melech, G., Lehmann, A., Burgess, S., Harris, M., & Owens, V. (2001). Extending the cross-cultural validity of the theory of basic human values with a different method of measurement. *Journal of Cross-Cultural Psychology, 32*, 519–542.
- Schwartz, S. H., & Bardi, A. (2001). Value hierarchies across cultures: Taking a similarities perspective. *Journal of Cross-Cultural Psychology, 32*, 268–290.
- Schwartz, S. H., & Bilsky, W. (1987). Toward A universal psychological structure of human values. *Journal of Personality and Social Psychology, 53*, 550–562.
- Schwartz, S. H., & Bilsky, W. (1990). Toward a theory of the universal content and structure of values: Extensions and cross-cultural replications. *Journal of Personality and Social Psychology, 58*, 878–891.
- Schwartz, S. H., & Boehnke, K. (2004). Evaluating the structure of human values with confirmatory factor analysis. *Journal of Research in Personality, 38*, 230–255.
- Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology, 76*, 482–497.

- Sheldon, K. M., & Houser-Marko, L. (2001). Self-concordance, goal attainment, and the pursuit of happiness: Can there be an upward spiral? *Journal of Personality and Social Psychology*, *80*, 152–165.
- Skinner, B. F. (1957). *Verbal behavior*. Englewoods Cliffs, NJ: Prentice-Hall.
- Stewart, I., & Barnes-Holmes, D. (2001). Understanding metaphor: A relational frame theory perspective. *The Behavior Analyst*, *24*, 191–199.
- Statistics Finland. (2003). 0–85-vuotiaan odotettavissa oleva elinaika (elinajanodote) vuosina 1983 ja 2003. *Suomen virallinen tilasto (SVT): Kuolemansyyt*, Retrieved May 13, 2011 from <http://www.stat.fi/til/ksyyt/2003>.
- Statistics Finland. (2010a). Internetin käyttö työn, koulutuksen tai tiedon etsintään ja opiskeluun 3 kuukauden aikana 2010. *Suomen Virallinen Tilasto: Tieto- Ja Viestintätekniiikan Käyttö*, Retrieved May 5, 2011 from <http://www.stat.fi/til/sutivi/2010>.
- Statistics Finland. (2010b). Matkapuhelimien lukumäärät kotitalouksissa, marraskuu 2010. *Suomen Virallinen Tilasto: Kuluttajabarometri*, Retrieved May 5, 2011, from <http://www.stat.fi/til/kbar/2010/12>.
- Statistics Finland. (2010c). Väestöllinen huoltosuhte 1950–2009 ja ennuste 2010–2050. *Suomen Virallinen Tilasto (SVT): Väestörakenne*, Retrieved May 5, 2011 from <http://www.stat.fi/til/vaerak/2009>.
- time. (2010). In: *Merriam-Webster Online Dictionary*. Retrieved August 5, 2010, from <http://www.merriam-webster.com/dictionary/time>.
- Tuomisto, M. T., Lappalainen, R., & Timonen, T. E. (2005). *Funktionaalisen käyttäytymisanalyysin perusteet* (2nd ed.). Tampere: Suomen Käyttäytymistieteellinen Tutkimuslaitos.
- Vansteenkiste, M., Duriez, B., Simons, J., & Soenens, B. (2006). Materialistic values and well-being among business students: Further evidence of their detrimental Effect. *Journal of Applied Social Psychology*, *36*, 2892–2908.
- Vansteenkiste, M., Lens, W., & Deci, E. L. (2006). Intrinsic versus extrinsic goal contents in self-determination theory: Another look at the quality of academic motivation. *Educational Psychologist*, *41*, 19–31.
- Vansteenkiste, M., Matos, L., Lens, W., & Soenens, B. (2007). Understanding the impact of intrinsic versus extrinsic goal framing on exercise performance: The conflicting role of task and ego involvement. *Psychology of Sport and Exercise*, *8*, 771–794.
- Vansteenkiste, M., Sierens, E., Soenens, B., Luyckx, K., & Lens, W. (2009). Motivational profiles from a self-determination perspective: The quality of motivation matters. *Journal of Educational Psychology*, *101*, 671–688.
- Vansteenkiste, M., Simons, J., Lens, W., Soenens, B., & Matos, L. (2005). Examining the motivational impact of intrinsic versus extrinsic goal framing and autonomy-supportive versus internally controlling communication style on early adolescents' academic achievement. *Child Development*, *76*, 483–501.
- Vansteenkiste, M., Simons, J., Lens, W., Soenens, B., Matos, L., & Lacante, M. (2004). Less is sometimes more: Goal content matters. *Journal of Educational Psychology*, *96*, 755–764.
- Vansteenkiste, M., Simons, J., Soenens, B., & Lens, W. (2004). How to become a persevering exerciser? Providing a clear, future intrinsic goal in an autonomy-supportive way. *Journal of Sport & Exercise Psychology*, *26*, 232–249.
- Vansteenkiste, M., Simons, J., Soenens, B., Lens, W., Sheldon, K., & Deci, E. (2004). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology*, *87*, 246–260.
- Vansteenkiste, M., Timmermans, T., Lens, W., Soenens, B., & Van, d. B. (2008). Does extrinsic goal framing enhance extrinsic goal-oriented individuals' learning and performance? An experimental test of the match perspective versus self-determination theory. *Journal of Educational Psychology*, *100*, 387–397.

- Wigfield, A., & Eccles, J. S. (2000). Expectancy–Value theory of achievement motivation. *Contemporary Educational Psychology, 25*, 68–81.
- Wilson, K. G. (2010, 2010, October 5). Re: [acceptanceandcommitmenttherapy] values Message posted to Message posted to Acceptance and Commitment Therapy electronic mailing list, archived at <http://tech.dir.groups.yahoo.com/group/acceptanceandcommitmenttherapy/message/20236>.
- Wilson, K. G., & Dufrene, T. (2009). *Mindfulness for two: An Acceptance and Commitment Therapy approach to mindfulness in psychotherapy*. Oakland, CA: New Harbinger.

Appendix A: Questionnaire

Tulosta

Motivointi elämäntapamuutokseen

Hyvä vastaaja,

Olet osallistumassa psykologian pro gradu -tutkielmaani liittyvään kyselyyn. Kyselyssä selvitetään, kuinka kannustaviksi koet eri tavoin esitetyt viestit, joiden tarkoitus on motivoida Sinua säännöllisen liikunnan aloittamiseen.

Tätä varten pyydän Sinua kuvittelemaan itsesi tilanteeseen, jossa et liiku säännöllisesti ja olet pohtimassa seuraavia asioita:

- Liikunko nykyiselläni riittävästi?
- Olisiko minun mahdollista muuttaa liikuntatottumuksiani?
- Olisiko liikunnan lisäämisellä myönteisiä vaikutuksia elämäni?

Kyselyssä Sinulle esitetään 11 viestiä. Tehtävänäsi on arvioida, kuinka motivoivaksi kokisit kunkin viestin edellä mainitussa tilanteessa. Kyselyn lopussa kartoitetaan vielä joitakin taustatietoja vastaustesi analysoimiseksi. Kyselyyn vastaaminen vie reilut 5 minuuttia. Päästäksesi liikkumaan kyselyssä eteenpäin sinun on vastattava jokaiseen kysymykseen. Huomaathan, että kysymykseen kerran vastattuasi et enää myöhemmin pääse muokkaamaan vastaustasi. Vastauksesi käsitellään täysin nimettöminä ja tulokset esitetään siten, ettei ketään vastaajaa ole mahdollista tunnistaa.

Mikäli Sinulle jää vielä jotain kysyttävää, vastaan mielelläni kaikkiin kysymyksiisi.

Kiitos osallistumisestasi!

Kaisa Korhonen
kaisa.m.korhonen@uta.fi

Kuvittele, että pohdit liikunnan määrää arjessasi. Arvioi seuraavia viestien motivoivuutta asteikolla 0-10. (0=ei lainkaan, 10=erittäin paljon)

*Pakollinen kysymys

Miten paljon seuraava viesti motivoisi sinua säännöllisen liikunnan aloittamiseen? *

0 1 2 3 4 5 6 7 8 9 10

Olet viime aikoina liikkunut melko vähän. Sinun kannattaa alkaa liikkua säännöllisesti. *

(Sivu 1 / 15)

0 1 2 3 4 5 6 7 8 9 10

Olet viime aikoina liikkunut melko vähän. Sinun kannattaa alkaa liikkua säännöllisesti. Säännöllinen liikunta auttaa sinua jaksamaan. *

(Sivu 2 / 15)

0 1 2 3 4 5 6 7 8 9 10

Olet viime aikoina liikkunut melko vähän. Sinun kannattaa alkaa liikkua säännöllisesti. Säännöllinen liikunta antaa sinulle voimavaroja elää hyvää elämää. *

(Sivu 3 / 15)

0 1 2 3 4 5 6 7 8 9 10

Olet viime aikoina liikkunut melko vähän. Sinun kannattaa alkaa liikkua säännöllisesti. Säännöllisen liikunnan avulla voit löytää liikuntamuotoja joista todella nautit ja saat lisää voimavaroja aktiiviseen elämään. *

(Sivu 4 / 15)

Olet viime aikoina liikkunut melko vähän. Sinun kannattaa alkaa liikkua säännöllisesti. Säännöllinen liikunta antaa sinulle voimavaroja hoitaa päivittäiset tehtäväsi ja velvollisuutesi. *

0 1 2 3 4 5 6 7 8 9 10



(Sivu 5 / 15)



Olet viime aikoina liikkunut melko vähän. Sinun kannattaa alkaa liikkua säännöllisesti. Säännöllinen liikunta antaa sinulle voimavaroja tehdä itseäsi kiinnostavia asioita ja innostua uusista asioista. *

0 1 2 3 4 5 6 7 8 9 10



(Sivu 6 / 15)



Olet viime aikoina liikkunut melko vähän. Sinun kannattaa alkaa liikkua säännöllisesti. Säännöllinen liikunta auttaa sinua näyttämään energiseltä ja hyvinvoivalta. *

0 1 2 3 4 5 6 7 8 9 10



(Sivu 7 / 15)



Olet viime aikoina liikkunut melko vähän. Sinun kannattaa alkaa liikkua säännöllisesti. Säännöllinen liikunta antaa sinulle voimavaroja muiden auttamiseen ja sinulle tärkeistä ihmisistä huolehtimiseen. *

0 1 2 3 4 5 6 7 8 9 10



(Sivu 8 / 15)



Olet viime aikoina liikkunut melko vähän. Sinun kannattaa alkaa liikkua säännöllisesti. Säännöllinen liikunta antaa sinulle voimavaroja tehdä ekologisia ja eettisiä valintoja päivittäisessä elämässäsi. *

0 1 2 3 4 5 6 7 8 9 10



(Sivu 9 / 15)



Olet viime aikoina liikkunut melko vähän. Sinun kannattaa alkaa liikkua säännöllisesti. Säännöllinen liikunta kuuluu yleisiin terveys-suosituksiin ja auttaa sinua pysymään kunnossa ja terveenä. *

0 1 2 3 4 5 6 7 8 9 10



(Sivu 10 / 15)



Olet viime aikoina liikkunut melko vähän. Sinun kannattaa alkaa liikkua säännöllisesti. Säännöllinen liikunta antaa sinulle voimavaroja näyttää kykysi muille ja vastata kunnianhimoisiinkin haasteisiin. *

0 1 2 3 4 5 6 7 8 9 10



(Sivu 11 / 15)



Seuraavaksi pyydän sinua miettimään, miten tärkeitä seuraavat arvot ovat sinulle. Valitse mieleisesi vaihtoehto. (0=ei tärkeä, 8=hyvin tärkeä) *

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| VALTA (mm. muiden hallitseminen, arvovalta, yhteiskunnallinen valta, varakkuus) * | <input type="radio"/> |
| SUORIUTUMINEN (mm. menestys, kyvykkyys, kunnianhimo, työteliäisyys, tavoitteiden saavuttaminen, vaikutusvalta ihmisiin ja tapahtumiin) * | <input type="radio"/> |
| MIELHYVÄ (mm. mielihalujen tyydyttäminen, itsensä hemmottelu, elämästä nauttiminen) * | <input type="radio"/> |
| VIRIKKEISYYS (mm. seikkailut, riskien otto, monipuolinen ja jännittävä elämä) * | <input type="radio"/> |
| ITSEOHJAUTUVUUS (mm. luovuus, vapaus, utelaisuus, riippumattomuus, omien tavoitteiden valitseminen) * | <input type="radio"/> |
| UNIVERSALISMI (mm. laajakatseisuus, luonnon ja taiteiden kauneus, sosiaalinen oikeudenmukaisuus, maailmanrauha, tasa-arvo, kypsä elämänyymmärrys, luonnon suojeleminen) * | <input type="radio"/> |
| HYVÄNTAHTOISUUS (mm. auttavaisuus, rehellisyys, anteeksiantavaisuus, uskollisuus, luotettavuus, ystävyys) * | <input type="radio"/> |
| PERINTEET (mm. perinnästäpojen kunnioitus, nöyryys, oman elämänosansa hyväksyminen, uskoon pitäytyminen, kohtuullisuus, maltillisuus) * | <input type="radio"/> |
| YHDENMUKAISUUS (mm. tottelevaisuus, vanhempien ihmisten kunnioittaminen, itsekuri, kohteliasuus) * | <input type="radio"/> |
| TURVALLISUUS (mm. kansallinen turvallisuus, perheen turvallisuus, yhteiskunnallinen järjestys, siisteys, palvelusten vastavuoroisuus) * | <input type="radio"/> |

(Sivu 12 / 15)

Liikuntatottumusten kartoitus *

*Pakollinen kysymys

Onko sinun yleensä helppoa löytää motivaatio liikuntaan? *

Kyllä Ei

(Sivu 13 / 15)

Taustatietosi *

*Pakollinen kysymys

Oletko *

Nainen

Mies

(Sivu 14 / 15)

Kokemuksesi kyselystä *

*Pakollinen kysymys

Jäitkö miettimään arvojasi ja niiden yhteyttä jokapäiväisiin valintoihisi? *

Kyllä En

(Sivu 15 / 15)

Lopuksi voit halutessasi antaa palautetta kyselystä.

Appendix B: Comments from the respondents (translated)

- Made me think, thanks! :)
- I would have wanted to go back, that wasn't possible. A 9-point scale was too fine, I couldn't tell the difference between a six and a seven.
- The motivational messages rated here and value questionnaire at the end were quite clearly linked to each other and it was nearly impossible to respond to them independently.
- I gave all the statements poor ratings for motivational quality. My motivation for anything dies, if the first thing I'm told is how poorly I've managed so far. I do sports approximately twice a week. If someone comes and tells me that I have had quite little exercise I lose the rest of my motivation. I'd rather have someone tell me that I'm doing well but could be doing even better.
- The message "you have had quite little exercise" in the beginning was in itself such a negative comment that after that any motivating message is weaker. You should not start a "motivating" message with a stick.
- All the messages had the same (demotivating) beginning "you have had too little exercise etc..." it was in itself very demotivating regardless of the ending.
- A pretty nice set!
- This was apparently about the link between values, related motivators and the willingness for exercise. I must say that my answers were more greatly affected by how artificial I found the statement rather than how much I value the goal.
- I didn't quite get this idea, no message could motivate me to exercise as I find anything but exercise from daily chores useless and unnatural.
- The scale 0–10 was too fine, and if such a broad scale must be used, the mean ("neither agree nor disagree") should be given to make answering easier.
- All the motivating messages started the same way, which reduced their motivational quality. You have all kinds "you should do this and that in order to this and that" ideas in your head all the time anyways. The motivating messages could have been more encouraging and straight, then I would have given them higher ratings.
- I was a little uncertain about the values questions. I don't agree with all the descriptions of the values. A common obstacle for exercise motivation is often the excuse that it's hard to find the right time. Especially on weekdays.
- There were too many options in the value questionnaire (1–8), it is hard to rate on such a small scale. All the messages started "you have had quite little exercise". If I did not have exercise, I'd probably know that I haven't had enough exercise lately. I could take offence from such encouragement.
- My answers might be a little weird :) Exercise is in itself very important to me, without it being (at least consciously) linked to other values. For that reason, messages that linked exercise with values that are otherwise important to me could not motivate me to exercise more (since I don't see a clear connection between them and exercise).

All proposed feedback was verbal, referring to some value. Often people have the information, and verbal feedback may not increase motivation, especially if it is qualitative. Quantitative feedback would in itself be more interesting and mirror behaviour, perhaps making people more motivated