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”SOME PEOPLE KNOW WHAT THEY ARE TALKING ABOUT – OTHERS DO NOT”

Literature review on credibility and cognitive authority in information seeking

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ABSTRACT

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People acquire information daily from different sources, both subconsciously and consciously. By consciously and continuously filtering information, people learn to identify sources of information that should be trusted over less credible sources. This concept of trusting information can be separated into two concepts: cognitive authority and credibility. This literature review examines the definitions of these concepts and their role in information seeking. This entry contends that cognitive authority is a degree of influence that can be consciously recognized as proper, while credibility is defined by the judgment of trustworthiness and competence made by the perceiver. In addition, these concepts are closely related, as credible sources are potential cognitive authorities. The conclusion of this review states that the assessment of credibility and cognitive authority are both significant factors in how people perceive information. This conclusion also suggests the need for both more quantitative studies and an extended range of studies spanning more demographics than scholars and young people examined in the reviewed studies.

Key words: cognitive authority, credibility, trustworthiness, credibility assessment, information seeking

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1 INTRODUCTION

It is impossible to live within our society without relying on information from an external source. If only to be dismissed without a second thought, information is continuously being evaluated by simply engaging in mundane tasks such as browsing social media, reading or even glancing at advertisements. If a person tries to form a comprehensive view of the world and at the same time avoid unnecessary or untrustworthy information, he is always impeded by his own acquired personal preference in specified knowledge and can never reach an objective view completely free of *cognitive authority*, the influence of information sources consciously recognized as proper (Wilson, 1983). This means that every view of the world is permeated by cognitive authority, either deliberately or subconsciously. This ubiquity of evaluation of information quality also highlights the need to consider the definition of what can be deemed *credible*. Exploring the definitions of cognitive authority and credibility allows for a more intricate understanding of how trust in certain information sources is built, in addition to further examining the significance of these concepts in information seeking and evaluating.

While the definition of credibility can be traced as far back as Aristotle's notion on ethos being "the communicator's ability to inspire confidence and belief in what was being said" (Stacks & Salwen, 2014), cognitive authority is a more recent concept, coined by Patrick Wilson in his 1983 book *Second-hand knowledge: an inquiry into cognitive authority.* Wilson justifies the importance of cognitive authority by pointing out its presence starting as early as a child trusting their parents, extending into school entrance requirements, hierarchical workplace authority and even in everyday decisions when choosing a plumber, for example. While previously both credibility and cognitive authority were considered only a part of relevance judgment in library and information sciences, the growth and popularization of the Internet providing far more varied ways of publishing, accessing and evaluating information expanded the ways credibility and cognitive authority are examined in fields of science, including human-computer interaction and social studies (Rieh, 2010).

In this study I will examine the definitions of credibility and cognitive authority and their role in information seeking by reviewing several studies that have been made concerning these subjects. In the second chapter I will briefly define the concepts of cognitive authority and credibility, provide the method of research and research questions that I will

be examining. In the third chapter, I will review previous studies on cognitive authority and credibility, starting by examining studies concerning cognitive authority, moving on to studies on credibility and its assessment, and finally examining the relation of cognitive authority and credibility. In the fourth chapter, I will review findings from these studies and answer the research questions. In the fifth, final chapter I will discuss the conclusions that can be drawn from examining studies made on cognitive authority and credibility and explore the benefits of further study, in addition to providing recommendations for future research.

2 THEORETICAL BACKGROUND

Given the highly subjective nature of the methods how people assess whether an information source is trustworthy or not, it is vital to first review previous studies made on the subject before conducting empirical research. Thus, my method of research in this study is literature review to examine the previous findings and possible theoretical frameworks made on the subject. An empirical research could be made after reviewing previous studies and their recommendations on studying cognitive authority and credibility.

2.1 Cognitive authority

The closest field of science that studies phenomena such as cognitive authority is social epistemology (Wilson, 1983), which investigates the epistemic effects of social interactions and social systems (Goldman & O'Connor, 2019). In a social context, cognitive authority is an influence rather than a power to command and a variable degree rather than an absolute property (Wilson, 1983). Cognitive authority can also be paralleled to epistemic authority, which is being *an* authority (De George, 1985). Cognitive authority, in a Web context, can be operationalized as "the extent to which users think that they can trust the information" (Rieh, 2002).

A cognitive authority is an information source that has an influence that can be consciously recognized and accepted as proper. Cognitive authority is in a critical role in answering open questions and our source to turn towards when seeking both information and advice. Cognitive authority is "taking people's opinions more or less seriously". (Wilson, 1983)

2.2 Credibility

Similar to cognitive authority, *credibility* is also fundamentally a social relation between two people. Differently from cognitive authority however, while a credible person might say something that can be considered proper, it might not have any influence on the receiver (Rieh, 2010). Credibility isn't a property of the information or the source, but rather the judgment and perception of an individual (Rieh & Jeon, 2014). Credibility can also be paralleled to deontic authority, which means to be *in* authority. (De George, 1985)

Furthermore, credibility has two main components: competence and trustworthiness, in that a credible source is honest or disinclined to deceive. Credible sources are the pool of potential candidates that might become cognitive authorities. (Wilson, 1983)

2.3 Research questions

As cognitive authority and credibility are closely related yet considered separate concepts, the research questions I will examine in this literature review are:

- How are cognitive authority and credibility defined in these publications?
- What is the role of cognitive authority and credibility in information seeking in these publications and has it changed with time?

3 COGNITIVE AUTHORITY AND CREDIBILITY IN INFORMATION SEEKING

In this literature review, I will examine studies on cognitive authority and credibility assessment to find out how the study of cognitive authority and credibility in information seeking has changed since the term was coined by Patrick Wilson in 1983. The studies I will examine are Wilson's 1983 book, Soo Young Rieh's studies on cognitive authority and credibility assessment in a Web-based environment and scientific articles by Savolainen (2007) and Meyers (2010) related to cognitive authority. I chose Wilson because several other researchers, including Rieh and Savolainen, have cited him as creating the baseline for cognitive authority research. Rieh was chosen because her research covers cognitive authority and credibility assessment extensively through a long period of time with clear continuity between studies. Savolainen and Meyers' articles were chosen to provide a more varied view of cognitive authority in the modern field of science.

I will start by examining studies that have researched cognitive authority, both by defining it and by examining its role in various environments. Starting with Wilson's 1983 book *Second-hand knowledge: an inquiry into cognitive authority*, which defines several key concepts and highlights the presence of cognitive authority in society, moving on to Rieh's studies on cognitive authority in WWW environments and information seeking and finally Meyers' article on cognitive authority experienced by young people in virtual environments. After examining studies on cognitive authority, I will move on to examining Rieh and Hilligoss' studies exploring the definition of credibility and its role in online information seeking. Lastly, I will examine the relation and similarities between credibility and cognitive authority, as presented in studies made by Savolainen and Rieh.

3.1 Examining cognitive authority

Starting from the history of cognitive authority by pointing out the existence of "cognitive monopolies", hierarchies of knowledge in society, where questioning the publicly recognized authorities with superior societal position is either prohibited or nonexistent. An example of these monopolies are primitive tribes, where the word of the headman of the tribe is absolute law (Wilson, 1983, p. 123). According to Wilson, in the modern society cognitive authority appears everywhere you might seek an outside opinion or information

on a subject that you possess no previous knowledge on. In these cases, you will most likely request assistance from a person whose influence on your thoughts you “consciously recognize as proper” (p. 15), the definition for a cognitive authority.

3.1.1 Cognitive authority

In his book, Wilson (1983) also expands on the justification of the importance of cognitive authority by arguing that we are "detached spectators", subjects who experience the view of the world with our own sensations, but also through the interpretations of both our own and others' experiences (p. 9). Because our own ideas are limited by range, we cannot hope to ever gather enough experience to form a coherent idea of the whole world on our own. We have to rely on second-hand perspective and interpretations of the world to construct a coherent view. However, a single person cannot ever evaluate every single second-hand perspective, so cognitive authority is needed to narrow down the number of potential candidates of trustworthy information sources. Wilson summarizes this need to filter out external points of view as: "Some people know what they are talking about, others do not. Those who do are my cognitive authorities." (p. 13)

Authority, in this case, means that something that the authoritative party says about a subject that he has authority in has value or weight to the listener. This kind of authority is always a relation between two people or intellectual entities, such as books or companies, different to an expert whose authority might be based on his achievements, whether they have value to me or not. Cognitive authority is also a matter of degree, as well as relative to the sphere of interest, as a person who has authority in a field that does not interest me is unlikely to be a cognitive authority to me. Cognitive authority is rather an influence than a power to command.

Wilson presents several reasons for justifying trust in a cognitive authority. One might simply find someone repeatedly convincing enough to trust them as a cognitive authority. This trustworthiness is not necessarily attributed to expert matters that require specific expertise, but rather matters that one can believe and understand to be plausible. Alternatively, a person I trust as a cognitive authority might hold ideas that I already trust to be true, so his views simply reinforce my own. In a larger scale, an expert’s opinion does not constitute knowledge to people who do not recognize them as cognitive authorities (Wilson, p. 30). Another example of justifying cognitive authority is reputation among peers as an attribute of a cognitive authority. This is exemplified by "trickle down cognitive

authority" or “authority transfer” (Wilson, p. 22), where you trust a person and that person trusts another person, so you trust the secondary person based on the primary persons judgement. Lastly, justification of cognitive authority may be based on *charismatic authority* (Wilson, p. 25), personal trust, or belief in a person. In this case, the authority is attained through expertise and personal accomplishments. A person might have recognized expertise only in his own specific field of work, but that person could still hold cognitive authority in a whole another field of work through his accomplishments in the other. For example, the opinions of a successful athlete or entertainer might be heard on a political matter even though his expertise and accomplishments are from a different field of work entirely.

3.1.2 Cognitive authority in individuals and everyday life

When it comes to an individual’s understanding of cognitive authority, according to Wilson (1983), “any understanding of a particular individual's pattern [of] recognition of cognitive authority has to start at the beginning of life" (p. 124). A person develops a "stock of [initial] authority beliefs", which is knowledge about the distribution of specialized knowledge. In other words, we learn which authorities to trust based on common knowledge acquired from personally trustworthy authorities, such as parents. Parents are generally trustworthy, and they trust these authorities, so it is safe to assume that they can be trusted as well.

On the other hand, Wilson argues that there are antiauthorities, which can be reliably deemed wrong or untrustworthy on all accounts. Dividing and recognizing these antiauthorities and authorities is done early on, usually based on what we are told, which religion is the correct one to believe in or which political parties are more reliable than others, for example. In addition to these general authorities that we adopt, Wilson suggests that we also accumulate a set of individual authorities, starting with our parents (p. 126). However, our parents are not initially true cognitive authorities, as young children are still interpreting the notion of cognitive authority and authority in general and cannot consciously recognize their influence as proper. Another important set of cognitive authorities early on in life are the members of our peer group. Even if parents or teachers might be recognized as proper sources of information, our peers hold a special cognitive authority on age-specific issues that teachers or parents have no sway over. This is also reinforced by Meyers (2010). According to Wilson, our set of cognitive authorities will always depend on which initial stock of beliefs a person has started with, as environment

can heavily influence our views on subjects that might appear completely different to a person coming from a different cultural background. However, many, if not most of these adapted authorities will change as we accumulate experience and expertise on various areas of life and gain knowledge that might influence our existing beliefs and authorities.

Another important encounter with cognitive authority that most people will face are entrance requirements in life. Going to school requires young people to acquire knowledge of various subjects that may or may not be desirable to them. However, performing adequately is necessary in order to stay in favor of society and adapt into it. These requirements are often set by teachers and other educational authorities, which can also be called *administrative authorities* (Wilson, p. 128). Administrative authorities tell others what they have to know and control various "cognitive entrance requirements", such as school entrance exams. Administrative authority is not cognitive authority, as it does not require the students to consciously recognize their influence as proper, only necessary in order to perform well by society's standards. It might also be socially necessary to at least superficially deem them as cognitive authorities, simply because disagreeing might be against the norm. Administrative authorities are also present in work life, especially in ordinary workplaces with a hierarchical job ladder, where the employees receive orders from their superiors. In this case the cognitive authority comes with the job and the employees trust their superiors because they are paid to do so, not necessarily because they consciously deem their influence as proper.

In addition to cognitive authority present in professional fields, Wilson examines the responsibility of knowledge in everyday life, where the cognitive authority of everyday professionals, such as plumbers, doctors and technicians is the presumed knowledge that they possess in the eyes of the customer (p. 138). Customers cannot determine the cognitive authority of everyday professionals without specialist knowledge, but customers can safely assume that the position of the professionals grants them enough expertise. The responsibility of possessing enough knowledge to completely evaluate the information needed to solve the problems or tasks in our everyday life is far too great to be handled alone. Ergo, we trust and delegate this weight to others; professionals that we deem knowledgeable or authoritative enough. Customers also more often trust existing cognitive authorities instead of the professionals themselves, in part because of competition among cognitive authority spots among professionals. All everyday professionals that

market their services want you to be their customer instead of someone else's. This competition between specialists is incomprehensible from the viewpoint of an outsider to the field and thus creates a dilemma of trusting professionals with cognitive authority. Professionals cannot be entirely trusted on matters of their own field as they are intrinsically biased towards themselves and the customer's opinion is not sophisticated enough due to the lack of specialist knowledge in the field. This makes trial-and-error and relying on second-hand knowledge from your other cognitive authorities necessary in order to find a professional whose work will be satisfactory. (Wilson, p. 139)

3.1.3 Cognitive authority in other entities

Wilson also examines cognitive authority in entities other than people, as "it is not only individuals in whom we recognize cognitive authority; we recognize it as well in books, instruments, organizations and institutions", independent of the individuals who produced them. As an example, a leader of an organization can speak on behalf of the whole corporation, where all the cognitive authorities within this organization unanimously agree to one opinion. Wilson calls this *institutional authority* (p. 81, 169). According to Wilson, the cognitive authority of a text holds roughly the cognitive authority of its author at the time of its publishing. In addition to this definition, Wilson also separates other aspects that can affect the cognitive authority of a text. These are:

- Time (Generally, the newer the publication, the more correct and up to date the information.)
- Author (If the author already had cognitive authority by the time of publishing, his texts hold his authority too. Likewise, if a text gains cognitive authority, so does the author of the text.)
- Publisher (Renowned and respected publishers that regularly publish highly authoritative texts can be trusted to do so in the future as well, thus a text published by a certain publisher gains cognitive authority.)
- References (How many times or by what kind of other texts the text is referenced. This is more apparent in texts of objective information that can be universally deemed correct, such as dictionaries and guidebooks.)
- Recommendations by an existing cognitive authority (If a person that holds cognitive authority recommends a text, it can safely be assumed to be at least somewhat credible.)

- The test of enough information (If I am looking for information on the topic of the text, do I need to look further than this text in order to acquire enough knowledge to satisfy me?)
- Overall credibility of the text (Or intrinsic plausibility, can one believe what the text says, or can one at least take it seriously?)

To summarize, the cognitive authority test of a text is essentially a quality control question for the people who made the text available, judging whether the document is worth reading or not.

3.1.4 Cognitive authority in online information seeking

Wilson carefully distinguishes the presence and characteristics of cognitive authority in traditional media and everyday situations, but since the publication of his book in 1983, the advent of the Internet has tremendously changed the scope of evaluating cognitive authority. With no systematic publishing mechanisms to provide a reliable way of evaluating the trustworthiness of information sources, the study of cognitive authority in the Internet varies greatly from traditional methods.

Following Wilson's (1983) findings, Rieh and Belkin (1998) explore authority and trustworthiness in World Wide Web (WWW), arguing that information retrieval in the WWW has a more critical need of information filtering than traditional information retrieval from printed publications. Rieh and Belkin separate two main reasons for this: first, there is no overall quality control mechanism online as compared to printed publications. In addition, the dynamic nature of the Web makes the users' previous experience and the traditional way of determining authority (Wilson, 1983) largely irrelevant. To examine how people make judgments about information quality and authority, Rieh & Belkin interviewed university staff and students about their practices with WWW information tasks and problems. From these interviews, Rieh & Belkin identify seven facets of judgment of information quality:

1. Source (Where the document comes from) Rieh & Belkin separate the characteristics of the source into two levels in their study: institutional authority and individual authority. Institutional authority involved the institutional domain identified by URL, institution type (university, company, organization, private individ-

ual, unidentified) and institution reputation recognized by names of these institutions. Individual authority included the identification of the creator or author (the more information provided about the author, for example institution or address, the more believable the text), creator or author affiliation by institution and the name of the creator or author (familiar names were deemed more trustworthy).

2. Content (What is in the document and how useful it was for the reader)
3. Format (Formal characteristics of a document; how the website and the text are displayed and arranged)
4. Presentation (How a document is written or presented and how comprehensive it is)
5. Currency (Whether a document is up to date)
6. Accuracy (Whether the information in a document is accurate)
7. Speed of loading (How long it takes to load a document)

The interviewed scholars were also concerned of three factors in evaluating information quality: the consequences of the use of information, act or commitment based on information and the focus of inquiry.

Rieh & Belkin also compare traditional information evaluation criteria to online evaluation. While there is a distinct lack of confirmable institutional authority on the Web, when present, it is also considered one of the most important factors in evaluating online information. This leads to dependency on recognizable institutional authority rather than the actual contents of the information. However, evaluation through second-hand knowledge was also present in Web information search, as the subjects initially sought out information sources that they knew through recommendations made by their existing cognitive authorities or ascertained information to be credible through their acquaintances.

Following their first study in 1998, Rieh and Belkin research *predictive* and *evaluative judgment* (Hogarth, 1987) in their 2000 study. Predictive judgment is made before opening the page in browser and is based on first-hand experience and second-hand knowledge of the page to which the user is heading to. Evaluative judgment is the active evaluation of the information content of the page which the user is currently viewing. If the predictive judgment made before opening the page does not match the evaluative judgment made when viewing the page, Rieh & Belkin suggest that the user might go back to a previous page or search for another page that matches their predictions more accurately.

Similar to their previous research, Rieh & Belkin (2000) interviewed university scholars and asked them to describe their searching experiences in the Web and then tasked them with several different search tasks, including research, travel, medicine and computer related tasks. These interviews found out that when doing predictive judgment before they looked at some webpages, the subjects were substantially concerned (55,1% of answers) about information quality and cognitive authority. In this case, cognitive authority was used as a facet when information was said to be "trustworthy, reliable, credible, reliable, respectable or reputable". On the other hand, while making evaluative judgments while looking at a webpage, the percentage of answers concerned with information quality and cognitive authority was also considerably high (66,3%). In evaluative judgment, cognitive authority was used as a category when the answers deemed the webpage as "trustworthy, credible, reliable, scholarly, official or authoritative". In addition, the interviewed scholars mentioned both first-hand experience and second-hand knowledge as a way of identifying authoritative sources.

In her 2002 study Rieh utilizes the research data from her previous studies (Rieh & Belkin, 1998, Rieh & Belkin, 2000) to further examine the notions of information quality and cognitive authority in the Web. Rieh operationalizes information quality in this context as "the extent to which users think that the information is useful, good current or accurate", and cognitive authority as "the extent to which users think that they can trust the information". Rieh also further differentiates the types of judgment made when identifying information in the Web into predictive judgment and evaluative judgment (Hogarth, 1987), relevance judgment and relevance criteria.

Adding to the findings of her previous studies (Rieh & Belkin, 1998, Rieh & Belkin, 2000) from this data, Rieh (2002) argues that different from previous studies about judgments of information quality, the judgments "are not only based on external factors, but also in individuals' own knowledge". Another important finding is the importance of previous knowledge in predictive judgment that also reinforces Wilson's (1983) findings on cognitive authority – first-hand experience was frequently utilized in order to identify trustworthy information, in addition to second-hand knowledge being used to fill in the lack of first-hand experience. Official, governmental and non-profit organization websites were also deemed more credible than commercial websites, leaning to the idea of institutional authority and its importance in WWW information retrieval. Rieh (2002) also argues that the concepts of information quality and cognitive authority are closely

related, as judgments of information quality are made based on the authority of sources, and in turn this authority provides the pool of possible information from which to judge the quality of the information.

Rieh (2002) suggests that Web search engines should support predictive judgment by providing methods of finding information by direct source or type of source, such as governmental or non-profit, in addition to simply content. Furthermore, additional ways of identifying the quality and cognitive authority on a webpage were suggested, such as displaying source reputation, the type of information source or author/creator credentials for users to make evaluative judgments more easily.

In addition to studies researching cognitive authority in scholarly environments, Meyers (2010) also notes the importance of cognitive authority as a factor in the information seeking. He states that epistemic thinking, as a form of metacognition, is a foundational capacity of the information-literate student in the digital age. In his study Meyers examines the issues of authority and trust of preteens (aged 9-13). Similar to Wilson (1983), he notes that children build an "initial stock of authority" in childhood that serves as a foundation for a lifetime of inquiry and learning. He also points out the transition from the "small world of authority" with traditional authorities such as parents and teachers to a wider range, including peers and other sources, also initially presented by Wilson.

In his study, Meyers (2010) found that preteens more often relied on peers than authorities such as parents or teachers when seeking information on topics they deemed important or sensitive, even though they thought these authoritative figures would have provided them with more accurate information. This suggests an emotion-based cognitive authority as a barrier for seeking accurate information. In addition, this reinforces the idea of the characteristics of information sources being a factor in assessing credibility rather than simply authoritative answers. Meyers emphasizes the fact that this arises as a problem especially in digital environments, where the physical aspect of cognitive authorities is often completely absent.

This leads to youth not being able to relate to authorities that are solely text-based, due to the lack of emotional connection essential to building authority, as the connection is not simulated by the presence of a virtual character or an avatar. According to Meyers (2010), this situation has its pros and cons, since blocking personal information sharing is a crucial for deterring online predators, but it also hinders the shaping of cognitive authorities

for young people. While providing a platform for open discussion, anonymity provides nothing to build authority upon. As a practical example, Meyers states that rumor evaluation can be a serious hindrance for children who are emotionally invested in online worlds, as they are unable to base their own knowledge on any authority structures.

In conclusion, Meyers notes that the cognitive authority in everyday problems is built upon uncertain knowledge (asking for clarification) and emotion-based trust (social relations as basis of trust). Young people relying on traditional authorities is not to be taken for granted and these authorities dismissing the information sources children have already built trust upon can conflict with the knowledge handling development of children. Lastly, Meyers points out the need to teach cognitive strategies instead of simply asserting cognitive authority or dominance.

Following the studies of environments of cognitive authority, Rieh (2010) also examines authority assessment, distinguishing authority from merely expertise and underlining the fact that authority is always a relation between two people and limited to social spheres. From two broad categories of authority, deontic authority (being in authority) and epistemic authority (being an authority) (De George, 1985), Rieh notes that these two terms can also be synonymous to cognitive and administrative authority, cognitive authority resembling epistemic authority and administrative authority resembling deontic authority. Rieh expands on the definition of cognitive authority by assessing that cognitive authority is an influence some people may exert, and a matter of degree between individuals that bases on the person being both an expert in their field and reputable amongst their peers. Rieh also reiterates on Wilson's (1983) criteria for the cognitive authority of a document; author, publisher, text type and its intrinsic plausibility.

3.2 Examining credibility

In addition to examining the authority and influence of information sources, several studies have been made exploring credibility assessment in online information seeking. As cognitive authority and credibility are closely related, it is beneficial to also study how credibility assessment can be operationalized, especially in multifaceted Web contexts with a multitude of different factors that might affect the way users judge whether to examine the website further or not.

Rieh (2010) examines the historical development of the concept of credibility, stating that it can be traced as far back as Aristotle's quote on ethos being "the communicator's ability to inspire confidence and belief in what was being said." (Stacks & Salwen, 2014). Other notable cases of credibility research landmarks according to Rieh include the 1900s notion of credibility being determined by the audience's acceptance of the speaker and 1950s popularity surge of television, which in turn began the study of media credibility. In library and information sciences, Rieh notes relevance and utility as concepts of information retrieval effectiveness until 1990s, when far more diverse criteria for relevance judgment was uncovered (Maglaughlin, 2002). After this, the advent of the World Wide Web sparked a more urgent need for personal credibility judgment and its study, due to the lack of systematic quality control mechanisms, as opposed to traditional or printed media.

In their 2008 study, Rieh & Hilligoss examine young people's information-seeking processes, what kind of information they are seeking and by what methods. Information seeking in this context is "purposive seeking for information as a consequence of a need to satisfy some goal" (Wilson, 2000). Previous studies (Large, Behesthi & Breuleux, 1998, Hirsh, 1997, Large, 2005) have examined young people's search behaviors in various digital media environments and found that young users experience difficulty in Web search engine query formulation and in identifying the credibility of information they find. However, these studies range across different age groups from children to college students, so cohesive results across all ages were not available. Moreover, several studies (Metzger, Flanagin, Zwarun, 2003, Jones, 2002) show that the internet is both considered useful in academic studies by college students, and used more than traditional media by young people, highlighting the importance of research studying digital information rather than traditional ways of seeking information.

Rieh & Hilligoss (2008) conducted a qualitative study to evaluate college students' credibility assessments in the context of everyday-life information seeking, by recording written experiences of information seeking in the form a daily personal diary written by the subjects. In the context of specific, current or personal information search goals, Rieh & Hilligoss found that the concern for credibility was the highest when seeking information for search goals such as academic achievement, problem solving and personal information needs related to, for example, health and finances. On the other hand, when seeking information for entertainment, credibility was deemed less important. In addition,

credibility was deemed important when seeking information that directly affected another person, for example when searching information on behalf of someone else or for a purchase for someone else.

Rieh & Hilligoss (2008) also point out the social context of credibility judgments, as they found that some students might not see a source as credible unless another person, preferably in an authoritative position such as teacher, also deems it credible. Furthermore, the subjects in the study also filtered out information by social context by dismissing sources of information that another person had also dismissed. Social context was also relevant in cases where students agreed within a closed group of individuals, such as in a classroom or in a study group, on the environmental limitation of some information that might not be applicable to contexts outside these groups.

In addition to examining predictive and evaluative judgments of the information seeking process, Rieh & Hilligoss (2008) also explore verification as part of the judgment of the credibility of information, performed after evaluative judgment. Verification may occur in at least two situations; when starting to doubt information that was initially judged as satisfactory, or when encountering an information source of questionable credibility and thus requiring additional verification before using this information. This indicates that credibility judgments are a continuous, iterative process rather than linear composed of only initial predictive and evaluative judgment.

Rieh & Hilligoss also distinguish three different information seeking strategies employed by college students closely related to credibility judgments:

1. Starting information seeking in a trusted place. (Turning to an individual or a specific source of information that they knew to be trustworthy in the context of the information need)
2. Using multiple resources and cross-referencing. (Similar to verification in the credibility judgment, backing up credibility of an information source by addressing other sources.)
3. Compromising information credibility and convenience. (Balancing the effort required to find information by settling for satisfactory results on topics not deemed critical.)

In conclusion, Rieh & Hilligoss' (2008) findings indicate that contrary to previous studies (Graham & Metaxas, 2003, Large, 2005), young people, or at least college students, are

not as naïve as these studies suggest. In addition, Rieh & Hilligoss argue that while young people are more adept in using digital media and the Internet than older generations, young people also value second-hand knowledge from more traditional authoritative sources, such as professors, fellow students or printed media. Following this, it is a worthwhile prospect to both study further and to teach or encourage young people's credibility judgment processes.

Expanding on the characteristics of online credibility assessment, in her study of the credibility assessment of Yahoo! Answers QA section, Rieh & Jeon (2014) note that the credibility of the answers can be assessed in the dimensions of attitude, trustworthiness and expertise. In the context of this study, attitude means the investment and time spent in effort towards the answer. However, the overall investment into the site (visualized through the "Top contributor"- badge) does not equal expertise in the answer. Trustworthiness, in the context of this study, meant the overall decency and surface characteristics, such as the formatting of the text answer. Trustworthiness is also related to context-related non-bias, as the participants doubted that the answerer would "take the time to deliberately lie to strangers.". Expertise, in this context, was composed out of verification of the answer (multiple similar answers), satisfying the information need of the inquirer, self-proclaimed expertise on the field and previous experience of answering similar questions.

In her 2009 study, Rieh ties together various reviews on credibility assessment, suggesting that credibility, rather than having one definition, is an amalgamation of different concepts, most importantly including trustworthiness and expertise (Hovland, Janis & Kelley, 1953). Notably, these two concepts individually do not constitute for credibility, as an expert might not be completely unbiased, and a trusted friend might not have the required knowledge to be accounted as a credible source of information. Rieh also notes that credibility is not an intrinsic quality of a person or an object, but rather a conclusion of subjective assessment by the observer of these people or objects.

Furthermore, Rieh (2010) provides a review of different credibility types, including the traditional distinction of source, message and media credibility. In addition, the field of human-computer interaction argues that computer credibility assessment could be divided into presumed, reputed, surface and experienced credibility in how users judge credibility in Web information seeking (Tseng & Fogg, 1999). Studies that consider social endorsement a critical aspect in credibility assessment in turn divide credibility construction into

conferred, tabulated and emergent credibility as levels of the user's individual opinion on the information source they are evaluating (Flanagin & Metzger, 2008).

3.3 Converging credibility and cognitive authority

In addition to findings from her previous studies (Rieh & Belkin, 1998, Rieh & Belkin, 2000, Rieh, 2002), Rieh (2010) ties together various studies and conclusions on credibility and cognitive authority assessment. Rieh highlights the close relation of cognitive authority and credibility, while also arguing for the clear distinction between cognitive and administrative authority.

Following the definitions of both credibility and cognitive authority, Rieh (2010) connects the assessing of both credibility and cognitive authority, examining some theoretical frameworks on the topic. She mentions Rieh's Model of Judgment of Information Quality (Rieh, 2002) about predictive and evaluative judgments on Web information searching. In addition, Rieh briefly explains Wathen and Burkell's model of credibility assessment (Wathen & Burkell, 2002), which rates the credibility of a Web search by surface characteristics, followed by source credibility and ultimately by message presentation and content, and Fogg's Prominence-Interpretation Theory (Fogg, 2003), which argues that the credibility assessments of a Web site is composed of two events that need to occur: noticing the elements (prominence) and judging what is noticed (interpretation). Adding to theories of credibility assessment, Rieh also points out that in order for these assessments to be made, the user has to "engage fully in the cognitive effort of making analytical judgments of content message and sources", ergo the users often rely on mental shortcuts to make generalizations of the information content at a glance, dismissing further judgment.

Tying up her review on studies concerning credibility and cognitive authority, Rieh (2010) argues that the assessment of credibility and cognitive authority "has become a ubiquitous human activity, given that people constantly make decisions and selections based on the value of information in a variety of school, work, and everyday life contexts", while also encouraging future research to explore a broader range of information activities that new and diverse media applications are making possible and not only focusing on scholarly information seeking.

Adding to the notion of credibility and cognitive authority being closely related, Savolainen (2007) examines how people understand media credibility and cognitive authority in the context of seeking orienting information, and the differences in evaluating the credibility of information sources and cognitive authority. In the literature review of his study, Savolainen notes the complex and multidimensional nature of the concepts of media credibility and cognitive authority. Although these concepts overlap each other, both discuss the issues of believability of information, even though with different emphasis.

Savolainen (2007) also notes that first-hand experience overrides any possible absolute authority, as own experience is more important than source credibility. This was also reflected in the subjects receiving conflicting information from different authorities concerning environmental issues, as every participant in Savolainen's study had a skeptical approach to every information source, even to parties they initially trusted. Savolainen suggests that the participants formed pools of cognitive authorities and the final judgment was made first-hand.

4 RESULTS

4.1 Summary

The term "cognitive authority" is considered (Rieh, 2005, Savolainen, 2007) to have been coined by Patrick Wilson, in his 1983 book "Second-hand knowledge – an inquiry into cognitive authority". Wilson justifies the existence and importance of cognitive authority by pointing out examples of cases such as cognitive monopolies, cognitive entrance requirements and the cognitive authority of everyday professionals, in addition to other different facets of authority, including administrative, critical and institutional authority. These methods of judging information quality serve as the basis for publications by other researchers, who deploy Wilson's research to modern information systems and methods of evaluating information in environments that were not present in 1983, such as the WWW.

Rieh, in turn, explores the definition of cognitive authority and evaluating information in more recent contexts, mainly in the internet (Rieh & Belkin, 1998, Rieh & Belkin. 2000, Rieh, 2002) and search engines (Rieh & Hilligoss, 2007). Rieh distinguishes different characteristics of judgment of information quality (Rieh & Belkin 1998, Rieh & Belkin, 2000) and information retrieval tasks and problems (Rieh & Hilligoss, 2007) while comparing them to the traditional information evaluation, as established by Wilson (1983). Tying together the results of her previous studies and with a review on other studies on credibility and cognitive authority assessment in related fields, including human-computer interaction and social studies, she argues that the assessment of credibility and cognitive authority is a ubiquitous human activity, present in professional, scholarly and everyday activities whenever information is evaluated, consciously or subconsciously (Rieh, 2010). The characteristics of cognitive authority in Web-based interaction are also distinguished by Meyers' and Savolainen's studies which examine young people's and activists' approaches to cognitive authority in the internet.

4.2 Results

To answer the first research question, Wilson defines cognitive authorities as people or documents whose influence the "detached spectators", individuals experiencing their own

subjective world view, can "consciously recognize as proper". Wilson also highlights the difference of cognitive authority to other types of credibility related authority, namely administrative authority. Following on Wilson's conclusions, Rieh also underlines the fact that cognitive authority is always a relation between people, rather than a property of an object or a person. In her 2010 study, she also notes the similarity of cognitive authority to the concept of epistemic authority in the field of social epistemology, which is the concept of being *an* authority. In Web context, Rieh (2002) operationalizes cognitive authority as "the extent to which users think that they can trust the information".

According to Wilson there are two main components to credibility: trustworthiness and competence. Credibility differs from cognitive authority in that while a credible person can say something that is considered proper, it is not necessarily influential. Moreover, Wilson argues that credible sources of information are the potential pool of candidates that might become cognitive authorities. Rieh argues that in addition to being an iterative process rather than a property of the information source or a linear event, credibility, especially with the popularization of the Internet, is a multidisciplinary construct, varying from fields of science and ways of interpretation by individuals.

To answer the second research question, it is evident that while the base roles of both cognitive authority and credibility have not changed according to the publications reviewed, the applications and assessment have become more multifaceted concepts. The most important distinction is between traditional, printed media and modern Web-based information, asserted by Rieh to be the lack of systematic quality control mechanisms. This absence of a reliable way of evaluating the credibility of an information source has increased the need for both studies and more precise assessment of personal credibility judgment. Both Rieh and Meyers (2010) also point out the presence of credibility assessment not only in scholarly and professional environments, but also in everyday-life activities, starting even from preteens aged 9-13. Furthermore, Rieh suggests that the assessment of credibility and cognitive authority has become a ubiquitous human activity.

5 DISCUSSION

5.1 Significance of cognitive authority and credibility

Following these conclusions, the significance of the role of cognitive authority and credibility in the modern era is apparent. Starting from Wilson in 1983, who argues that since we cannot realistically expect students to escape the influence of their milieu, it should be no cause of scandal if we recognize personal influence as a factor in individuals' world view. In addition to this, Wilson argues that even trying to escape the notion of being influenced by others' views of the world and pursuing a truly coherent, pervasive knowledge of the world that is not impeded by others' points of view is an insurmountable task for any human being. Even moving from a small world of information to a bigger information space may not necessarily result in acquiring more accurate information; on the contrary, it introduces more points of view to evaluate. The burden of one's own personal preference in specified knowledge lies in the way of a completely objective view of the world free of cognitive authority, yet without evaluation of the trustworthiness of sources of information the task of gathering knowledge about the world is far too great to bear in a lifetime.

Following this justification on the importance of acknowledging second-hand knowledge as a significant factor in personal influence, Rieh (2010) states that assessing cognitive authority has become a ubiquitous human activity that needs to be considered in a vast scale in our society, even more so in the academic fields of information. Understanding the definition and assessment of cognitive authority and credibility is essential in understanding also the way which people of all ages digest the information content that they interact with on a daily basis. This need is not only limited to library and information sciences, but naturally encompasses every field where the influence of professionals is a factor, most importantly human-computer interaction and social studies where studies about credibility have already been made (Rieh, 2010).

Not only is the study of credibility and cognitive authority important to understand the judgment of information quality made by individuals, it is also crucial in designing the environments that these individuals are experiencing and evaluating. As proposed by Rieh (2002), websites should take into account both predictive and evaluative judgment made

when opening and searching for a website in order for the users to construct a more comprehensive and helpful view. In addition to this, Meyers' (2010) article suggests that digital environments should also be designed with the assessment of cognitive authority in mind, in order to both provide young people a more secure environment and to deter possible online predators. Considering the harmful effect an absence of tangible authority figures might cause, teaching evaluation of information quality instead of simply asserting authority might also be a beneficial way of ensuring youth can form a healthy stock of initial authorities they can in turn draw potential cognitive authorities from.

The necessity of changing the way authorities are asserted in education is also supported by Rieh's 2008 study, which highlights the fact that since being a generation that has grown up along the advancement of personal computers and the Internet, modern youth may have a very different way of evaluating both the competence and trustworthiness of traditional authoritative figures, such as teachers. The presence of the Internet, being a near limitless source of information, is undoubtedly a factor that has most likely already restructured the ways which individuals form their world view alongside traditional education. However, this does not mean that traditional authorities are obsolete, as secondhand knowledge from trustworthy social acquaintances served as a reliable basis on how to search for additional information., as supported by both Wilson (1983) and Rieh (1998, 2008). Acknowledging the presence of cognitive authorities, understanding the dilemma of trusting professionals and the intrinsic bias of professionals towards themselves, as proposed by Wilson, may also be beneficial in making worthwhile decisions for both consumer and entrepreneur.

While studying the beneficial aspects of cognitive authority and credibility is a worthwhile prospect, the possible negative consequences of failing to form a healthy stock of authorities should also be considered. The contemporary concepts such as populism and "false news", where the verifiability of information might be overridden by how popular or influential the source of information is, are directly related to how individuals assess the credibility of these sources. The phenomenon of consciously recognizing information as proper despite scientific evidence suggesting otherwise could be a case of cognitive authority superseding traditional authority. Combining the unprecedented surge in the amount of possible information sources thanks to the Internet, social media providing increasingly isolated social spheres and the ubiquity of the need to evaluate information, it is unsurprising that extreme differences in world view are ever more present in society.

Studying how these divisions of credibility evaluation develop could help understand how people formulate opinions and both predict and prevent potential consequences of disputes caused by these differences.

However, the precise examination and decomposition of these causes might also prove to be simply too vast of a task to produce exact results. In addition to the nature of credibility assessment being a highly subjective concept, the myriad of networking applications, information sharing websites and social media already in use present a task of insurmountable scale to carefully deconstruct the ways people evaluate credibility and cognitive authority in them. A profound study on these applications might not be relevant anymore by the time it is completed. The publications examined in this literature review might also already be obsolete, as the ways that users evaluate information quality might have changed along the development of searching interfaces they use. Ergo, more general analysis on the users' habits may prove more beneficial than examining individual applications, while also taking into consideration the range of applications utilized during that time.

5.2 Further research

The studies analyzed in this literature review are mostly qualitative in nature. To better assess cognitive authority and its applications, perhaps more quantitative models could be constructed by measuring and distinguishing further characteristics of authority and how it is developed in both individuals and intellectual entities. This would allow more accurate research to be made and to narrow down the possible impact of cognitive authority present in modern spheres of interest and to gauge applications for these models.

Rieh (2002) suggests that instead of think-aloud interviews, post-search interviews in a laboratory setting, or open-ended interviews in a natural setting might prove to be more beneficial when searching for more accurate analysis on cognitive authority and judging credibility. Rieh also argues that more comparisons between printed and Web information sources should be made but given the diminishing use of printed sources of information, this seems redundant.

In her 2008 study, Rieh encourages future studies to avoid using pre-assigned questions in order to prevent subjects from simply repeating previous findings. Rieh rather encourages implicit and natural answers on how the subjects evaluate cognitive authority and

credibility, in order to construct more comprehensive results to serve as the basis on building theoretical frameworks.

The examined studies also focus mostly on scholarly or professional information seeking, even though Wilson, Rieh, Savolainen and Meyers prove the presence of credibility and cognitive authority assessment in all areas of life. Future studies should include a larger range of both ways of evaluating information in different environments, but also a broader range of subject groups in order to encapsulate the entire range of possible situations where an individual might evaluate credibility and cognitive authority. Rieh (2002) suggests media content creation, mediation and even devices used in information processing as possible other subjects to study alongside information seeking, but given the ubiquity of information evaluation, perhaps such limitations would only inhibit the possible results.

Furthermore, the methods of interaction, both professional and casual, are evolving rapidly as technology and different ways of communication develop and are popularized. This leads to inevitable obsolescence of past studies, especially when comparing the WWW from the past decades to the modern plethora of networking applications. The context of the time when the study was published should be considered.

6 REFERENCES

Wilson, P. (1983). *Second-hand knowledge: An inquiry into cognitive authority*. Westport, CT: Greenwood Press.

Salwen, M.B. & Stacks, D.W., Eds (1996). *An Integrated Approach to Communication Theory and Research*; Lawrence Erlbaum Associates, Inc.: Mahwah, NJ

Rieh, S. Y. (2010). Credibility and Cognitive Authority of Information. In M. Bates & M. N. Maack (Eds.) *Encyclopedia of Library and Information Sciences, 3rd Ed.* p. 1337-1344, New York: Taylor and Francis Group, LLC. https://deepblue.lib.umich.edu/handle/2027.42/106416

Goldman, A. & O'Connor, C. (2019) *Social Epistemology*. The Stanford Encyclopedia of Philosophy. Accessed from https://plato.stanford.edu/archives/fall2019/entries/epistemology-social/

De George, R.T. (1985). *The Nature and Limits of Authority*; University Press of Kansas: Lawrence, KS

Rieh, S. Y. (2002). Judgment of Information Quality and Cognitive Authority in the Web. *Journal of the American Society for Information Science and Technology*, 53(2), 145-161. doi:10.1002/asi.10017

Jeon, G. Y., & Rieh, S. Y. (2014). Answers from the Crowd: How Credible are Strangers in Social Q&A? *iConference 2014 Proceedings*, 663–668. doi:10.9776/14309

Rieh, S. Y. & Belkin, N. J. (1998). Understanding Judgment of Information Quality and Cognitive Authority in the WWW. *Proceedings of the 61st Annual Meeting of the American Society for Information Science, 35*, 279-289. https://www.researchgate.net/publication/238975063_Understanding_Judgment_of_Information_Quality_and_Cognitive_Authority_in_the_WWW

Rieh, S. Y. & Belkin, N. J. (2000). Interaction on the Web: Scholars' Judgment of Information Quality and Cognitive Authority. *Proceedings of the Annual Meeting of the Amer-*

ican Society for Information Science, 37, 25-38. https://www.researchgate.net/publication/242036099_Interaction_on_the_Web_Scholars'_Judgment_of_Information_Quality_and_Cognitive_Authority

Rieh, S. Y. & Hilligoss, B. (2007). College Students' Credibility Judgments in the Information Seeking Process. In M. Metzger, A. Flanagin (Eds.), *Digital media, youth, and credibility,* p. 49-72. MacArthur Foundation Series on Digital Media and Learning Cambridge, MA: The MIT Press. https://core.ac.uk/display/71339826

Savolainen, R. (2007). Media credibility and cognitive authority. The case of seeking orienting information. *Information Research, 12(3),* paper 319. http://www.informationr.net/ir/12-3/paper319.html

Meyers, E. M. (2010). Cognitive Authority in Everyday Life: From Small Worlds to Virtual Worlds. *Knowledge Quest, v38 n3,* 48-51. https://eric.ed.gov/?id=EJ888065

Hogarth, R. M. (1987). *Judgment and choice: The psychology of decision*. 2nd Ed. New York: John Wiley & Sons.

Maglaughlin, K.L.& Sonnenwald, D.H. (2002). User perspectives on relevance criteria: A comparison among relevant, partially relevant, and not-relevant judgments. *J. Am. Soc. Inform. Sci. Technol. 2002, 53 (5)*, 327–342. https://doi.org/10.1002/asi.10049

Wilson, T. D. (2000). Human Information Behavior, *Informing Science 3, no. 2 (2000)*, 49–56. http://inform.nu/Articles/Vol3/v3n2p49-56.pdf

Large, A., Beheshti, J., & Breuleux, A. (1998). Information Seeking in a Multimedia Environment by Primary School Students. *Library and Information Science Research 20, no. 4 (1998),* 343–75. doi:10.1016/S0740-8188(98)90027-5

Hirsh, S. (1997). How Do Children Find Information on Different Types of Tasks? Children's Use of the Science Library Catalog. *Library Trends 45 (1997):* 725–745. https://www.researchgate.net/publication/298057403_How_Do_Children_Find_Information_on_Different_Types_of_Tasks_Children's_Use_of_the_Science_Library_Catalog

Large, A. (2005). Children, Teenagers, and the Web. In Cronin, B. (Eds.), *Annual Review of Information Science and Technology 39*, p. 374-92. Medford, NJ: Information Today, 2005. https://doi.org/10.1002/aris.1440390116

Metzger, M. J., Flanagin, A. J. & Zwarun, L. (2003). College student Web use, perceptions of information credibility, and verification behavior. *Computers & Education, 41(3),* 271-290. https://doi.org/10.1016/S0360-1315(03)00049-6

Jones, S. (2002). *The Internet Goes to College: How students are living in the future with today's technology.* Pew Internet & American Life Project

Graham, L. & Metaxas, P. T. (2003). Of Course It's True: I Saw It on the Internet! Critical Thinking in the Internet Era. *Communications of the ACM 46, no. 5 (2003)*, 71–75. https://dl.acm.org/doi/10.1145/769800.769804

Hovland, C. I., Janis, I. L. & Kelley, H. H. (1953). *Communication and Persuasion*. Yale University Press: New Haven, CT.

Tseng, S. & Fogg, B.J. (1999). Credibility and computing technology. *Communications of the ACM 1999, 42 (5),* p. 39–44. https://dl.acm.org/doi/10.1145/301353.301402

Flanagin, A. J. & Metzger, M. J. (2008). Digital media and youth: Unparalleled opportunity and unprecedented responsibility. In Metzger, M. J. & Flanagin, A. J., (Eds.), *Digital Media, Youth, and Credibility*, p. 5-28, MIT Press: Cambridge, MA, 2008. doi: 10.1162/dmal.9780262562324.005

Wathen, C. N. & Burkell, J. (2002). Believe it or not: Factors influencing credibility on the Web. *Journal of the American Society for Information Science and Technology, 53 (2),* 134–144. https://doi.org/10.1002/asi.10016

Fogg, B. J. (2003). Prominence-interpretation theory: Explaining how people assess credibility online. In Cockton, G., Korhonen, P., (Eds.), *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, Fort Lauderdale, FL, April 5–10, 2003; ACM: New York, 2003; 722–723. https://dl.acm.org/doi/10.1145/765891.765951