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INFORMATION SEEKING BEHAVIOR: THE EFFECTS OF RELATIONALISM ON THE SELECTION OF INFORMATION SOURCES

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INFORMATION SEEKING BEHAVIOR: THE EFFECTS OF RELATIONALISM ON THE SELECTION OF INFORMATION SOURCES

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Abstract

In a world where “Google” is a verb, this research asks the question “what influences an individual’s decision to select one information source over another?” Previous works have discussed relational versus nonrelational information sources (Rulke, Zaheer, & Anderson, 2000). Other research focuses on the information quality (O'Reilly, 1982), source accessibility (Culnan, 1984, 1985), or source richness (Daft, Lengel, & Trevino, 1987; Daft & Macintosh, 1981) but all these prior works do not address the social aspects of information sources.

This research defines and develops the construct of relationalism which is reflective of the social aspects of information sources. An important argument put forth in this work is that individuals will interact differently with a source based on its relationalism. Communication literature suggests that an individual will respond socially to another’s social invitation even if the “other” is actually an inanimate object (Nass & Moon, 2000). For example, individuals responded to social cues given by a robot no differently than the same social cues from a three-year-old child.

To investigate source selection this research uses two experiments and a survey. The experimental approach allows for a high level of control over the task design and other extraneous influences. The survey methodology utilizes knowledge workers in business organizations, and examines the profiles of sources used in a realistic work setting. While the experimental design improves the internal validity of the model, the survey approach allows for a superior assessment of the external validity. Such methodological triangulation provides for a robust testing of the model and greater confidence in its emerging prescriptions.

The first experiment investigates the antecedents to relationalism. Objective design characteristics were found to be positively related to relationalism. Furthermore a socially

oriented factor was also related to relationalism. The second experiment investigated the relationship between relationalism and source selection. This experiment also included task effects and controlled for personality variables. The relationship between relationalism and source selection depended on the nature of the task with more complex tasks indicating a stronger preference for higher relationalism sources. The findings from the survey of knowledge workers largely corroborated the findings from the experiments though some differences were seen.

From the experimental and survey results implications for research and practice are developed. Further this research contributes to a deeper understanding of information source selection in a modern IT-enabled environment.

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Any undertaking the size and magnitude of a dissertation is the result of the efforts of a number of people. First and foremost this document is the fruition of many *many* hours of meetings and advice from my co-chairs, Varun Grover and Ray Henry. They always believed my completing this dissertation was a matter of "when" not "if" and the value of their patience and guidance was incalculable.

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Chapter 1: Introduction

Dave just bought a 2008 Lexus SC430 that comes standard with a voice-activated GPS system by Magellan. At first, Dave thought "I'll never use this thing." Sure enough, Dave never even looked at the GPS system for months let alone used it until one day he had to drive his car cross country to visit his family for the holidays. After looking at map after map and still not being sure of the best route to take, Dave thought to himself, "The salesman said the GPS in this car is just like talking to a person. Let's just see how smart this thing is." Dave punched in the address where he was going, and in seconds the GPS system had plotted his route.

The GPS system told Dave where to turn. The system gave normal commands, such as "Turn left on Oak Street in 100 feet." It also let Dave know if interesting attractions were ahead. As he was driving across Kansas, for example, the system announced that at the next exit, he could visit "Prairie Dog Town," home of the world's largest prairie dog and a six-legged steer.

As Dave kept driving, he began to enjoy the GPS system. He would ask for directions, and it would let him know where to go, and if he missed a turn, it automatically rerouted him and got him to his destination. Dave is not sure when he started calling the system Maggie, but as a result of his cross-country drive, he now feels as if he is never alone in his car. Maggie is right there, always ready to help him get to where he is going.

The purpose of an information source is to contain information. Many sources can contain equivalent information. This leads to an interesting issue for an individual who requires information to complete a task. When an individual requires information to complete a task, she is then confronted with the decision about which source to select. A basic premise in this research is that individuals will typically select information sources that enable relationship formation. The theoretical justification for this claim will be presented in the next chapter, but the basis for this claim is rooted in human communication patterns.

Individuals not only communicate to share information but also to create feelings of connection (Duck, 1988), affinity, commitment, and attention (Altman & Taylor, 1973; Duck, 1991). Humans are socially-oriented creatures, and it stands to reason that humans are evolutionarily hardwired for socialized information exchange. For example, infants are socialized into an oral world and can speak long before they can write. Furthermore, clinical

diagnoses exist to describe individuals who do *not* respond to social overtures from others or respond inappropriately (Zilberstein, 2006). Yet despite being biologically suited for socialized information exchange, individuals often do not consider this when designing information sources. This research is an important initial first step in considering the development of information sources that are designed to capitalize on the social tendencies inborn to all humans.

Communication exists within a dyad, which implies that a relationship exists between the dyad's interacting partners (Altman & Taylor, 1973; Blau, 1964). While face-to-face interaction is especially rich in establishing connections, individuals also establish connections through IT-enabled communication sources. Blogs, wikis, instant messaging, chat functions, and listservs are forms of technology-based human communication that establish and maintain connections as well as allow for the exchange of substantive information (Nardi, 2005). In fact, the entire Web 2.0 movement exists to enhance the abilities of IT-enabled technologies that allow users to interact, openly share information, and generate the network effects that result from individuals combining their collective knowledge (Parameswaran & Whinston, 2007; Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007).

With so much information available from such a wide array of sources (coworkers, supervisors, company libraries, intranets, the web, etc.), it is imperative to understand how individuals search for information and select the sources from which they obtain information. Interestingly individuals search for information in the same manner that animals search for food (Pirolli & Card, 1999): they access "patches" of information in order to complete particular tasks. Just as animals will stay at a location that they know has a steady supply of food, an individual will stick with a reliable source of information. Sometimes an individual deliberately forms these

patches, such as when a person keeps files nearby for easy reference, while other times an individual must strike out into the "information wild" and track down the information she needs to fulfill an objective. This research focuses on the sources an individual selects in this "information wild," which includes anywhere an individual might choose to access information.

To date, information sources have been classified as being either relational or nonrelational (Rulke et al., 2000). A relational source refers to a human information source that requires one to participate in an interpersonal interaction, such as talking to a coworker. A nonrelational source is an artifact, such as a book, which provides information. Historically, relational and nonrelational information sources have been treated as a dichotomy. However, the fundamental argument that is put forth in this dissertation is that changes in technology have exposed this dichotomy for what it is: a false dichotomy. Rather, relational and nonrelational information sources should instead be treated as endpoints on a continuum. For example, in the opening vignette of this chapter, Dave interacted with Maggie, the GPS in his car. A GPS is clearly an artifact, but Dave interacts with this artifact as if it is another person— or a relational information source. Thus, Maggie exemplifies how the relational-nonrelational dichotomy can be problematic at times. Other instances of this problematic dichotomy include the way individuals personify a car (Aggarwal & McGill, 2007), a robot (Breazeal, 2003b), or even a website (Nowak & Rauh, 2008). It will be argued that source selection can be understood better if the degree to which an information source is "relational" is considered rather than classifying sources as either relational or nonrelational.

One could argue that the GPS from the vignette is now a relational source, but this misses an important point. Individuals will respond differently to sources with differing amounts of relationalism. For instance using a single type of source (a webpage) an individual trying to

plan a cycling trip would relate to maps.google.com differently than map.tourofcalifornia.org. The former simply shows a map that the individual can use to plan their route. They can switch between map, satellite and terrain view to gather information about the planned route. The latter is a mashup site that also uses the same mapping engine but adds the functionality of a blog as well to add additional details about the region. A deeper understanding of how individuals interact with information sources is gained by viewing relationalism as a continuum as opposed to a dichotomy.

The argument is advanced that relationalism will be an important determinant of whether or not an individual selects one information source instead of another. While variables such as quality (O'Reilly, 1982), accessibility (Culnan, 1983), or richness (Daft et al., 1987; Daft & Macintosh, 1981) have been investigated in the literature, these works overlook a key element in source selection: the social aspect of information seeking. Drawing on psychological and interpersonal communication literature, it will be argued that the sociability of a source is a key element that must be considered when an individual chooses an information source. In general, an individual will prefer to select a social information source, regardless of whether that sociability results from actually interacting with another person or from an individual perceiving that she is interacting with another individual.

Communication literature suggests that an individual will respond socially to another's social invitation even if the "other" is actually an inanimate object (Nass & Moon, 2000). For example, individuals responded to social cues given by a robot no differently than the same social cues from a three-year-old child. The field of social robotics is in its infancy hence social robots often make child-like gaffes in interacting with individuals. By making the robot look like a child individuals are more tolerant of these gaffes and will help the robot "learn" the proper

social response (Breazeal, 2003a, 2003b). This finding is at the heart of the new construct, relationalism, which is defined as *the perception that an individual can form a relationship with an information source*[1]. Previous work on information seeking has not considered the relationalism of a source and how it impacts source selection.

From an evolutionary perspective, humans are predisposed to form relationships with each other. This innate tendency also carries over to inanimate objects, and technologies exist to capitalize on this tendency. From this, it can be argued that a new comprehensive model of source selection needs to be developed, a model that explicitly considers the social aspects of source selection. Since individuals are socialized into a verbal, interactive world, this research seeks to answer three questions with regard to an information source's inherent relationalism to understand how individuals perceive information sources and how this impacts source selection (also shown graphically in Figure 1):

1. What are the antecedents to relationalism (i.e., what enables relationship formation)?
2. Do individuals prefer sources high in relationalism?
3. Does the preference for highly relational sources depend on the nature of the information task?

Several theoretical perspectives inform these research questions. Relationalism is about forming a relationship with a source, so theories that involve relationship formation are particularly relevant. Social exchange theory argues that individuals expect information exchanges to be reciprocal. Further when this reciprocity expectation is not met, an individual will generally choose to end the relationship (Blau, 1964; Homans, 1958). Next, uncertainty reduction theory is relevant as it rests on the premise that strangers, upon meeting, go through certain steps in order to reduce uncertainty about one another and to determine if they like or

[1] The theoretical justification for this definition will be presented in the following chapter in Section 2.3.

dislike each other (Berger & Calabrese, 1975). Lastly, anthropomorphism is also relevant in that relationalism applies to both human and nonhuman information sources. Individuals will respond to nonhuman sources as if these sources were another person. While this seems irrational, individuals engage in this type of behavior quite frequently (Epley, Waytz, & Cacioppo, 2007).

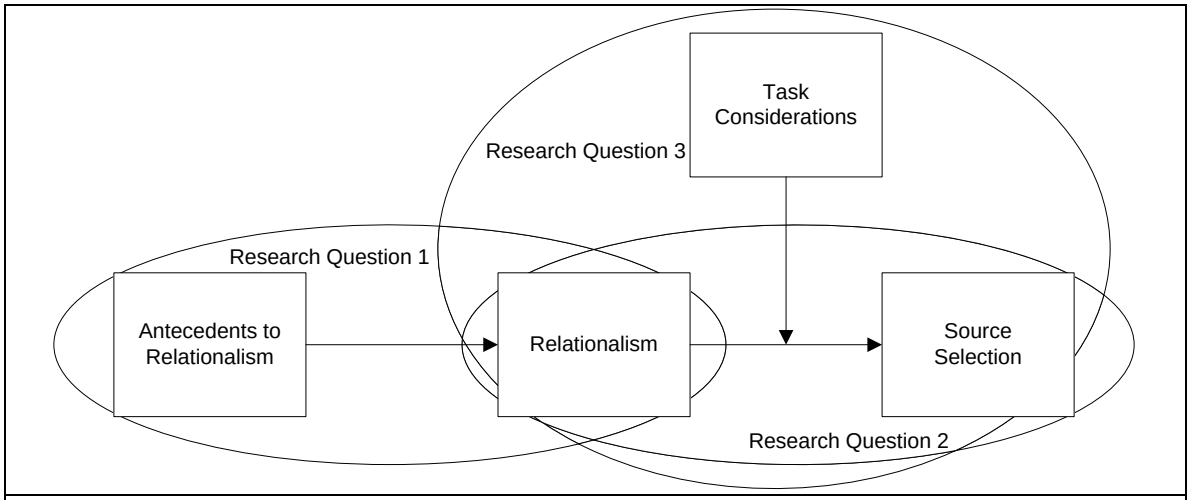

Figure 1. Graphic portrayal of research questions.

1.1 Research Methodology

In subsequent chapters, a research model will be developed that addresses these three research questions. This project will use both experimental design and survey methodologies. The experimental design will provide a set of subjects with a task that will need to be completed by accessing information sources on a website. A variety of metrics will be used to assess the relational nature of the source, its antecedents to "relationalism," and the individuals' selection of the source. The experimental approach allows for a high level of control over the task design, the information source, and other extraneous influences. The second methodology, a broad survey of knowledge workers in business organizations, examines the profiles of sources used in a realistic work setting. Here too, variables pertaining to job context, antecedents to

relationalism and the actual use of various sources will be measured. While the experimental design allows us to improve the internal validity of the model, the survey approach allows for a superior assessment of the external validity. Such methodological triangulation provides for a robust testing of the model and greater confidence in its emerging prescriptions. By incorporating two differing methodologies into this research, the shortcomings of each type are addressed. Experiments are often criticized because they lack realism, which the survey provides. On the other hand, surveys are often criticized for a lack of control, which the experiment provides. The expected results from these differing approaches will bolster the findings of this research (D. T. Campbell & Fiske, 1959a).

1.1.1 Experimental Portion

As will be developed in later chapters, two experiments will be conducted. The first experiment will investigate the relationship between the antecedents to relationalism and relationalism itself. The second experiment will investigate how the nature of the task moderates the relationship between relationalism and source selection.

The experimental conditions themselves will be based on a political website. In Experiment 1, the websites will be designed to emphasize [or deemphasize] relationalism by manipulating the proposed antecedents. Subjects will be exposed to the experimental websites; then, they will rate each website with regards to its relationalism and several theoretically derived antecedents. In Experiment 2, the same websites will be used from Experiment 1. Subjects will be exposed to each experimental website, and then they will be given the task. Subjects will then select a single website as if they were going to use it to complete the task. Both experiments are completely detailed in Chapter 4.

1.1.2 Survey Portion

While the experiments focus on the relationalism of a single type of information source, the survey portion investigates the antecedents, the selection of sources, the task considerations, and the aspects of an individual's personality that impact source selection across sources. Information sources, such as books, trade journals, websites, online forums, or colleagues, do not exist in isolation. Instead, individuals can access equivalent information from an array of different sources. The survey will tap into the varying sources that individuals in business organizations typically use to satisfy their information requirements.

O'Reilly (1982) has theorized that source selection is the result of three basic characteristics. The survey addresses these three areas and further taps into individuals' perceptions of the antecedents of relationalism. The survey will be conducted within the context of a business organization; hence, it will reflect the information-seeking behaviors of information workers. These workers will be recruited from numerous organizations, thereby enhancing the generalizability of the research findings.

1.2 Study Contributions

This research contributes to both research and practice. First, this study's contribution to research will be discussed, followed by its contributions to practice.

1.2.1 Contributions to Research

This study makes several contributions to research. The primary contribution to research is the definition and development of the relationalism construct. In later chapters, a relationalism scale is developed and its reliability and validity are demonstrated. Relationalism is a quality that every information source has to some degree and is more than just the perception that one is interacting with another individual (Short, Williams, & Christie, 1976). Relationalism

incorporates aspects of social interactions, but it also includes other aspects as well. In addition to proposing this new construct, a precise and concise measure of this construct will be provided. Because the dichotomy between relational and nonrelational information can be problematic (as shown in the opening chapter vignette), this measure will be very beneficial for researchers to understand why some sources are selected and others are ignored despite each source containing identical information.

A secondary contribution of this work is the identification of a new information source characteristic. Source characteristics have been shown to be the prominent drivers of source selection, and previous information-seeking studies ubiquitously operationalize information source characteristics as quality and accessibility, which in turn typically correspond to the costs and benefits of information (P. J. Carlson & Davis, 1998; O'Reilly, 1982). Studies in information seeking that focus on the costs and benefits of using a particular source have been referred to as trait theories of source selection (P. J. Carlson & Davis, 1998). The veracity of trait theories has been called into question by other researchers who argue that trait theories do not adequately consider social influences in source selection (P. J. Carlson & Davis, 1998; Morrison & Vancouver, 2000). The construct of relationalism crosses into both of these theoretical perspectives concerning source selection, as it is a source characteristic present to varying degrees in information sources and concerns the sociability of these sources.

Within the information search literature, researchers are separated into two basic camps. The first camp views source selection as a tradeoff between the costs and benefits of source use, while the second camp focuses on the social aspects of the information search (P. J. Carlson & Davis, 1998). These two camps can be described as the economic camp and the social camp. The social streams of research have heretofore centered on using technology to enable

communication among distributed team members (Boyd & Fulk, 1996; Janet Fulk, Heino, Flanagin, Monge, & Bar, 2004; Yuan, Fulk, & Monge, 2007). In other words this line of thought is predicated upon the notion that an individual who requires some information will go to another individual, using technology to get to the other individual if necessary. Further, relationships develop among interacting partners. While humans are genetically hardwired to form social relationships with other humans (Bowlby, 1982), this research expands this line of thought by extending the relationship aspect of source selection to include all information sources, not just human sources. By arguing that an individual can form relationships with any source, new avenues for future research are created. Relationalism, as a construct, spans the gulf between the economic and social camps, and the social aspects of sources can now enter into the cost benefit calculations.

A third contribution is the unique method used to handle how individuals organize themselves in the experimental design. Researchers who investigate social patterns have repeatedly shown that individuals self organize into similar groups (Ingram & Morris, 2007; Lazerfeld & Merton, 1954).

Since an individual cannot truly determine another's values at a glance, outward appearance has become the most common proxy to measure this social tendency (Ingram & Morris, 2007). The experimental websites are designed in such a way that subjects of different political ideologies will respond differently to the same content, thereby allowing the researchers to directly measure this self organizing tendency as opposed to measuring it via proxies such as race (Ingram & Morris, 2007), gender (Brashears, 2008), or personality traits (Granitz, Koernig, & Harich, 2009).

In an information-based world, self organizing on similarities is a potentially dangerous method of forming social groups. Within the information landscape, it is possible to exist almost entirely within a feedback loop shaped by one's own preferences. With the explosion of different information outlets, the era when everyone watched the same news bulletin is over. Instead society is growing more polarized, partially due to the lack of cross pollination of different ideas and perspectives (Hardy & Scheufele, 2009; Kwak, Williams, Wang, & Lee, 2005; Mutz & Mondak, 2006). On sites like Amazon and iTunes, this is treated as a beneficial selling point: it is the basis for "collaborative filtering," whereby the site recommends books and music to an individual based on what people who made the same purchase also enjoyed. This has particular ramifications for those who design information sources. What is the best way to design information sources to provide others with information who want their opinions confirmed not challenged?

In summation, this research is expected to contribute to research in three ways:

1. A new construct—relationalism—will be defined, developed, and measured. This will allow future researchers to use this construct as source selection research moves forward.
2. Elements of both the trait approach to source selection and the social influence approach to source selection will be combined in the development of the relationalism construct.
3. A way to directly measure how others similarly self organize will be developed.

1.2.2 Contributions to Practice

The fundamental hypotheses of this work—that an individual perceives information sources to have varying levels of relationalism and typically prefers information sources with high levels of relationalism—has implications for both the knowledge management and e-commerce fields and by extension to anyone who designs, creates, or manages information

sources. Information managers regulate the flow of information, either electronically or procedurally, within and among organizational members. In many organizations, the rate at which work can be done is limited by the rate of information transfer. The information manager fills the critical role of enabling rapid and accurate dissemination of information to the individuals who need it while maintaining security and creating a structure flexible enough to allow for organizational expansion. Knowledge management and e-commerce are but two specialized examples of areas in which information managers might impact an organization.

Knowledge management initiatives can be categorized into one of two broad areas: the codification approach and the personalization approach. The codification approach to knowledge management is typified by systems that try to create an electronic library with organizational knowledge. In such a system, organizational knowledge is collected, codified, and stored for later use (Hansen, Nohria, & Tierney, 1999). This approach is typified by using a "people-to-documents" strategy whereby knowledge is extracted from the individual who developed it. The knowledge is then stored in a centralized database and can be reused by anyone for various purposes. The advantage of this approach is that it allows many individuals to search for and retrieve codified knowledge without having to contact the originator of the knowledge. The scalability of such a system is limited only by the hardware. If the argument that individuals prefer to socially relate to information sources is correct, then it would be beneficial for organizations to build systems that incorporate relationalism into the design.

The personalization approach focuses on the user and the technology. It is used to enable and enhance person-to-person communication for which the goal is to optimize the transfer of knowledge (Ruggles, 1998). This method assumes that a great deal of organizational knowledge exists within the relationships that individuals form with each other. Further, this

approach assumes that formalized systems are unsuitable for capturing and storing this relationship-embedded knowledge (Brown & Duguid, 1991). Instead, knowledge is transferred organically in these types of knowledge management systems via informal meetings in which individuals discuss common issues.

While communities of practice are notoriously difficult to formalize and manage (Davenport & Prusak, 1998), designing a knowledge management system that enables relationship formation between the individual and the system can enable individuals to feel as if they are still interacting with another person. Such a configuration benefits the organization because it allows for the capture and storage of knowledge that is embedded within the interpersonal relationships as individuals form relationships with the new system. More than sources low in relationalism, sources that are high in relationalism will more readily enable organic knowledge transfer, similar to when individuals hold impromptu undocumented meetings in the halls or across cubicle walls.

This research also has implications for organizations involved in e-commerce. According to Nelson (1974), any product can be classified as a search, experience, or credence good. Search goods include products, such as jewelry or clothing, whose quality can be known with certainty prior to purchase. With an experience good, such as food or wine, quality cannot be evaluated until the product has been used. Finally, credence goods, such as legal services, refer to products whose quality cannot be determined even after they have been used (Brush & Artz, 1999; Hsieh, Chiu, & Chiang, 2005; Jiang & Benbasat, 2007a; Nelson, 1974). One impediment to e-commerce adoption has been the inability of the web to transfer the right type of information for consumers to make informed choices when selecting a good. Sources with more relationalism can better provide the requisite experiences consumers crave, thereby increasing

the range of goods that can be sold online (Daugherty, Li, & Biocca, 2008; Mitra, Raymond, & Hopkins, 2008).

One of the major criticisms of the web and e-commerce is manufacturers' inability to convey product details, which makes it particularly difficult to market experience goods across the web. While many organizations have moved beyond treating the web as a mere electronic catalog, there are some sites that still do not harness the power of this medium as an information source adequately. A relationally-oriented website approximates the brick-and-mortar experience much more closely than a website that is nothing more than an electronic catalog. Organizations can create their sites to include relational aspects and thereby increase their revenues.

In short, this research will help practitioners:

1. Formally build systems designed to enable and enhance the social structures within the organization, thereby increasing the spread of organizational knowledge.
2. Convey additional information in online environments in order to market experience products more effectively.

1.3 Summary & Organization

Chapter 1 has presented the motivation for this research. The argument that the dichotomy of relational and nonrelational information sources is obsolete is advanced, and instead, it is suggested that information sources have varying degrees of "relationalism." It is also argued that individuals will choose sources high in relationalism when all of the other factors related to choice are equal. In Chapter 2, the extant source selection and information seeking research is discussed in an effort to situate this study firmly within the nomological network of the information-seeking literature. In Chapter 3, the theoretical frameworks discussed in Chapter 2 are developed, and specific hypotheses based upon the research

questions will be presented. Because two methodologies are employed in this study, the proposed methods will be presented in Chapters 4 and 5. In Chapter 4, the development of the experimental design is presented and the sample frame, procedures, materials, and sample size calculations are detailed to achieve a desired a priori power level. Chapter 5 contains the development of the survey methodology including the unit of analysis, a discussion of key respondents, a presentation of the survey items, an a priori power analysis, and the statistical analysis plan.

Chapter 2: Literature Review

In this chapter, the information-seeking literature from the information science, psychology, communication, and human-computer interaction fields is reviewed to provide the foundation for the research model that will be presented in the Chapter 3.

First a universal search process is described (Choo, 2006), which allows for the boundary conditions of this study to be defined through the selection of information sources. Next the drivers of information-source selection are reviewed. O'Reilly's (1982) classification system, which identifies three broad drivers of source selection, is used to guide this discussion. Finally, the literature surrounding relationship development is reviewed. This discussion includes not only how individuals form relationships with each other but also how relationships are formed with nonhuman entities.

2.1 The Search Process

In this section, the most prominent accounts of the information-seeking process are reviewed and the argument that there is a universal commonality among each of these accounts is advanced. Information seeking is the process of obtaining information from the environment (Choo, 2006). Inherent in this definition is the assumption that information seeking is a process, a process that is often nonlinear (Ellis, 1993; Kuhlthau, 1991).

All information seeking behaviors can be described in relation to three basic steps: 1) perception of the need for information; 2) the search for information; and 3) the use of information (Choo, 2006). A model of this process is shown in Figure 2. Information need is the set of circumstances that instigates the individual to search. Information search[2] is the stage in

[2] A distinction between information search and seeking needs to be made. Information seeking is a process that covers all of the information behaviors an individual engages in across the entire process.

which individuals go to sources in an effort to find information that satisfies the original need. Information use ends the process and is the stage where the individual extracts the information from the source and addresses the originating need.

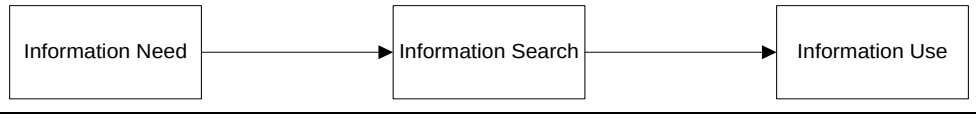

Figure 2: Simple representation of the information search process

Many previous models of information-seeking behavior focus on the information-use portion of the process. These models focus on the extraction of information from a source and ignore source selection (Belkin, Marchetti, & Cool, 1993; Chi, Gumbrecht, & Hong, 2006). Such models do not consider the array of sources typically available to individuals (see Figure 2).

However, there are three different models that do address the entire seeking process and are reviewed here. Kim and Soergel (2005) proposed a model of the information-seeking process arguing that there are five stages for finding information: problem identification, information searching, problem analysis, writing, and dissemination. Another model, developed by Kuhlthau (1991) claims the stages in the information-seeking process are initiation, selection, exploration, formulation, collection, presentation, and assessment. Lastly Ellis's (1993) model of information seeking claims that an individual passes through six stages to find information—starting, extracting, monitoring, differentiating, browsing, and chaining—though the order in which individuals move through these stages depends on the task.

The three models briefly covered in the preceding paragraph can all be mapped to the three basic steps of information seeking presented in this paper (see Table 1). Each of these

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Information search is a subset of the seeking process and only includes the behaviors an individual engages in while accessing sources. Seeking refers to the entire process, while search refers explicitly to the center box in Figure 2.

models claims that the search process begins with the recognition that information is needed: - problem identification (S. Kim & Soergel, 2005), initiation (Kuhlthau, 1991), or starting (Ellis, 1989; Ellis, Cox, & Hall, 1993). The models by Kuhlthau (1991) and Ellis (1993) detail the information-searching stage more than other. However, each model suggest that an individual typically engages in two behaviors during this stage: locating an information source and then searching for the desired information. The final step of the seeking process is using the information to address the original need. All three models put more emphasis on this portion of the process than does Choo (2006), but the important point is that the information is used. Kim and Soergel (2005) and Kuhlthau (1991) include dissemination of the information to others as part of the use portion of the process, while Ellis (1993) ends the process at addressing the originating need.

Step	Choo (2006)	Kim & Soergel (2005)	Kuhlthau (1991)	Ellis (1989)
1	Information need	Problem identification	Initiation	Starting
2	Information search	Information searching	Selection Exploration Formulation Collection	Browsing Monitoring Chaining
3	Information use	Problem analysis Writing Dissemination	Presentation Assessment	Extracting Differentiating

Table 1. Cross referencing of information search process terminology.

Where Choo (2006) identifies the second step of the seeking process as information search, Kuhlthau (1991) divides search into four different activities, while Ellis (1989) divides it into three activities. From this, it can be concluded that information search changes as an individual spends more time in the search phase. Individuals become more efficient at selecting sources that are more likely to contain the information they require; further, individuals become

more selective as the search portion of the process continues (Wood et al., 2001). All of this indicates that while information search is a descriptive label, this portion of the process warrants a closer investigation.

Within the search portion of the information-seeking process, there are three main decision points[3] (see Figure 3 ; (Sacchi & Burigo, 2008). The first choice one must make is the decision about where to search. At this point an individual chooses between an internal source (i.e., relying on one's current knowledge) or an external source (i.e., relying on another's knowledge) (Levitt & March, 1988). The second decision point deals with selecting an information source, while the third decision is the point where an individual chooses to stop searching. The second decision point will be the focus of this research because this is where an individual selects the information sources.

The preceding discussion provides two major takeaways. First information search and source selection are part of the larger information-seeking process. The research model developed in Chapter 3 will address the context driving the search process, while keeping the focus primarily on the search portion of the seeking process. Second, the search portion of the information-seeking process is of primary interest. This is where an individual decides which source to access as opposed to deciding to continue search.

2.2 Drivers of Information Source Selection

Prior work has broadly identified three characteristics as the major drivers of source selection: the task, the seeker, and the source (O'Reilly, 1982). Task characteristics are the

[3] Since this research is focused on an individual selecting an *external* information source, the fourth decision point (confidence in one's own knowledge) is not considered. It is true that an individual can initially select an internal source and then subsequently decide to go to an external source. This option is shown in Figure 3 but is not explicitly considered in this research.

elements that define the task and have been investigated in terms of complexity and uncertainty (Cannon-Bowers, Salas, & Converse, 1993; Culnan, 1983; Zeffane & Gul, 1993).

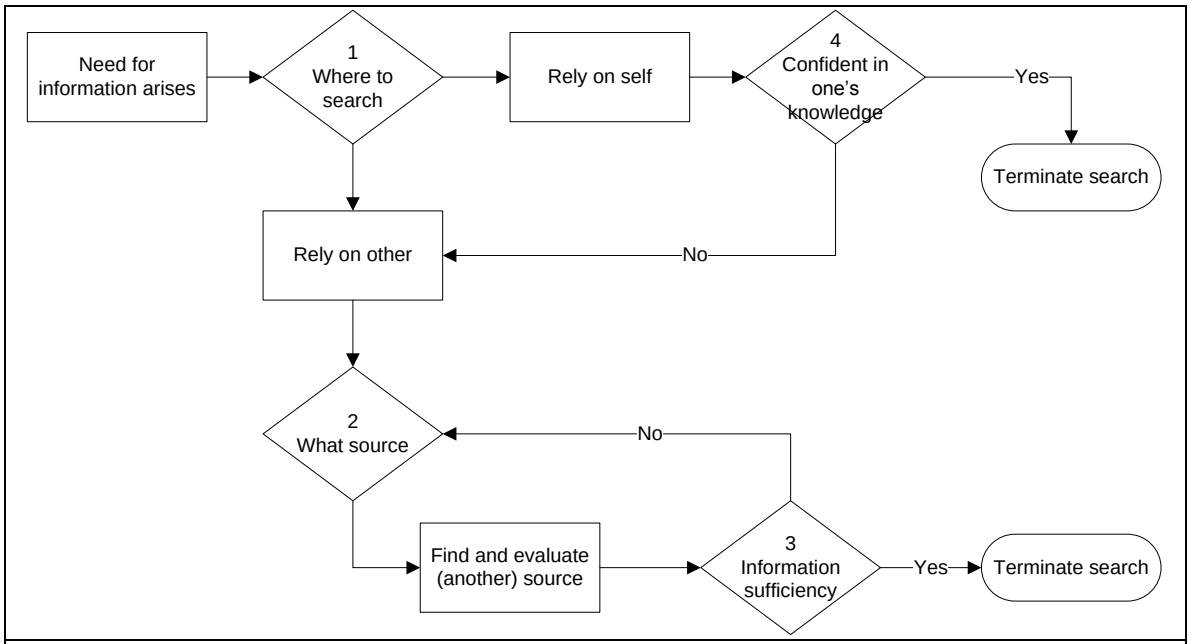


Figure 3. Decision points in the search process.

Seeker characteristics are the individual differences between people that lead them to choose different information sources to fulfill their needs (Hollingshead, 1998; O'Reilly, 1982; O'Reilly, Chatman, & Anderson, 1987). These are typically operationalized along demographic lines, but some notable exceptions include differences in motivation (Morrison, 1993), transactive memory (Littlepage, Hollingshead, Drake, & Littlepage, 2008), and the need for achievement (Vancouver & Morrison, 1995). Lastly, source characteristics are the source features an individual evaluates when deciding to use a particular source. Source characteristics are ubiquitously operationalized as information quality and source accessibility (P. J. Carlson & Davis, 1998). Accessibility is viewed as the costs of getting to a source, while quality is seen as the benefits reaped from using the source. Individuals will typically select the highest quality information they can easily access (Allen, 1984; P. J. Carlson & Davis, 1998).

2.2.1 Task Characteristics

Task characteristics include the context in which the individual is involved (O'Reilly, 1982). While this research focuses on source selection, the factors driving information need cannot be completely ignored because information seeking occurs within a specific context and task characteristics serve the dual purpose of helping drive source selection as well as providing the context for the seeking process (Choo, 2006). While previous works have explored the relationships among task complexity, uncertainty, and source selection with the results overwhelmingly demonstrating that as tasks become more complex or uncertain individuals require *more* information (Cannon-Bowers et al., 1993; O'Reilly, 1982; Zeffane & Gul, 1993), the effect of task characteristics on the *type* of source selected has not been investigated.

Task characteristic	Definition	Example	References
Task analyzability/task determinacy	The degree to which programmed solutions are available to solve the problem.	When integrating two systems, a bug is discovered, but upon searching for information, it turns out to be a known bug with a well known solution.	(Daft & Macintosh, 1981; Perrow, 1967; Zeffane & Gul, 1993)
Task variety/task nonroutineness	The number of exceptions that arise during the task that require an individual's direct attention.	Troubleshooting and debugging an improperly validated system.	(Perrow, 1967; Zeffane & Gul, 1993)
Task complexity	The results of combining the four different dimensions of multiple paths, multiple outcomes, conflicting interdependencies, and probabilistic linkages. These are shown in Table 3.	Maximizing the returns on an investment portfolio.	(D. J. Campbell, 1988)

Table 2. Definitions of task characteristics.

While a key argument of this work is that most task characteristics entail different aspects of complexity, a review of the different types of task characteristics identified in the literature will be presented. In addition to complexity, the literature identifies task analyzability and task variety as two other types of task characteristics. These characteristics are presented and defined in Table 2.

Perrow (1967) argues that task analyzability is one of two basic task characteristics. Task analyzability (also called task determinacy in the literature) originated from organizational theories as a determinant of task performance and is defined as *the degree to which programmed solutions are available to solve problems* (Perrow, 1967). Task analyzability impacts information processing in that it is associated with uncertainty, which requires an individual to obtain more information to address the issue (Daft & Macintosh, 1981; Zeffane & Gul, 1993). Daft and Macintosh (1981) also make a connection between task analyzability and information equivocality. Equivocal information requires a context for understanding the information. Equivocality equates to confusion, disagreement, and a lack of understanding about the issue at hand; therefore, to address the information need, an individual has to define the context better in order to make meaningful source-selection decisions (Daft et al., 1987). Daft and Macintosh (1981) find that high analyzability tasks need unequivocal information, such as quantitative data, whereas low analyzability tasks need more equivocal information that provides richer cues in a qualitative manner. Low task analyzability has also been conceptualized as high task complexity (Haerem & Rau, 2007; Rice, 1992).

Task variety is the other basic task characteristic and is defined as *the number of exceptions that arise during the task that require an individual's direct attention* (Perrow, 1967). According to this view, information is required only when something unexpected or out of the

ordinary happens. According to Perrow (1967) the information-seeking process is undertaken by the individual in response to the occurrence of a nonroutine event.

Task complexity has been theorized in several different ways in the literature, which has lead to a situation in which several different terms are used to describe it, such as analyzability (Perrow, 1967; Rice, 1992), demands (Jimmieson & Terry, 1999; Karelaia & Hogarth, 2008; Payne, Bettman, & Johnson, 1993), ill structuredness (Devine & Kozlowski, 1995), variety (Perrow, 1967), and routineness (Daft & Macintosh, 1981). Regardless of the term used, all the aforementioned aspects are included in Campbell's (1988) conceptualization of task complexity.

In a review of task complexity, Campbell (1988) argues that complexity is comprised of four basic components: multiple paths, multiple outcomes, probabilistic linkages, and conflicting interdependencies. Table 3 reviews and defines these dimensions. Multiple paths are defined as the number of ways to complete the task. Multiple paths can increase complexity in two ways—when many paths appear to lead to the goal but only one path actually does or when an efficiency criterion is embedded in the task and each potential path must be evaluated with regards to the efficiency criterion. Multiple outcomes are defined as the number of desired outcomes of a task. The relationship between multiple outcomes and complexity stems from the amount of information an individual will need to process to implement the outcome which increases as the number of outcomes increase. When the outcomes are inversely related, Campbell (1988) refers to this as another type of complexity called conflicting interdependencies. Conflicting interdependencies occur when achieving one outcome necessarily precludes completing another outcome. An earlier experiment by Campbell (1984) demonstrates this phenomena as subjects had to accomplish a scheduling task for which individuals had to process orders quickly while simultaneously minimizing the labor costs

associated with processing the orders. Probabilistic linkages are the final type of complexity, which occur when the path between activities and solutions cannot be determined with certainty. This is akin to Perrow's (1967) analyzability, as with an analyzable task, the path of activities can be determined with certainty.

In this framework, an increase in any of the dimensions results in an increase in the complexity of the task (D. J. Campbell, 1988). Previously, evidence demonstrated that the prior conceptualizations of task characteristics are subsumed within task complexity. As Perrow (1967) defines task analyzability, it is contained within the probabilistic linkages in Campbell's (1988) framework. A highly analyzable task is one without probabilistic linkages. Further, as Perrow (1967) defines task variety, it is subsumed in either multiple paths or probabilistic linkages.

Complexity Dimension	**Definition**	**Examples**
Multiple paths	The number of ways to achieve a desired outcome.	A game of chess. Many thousands of ways to win exist.
Multiple outcomes	The number of desired outcomes.	Choosing a house to purchase. Buying the house that satisfies the most a priori criteria.
Probabilistic linkages	The path to the goal cannot be determined with certainty.	Predicting the stock valuation of an organization in the future.
Conflicting interdependencies	A negative relationship exists among the desired outcomes (i.e., competing goals exist).	Scheduling employees in such a way that labor costs are minimized, but orders are processed as soon as they arrive.

Table 3. Dimensions of complexity identified by Campbell (1988).

When an exceptional event occurs that causes some sort of impediment that an individual has to acknowledge when completing the task, this can be viewed as the instigating information need that increases the information load of the task. This means that as additional information is required to address the unexpected event, the individual searches for more

information. Addressing such unexpected events is akin to realizing that there is more than one way to address an issue (i.e., there are multiple paths) or that the path to the goal cannot be determined with certainty (i.e., there are probabilistic linkages). Hence, task analyzability and variety are suggested to be components of task complexity.

The complexity of the task provides the context for the information seeking and serves as a driver for source selection (O'Reilly, 1982). With respect to source selection, complex tasks require more information than simple tasks (D. J. Campbell, 1984; D. J. Campbell & Ilgen, 1976). In addition to requiring more information, the types of sources individuals consult when confronted with different task complexities changes as well (Byström & Järvelin, 1995; Tiamiyu, 1992). For instance, when investigating the information-use practices of government workers, Byström and Järvelin (1995) found that individuals turned toward interpersonal sources for certain types of complex tasks. On the other hand, when the tasks were simple, individuals consulted nearby documents.

When an individual is faced with a task for which multiple paths or outcomes is an issue, then complexity is going to be a result of the increased amount of information, which in turn requires processing in order to arrive at a solution. For example, using the scenarios laid out in Table 3, a game of chess is more complex when both players have more pieces on the board, or selecting a house is more complex when more criteria have to be satisfied (e.g. neighborhood, square footage, number of bedrooms, number of bathrooms, property taxes, etc.) (Cannon-Bowers et al., 1993).

Conversely when an individual faces a task for which probabilistic linkages or conflicting interdependencies are issues, then this type of task requires an individual to exercise judgment. For example, again using the scenarios laid out in Table 3, it would be easier to predict the value

of an organization in the next quarter as opposed to valuing it five years in the future. Similarly minimizing accrued labor costs while maximizing speed of service requires an individual to make tradeoffs for each goal, and doing so requires expertise, experience, and judgment. The notion that complexity is a function of the independent factors of the amount of information processing and judgment will be revisited in the next chapter.

In all, the prior task characteristics identified in the literature are subsumed within Campbell's (1988) complexity theory. Further, as tasks become more complex the amount of information an individual searches for increases (D. J. Campbell, 1984; D. J. Campbell & Ilgen, 1976). Finally, when complexity due to probabilistic linkages increases, individuals turn to others to satisfy their information needs. In terms of this research, task characteristics are expected to influence the effect that relationalism will have on source selection because as complexity increases, it seems probable that an individual would prefer a source that has more relationalism.

2.2.2 Seeker Characteristics

Previous work involving seeker characteristics has fallen into two broad categories. The first includes seeker characteristics that are demographically oriented, while the other includes characteristics that are psychologically oriented. Prior works have investigated a wide array of demographic characteristics, such as seekers' age, gender, education, and job tenure (O'Reilly, 1982). The overwhelming results of these types of studies suggest that demographic characteristics are associated with how much information an individual seeks or how many sources they consult and not with the type of source selected (Downing, Moore, & Brown, 2005; Morrison, 1993, 2002; Morrison & Vancouver, 2000; O'Reilly, 1982; Rice, 2008; Vancouver & Morrison, 1995; VandeWalle, Genesan, Challagalla, & Bron, 2000).

However, the individual characteristics that could potentially impact the *type* of source a person selects have not yet been investigated. Since relationalism refers to forming a relationship with a source, seeker characteristics that impact how an individual forms a relationship with another are particularly relevant. Individuals enter into information-seeking processes with unique personal backgrounds, but all have one thing in common - insufficient background knowledge in the problem domain within which they are working (Kwasitsu, 2000; V. D. Miller & Jablin, 1991; VandeWalle et al., 2000).

In addition, dispositional factors affect information seeking because they affect a person's level of motivation to seek information (i.e., their willingness to bear cost in the seeking process). Prior works that investigate dispositional factors and source use show that shy or anxious individuals use internet applications no differently than others who are not shy or anxious (Scealy, Phillips, & Stevenson, 2002). In addition, a study by Mourali, Laroche and Pons (2005) showed that individuals who were susceptible to interpersonal influence used interpersonal sources for information more frequently. These results indicate that disposition influences source selection. Since this research focuses on individuals socially relating to information sources, two broad areas have been identified that are relevant to how individuals socially relate to others: personality and culture.

2.2.2.1 Individual Personality Traits

Personality is the organized set of characteristics an individual possesses that uniquely influences her cognitions, motivations, and behaviors in various situations (Ryckman, 2004). Trait theories of personality all contend that individuals possess temporally stable characteristics. These characteristics, in turn, influence behavior across time and situations (Derlega, Winstead, & Jones, 1991). Numerous trait theories of personality exist, but this

research specifically focuses on introversion/extraversion—a dimension that addresses how individuals socially relate to others (Eysenck, 1967; Eysenck & Eysenck, 1985). Introversion/extraversion was selected because this dimension is common to many different personality theories (where little agreement generally exists), and this was taken as evidence that it is a universal trait among humans (Cattell, Eber, & Tatsuoka, 1970; Eysenck, 1967; Eysenck & Eysenck, 1985; Ryckman, 2004). Furthermore, introversion/extraversion is one of the dimensions in the Big 5 personality theory which is generally regarded as one of the most valid, reliable and comprehensive models of personality (Barrick & Mount, 1991). In addition to its universality among different personality theories, introversion and extraversion directly relate to how an individual relates to other individuals, which should impact preferences for sources designed to simulate another individual.

There are strong theoretical reasons to believe that introversion is related to communication behavior and information-source selection. On the other hand, Eysenck (1967) ties extraversion closely to cortical arousal and brain activity. Extraverts have a chronically low level of cortical arousal compared to introverts (Gale, 1973), and this low arousal level leads to an increased need for external stimuli. Typically, the increased stimulus comes from interacting with others. Conversely, introverts tend to avoid external stimuli because of high levels of cortical arousal and sensory overload. MRI brain scans have confirmed the differences in brain activity between introverts and extroverts. Additionally, introverts have higher brain activity than extraverts when both are placed in the same setting (Kumari, Ffytche, Williams, & Gray, 2004; Stenberg, Risberg, Warkentin, & Rosen, 1990).

These differences between introverts and extraverts can be observed in various aspects of individual behavior. The traits positively associated with extraversion are sociableness,

liveliness, activeness, assertiveness, sensation seeking, carefreeness, dominance, and venturesomeness (Eysenck, 1990). In McCrae and Costa's (1985) neuroticism-extraversion-openness model, extraversion integrates warmth, gregariousness, assertiveness, activeness, excitement seeking, and positive emotions. Cropanzano, James, and Citera (1992) equated extraversion and a tendency to approach or look for positive stimuli. Introversion is the opposing side of the same dimension. In terms of communication, individuals' positions on the extraversion-introversion dimension seem to have two different kinds of implications. First, the traits of sociableness, gregariousness, liveliness, and warmth would suggest that extraverts are more satisfied working with others than introverts who prefer working alone. It is possible that these tendencies would carry over to selecting information sources that convey relationship elements.

Prior work regarding introversion and information seeking is nonexistent. This is hardly surprising since typical information-search studies have focused on how much information is sought. There is no reason to believe introverts and extraverts would differ in terms of the amount of information they seek. However, as the next chapter will develop, there are theoretical reasons to justify that the type of source selected would be different between introverts and extraverts.

2.2.2.2 Individual Cultural Aspects

Cultural aspects are also expected to impact source selection. Schein (1992, p. 12) defines culture as "a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems." This definition is equally applicable to all cultural

levels, ranging from small groups to organizations to nations. Cultures differ in the extent to which they emphasize cooperation and competition. At the group level, cultural aspects of cooperation and competition are referred to as individualism and collectivism, while at the individual level these same tendencies are called allocentrism and ideocentrism (Harry C. Triandis, Bontempo, Villareal, Asai, & Lucca, 1988).

Some individuals are more inclined to go to others when they need information, while others are more inclined to be self-reliant or do without information. This is akin to the first decision point in Figure 3 where an individual decides between going to a source and relying on herself. According to Triandis et al. (1988), allocentrists have a strong sense of "we," while ideocentrists have a strong sense of "I." Allocentrists have strong ties to their group and consult with others before proceeding with a task, while ideocentrists are much more likely to develop and implement a course of action without consulting others (Moorman & Blakely, 1995; Wagner, 1995).

There are also differences in the way ideocentrics and allocentrics search for information (de Mooj, 2004) in terms of both the types of information they seek and the types of sources they select. When the goal was to find information about cars, ideocentrics preferred detailed product attributes like engine size, mileage, and warranty information, while allocentrics wanted pictures of the vehicle and the context in which the car was designed to be used (de Mooj, 2004). Not only were differences seen in the type of information sought, differences were also seen in the type of source selected. Ideocentrics tended to prefer print sources, while allocentrics preferred interpersonal sources (de Mooj, 2004; Laroche, Kalamas, & Cleveland, 2005).

As discussed above, an individual's psychological characteristics are expected to play a role in source selection. Introverts avoid interpersonal interaction and, therefore, do not form relationships as quickly or as easily as extroverts. This tendency is expected to impact such individuals' selection of sources designed to convey relationship content. Furthermore, ideocentrics use a different type of information, preferring more explicit and verifiable information than allocentrics, even if the task is the same. The preference for different types of information also extends to source selection, with allocentrics having a greater preference for interpersonal sources in comparison to ideocentrics (Laroche et al., 2005).

2.2.3 Source Characteristics

In the past, source use was conceptualized as a tradeoff between quality and accessibility, with quality representing the benefits and accessibility representing the costs (P. J. Carlson & Davis, 1998; O'Reilly, 1982). Individuals want high quality information that they can access and use. In other words, the quality of the information and the accessibility of the source are driving factors in selection (Allen, 1984; O'Reilly, 1982).

Inherent in this view of costs and benefits is the idea that information can have objective characteristics, such as relevance, accuracy, comprehensiveness, or timeliness (Swanson, 1987; Zmud, 1978). These aspects of quality are weighed against the costs of accessing them, and research has shown that individuals will choose lower quality information over higher quality information provided it is more accessible (Allen, 1984; Culnan, 1983; O'Reilly, 1982).

Relationalism is proposed to be a new source characteristic and is rooted in two separate research findings. First, in the course of studying how to best store and organize information for easy retrieval, researchers found that some individuals rely heavily on

interpersonal communication instead of formalized information systems (Gerstenberger & Allen, 1968). Second, more recent research found that individuals perceive differences in accessibility for different types of sources (Zimmer, Henry, & Butler, 2008). In this study, the accessibility of other people as information sources had less impact on use than it did for artifact-based sources such as books or journals.

Interpersonal communication is the process of sending and receiving information between two or more individuals and is generally comprised of two types of content. The first is the actual content of the message, and the second is the meta-content of the message (Burgoon & Hale, 1984; Burgoon & Le Poire, 1999). In other words, message content can be broken up into what is said (the actual content) and everything else (the meta-content). Figure 4 through Figure 6 show examples of the communication process and how relationalism influences it. These figures use face-to-face communication as an example, but this applies to all types of communication. In a typical interpersonal information exchange, there are up to five elements required to allow the interaction to occur (see Figure 4). These elements include the individual who sends the information; an individual who receives the information; the actual content (the straight line); the meta-content (the wavy line); and in cases where the interaction is mediated, the medium the individuals are communicating through (e.g. phone, IM software, webcam etc.). Relationalism is represented as both the wavy line and the dashed medium line in Figure 4. The meta-content refers to the unspoken aspects of the message, body language, tone of voice, and other nonverbal cues. The medium also plays a role in relationalism, though this is beyond the scope of this study, for instance when interacting with another individual, typing messages over IM would have less relationalism than using a webcam. The medium the source is presented

through can impact perceptions of relationalism, but the goal of this research is to consider all sources and only a subset of sources can have their relationalism impacted via a medium.

Figure 5 shows a low relationalism source. This type of source lacks relational content and, in this case, would be lacking in the qualities that will be discussed in Section 2.5. Going back to the typical interpersonal interaction, relational content is the additional messages an individual receives when interacting with another person, such as gestures or tone of voice, that have nothing to do with the information itself but serve to add additional richness to the interaction. In contrast, Figure 6 shows a source high in relationalism for which the relational content and the qualities detailed in Section 2.4 are present. This research investigates the causes of the differences in individuals' perceptions that a source has low relationalism (Figure 5) or high relationalism (Figure 6).

This section contributes to the understanding of what drives source selection. To design a complete model of source selection, task, seeker, and source characteristics must be addressed. Task characteristics are part of the information need context that the individual brings to the search portion of the seeking process. This section also lays the groundwork for the aspects of interpersonal communication that make it unique. The next section lays the theoretical groundwork for the definition relationalism.

2.3 Theoretical Perspectives Impacting Relationalism

Historically there have been two main theoretical perspectives on source selection, trait theories and social interaction theories (P. J. Carlson & Davis, 1998). The difference between these views is trait theories argue that source selection depends on traits inherent to the source and the requirements of the task. On the other hand, social interaction theories posit that social influences determine source selection. With repeated interactions, individuals eventually

ascribe characteristics to these sources which, in turn, influence source selection. From this view selection is the result of a self-referential cycle where initial selection leads to ascribing characteristics which in turn leads to an increase in the likelihood of continued selection. Prior to this work, these two views of selection have existed separately from one another.

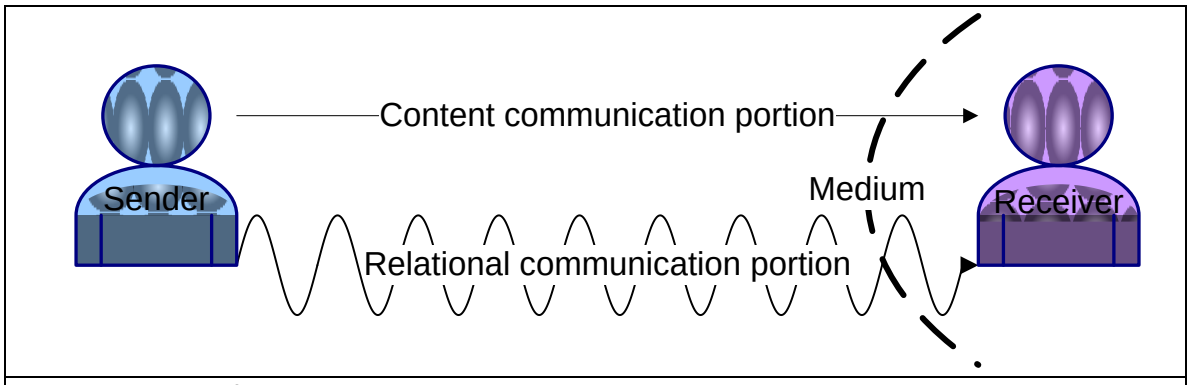


Figure 4. Model of interpersonal communication.

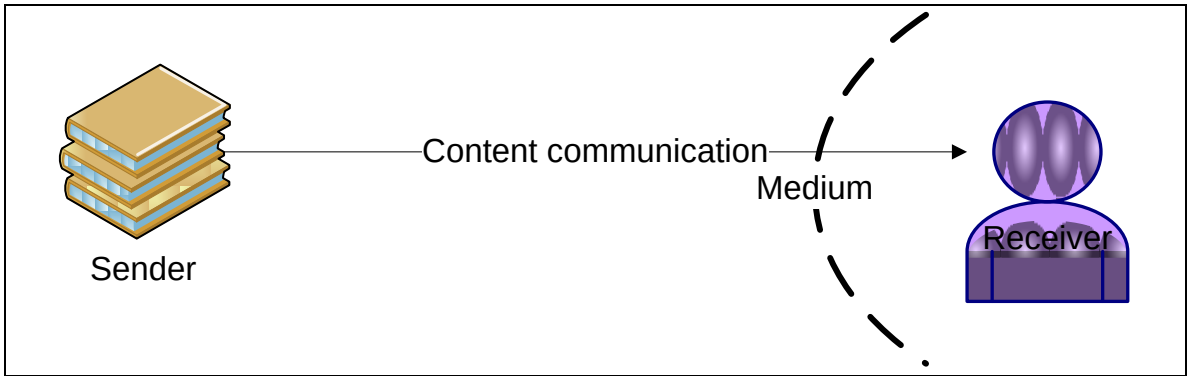


Figure 5. Model of low relationalism source.

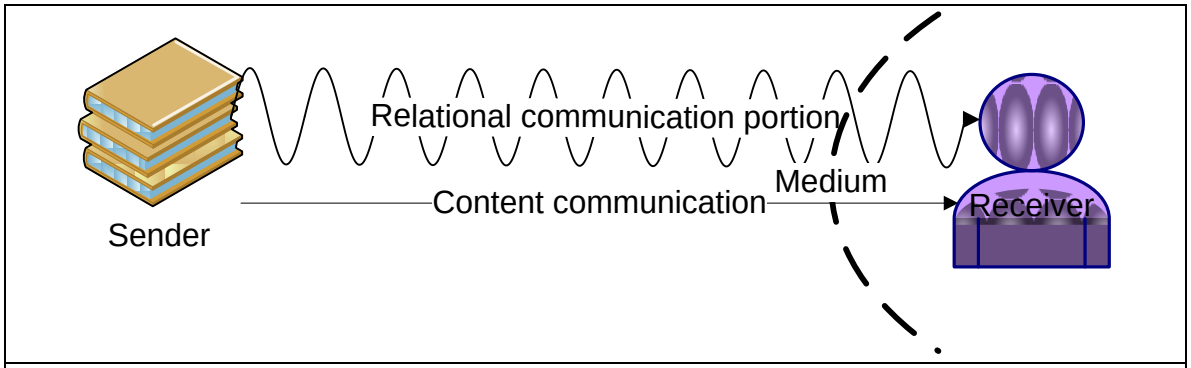


Figure 6. Model of high relationalism source.

As proposed, relationalism blurs the line between the trait and social interaction boundaries. As defined, relationalism can be viewed as a source trait and considered in terms of a cost and benefit analysis much like other established traits of selection such as information quality and accessibility (O'Reilly, 1982). Individuals regularly consider the costs of maintaining a relationship against the benefits of maintaining a relationship when selecting a particular source. Conversely, relationalism integrates well with social interaction theories. Social interaction is grounded in viewing communication as a matrix of interactions (J. Fulk, Steinfield, Schmitz, & Power, 1987). According to this view, meaning is socially constructed and results from the initial and continued relationships that form between interacting partners. Relationalism is the perception of a relationship with a source. Inherent in this definition is the individual will create meaning on the basis of the information conveyed via the relationship she has with the source.

As previously discussed, communication is comprised of two types of content: the message content and the meta-content, the latter being the nonverbal and emotional aspects of the message (Burgoon & Hale, 1984; Burgoon & Le Poire, 1999). Historically, only humans were capable or sending messages with meta-content, but this is changing. Social robots are beginning to communicate on both levels (Breazeal, 2003b). Humans seem to be evolutionarily driven to relate to things in social terms. Clearly nonhuman objects, such as automobiles and robots, are often ascribed human-like qualities and emotions (Aggarwal & McGill, 2007), and some researchers argue that interacting with technology is a fundamentally social experience (Nass, Steuer, & Tauber, 1994; Takeuchi & Katagiri, 1999). For example, experimental evidence demonstrates that individuals respond politely to computers when the computer initiates a polite social action (Nass & Moon, 2000). Not only do individuals respond politely, but the

interaction closely mirrors interpersonal communication where the individual and the computer take turns sharing information with each other just like a conversation between individuals (Moon, 2003; Nass & Moon, 2000). These interactions serve dual purposes. First the interaction occurs to share information; however, when new partners interact, that is when the interaction serves a second purpose. With newly interacting partners, communication occurs for the two individuals to learn about the other partner as well. Learning about the other partner makes the exchange of information more social and reduces uncertainty about the source as well (Antheunis, Valkenburg, & Peter, 2007; Knobloch, Miller, Sprecher, Wenzel, & Harvey, 2008). The rest of this section will review three basic perspectives that are useful in understanding dyadic communication: social exchange theory (Blau, 1964), uncertainty reduction theory (Berger & Calabrese, 1975), and anthropomorphization (Epley et al., 2007).

2.3.1 Social Exchange Theory

Social exchange theory (SET) is a useful lens to investigate dyadic relationships among interacting partners. It posits that relationships evolve over time into trusting, loyal commitments (Blau, 1964; Thibault & Kelley, 1959). For this to occur, the dyad must abide by certain rules of exchange, the most important being reciprocity (Homans, 1958). Reciprocity occurs when an action by one individual leads to a response by the other (Thibault & Kelley, 1959). The response is understood by both parties to be something similar, such as when one individual introduces themselves and shares their name, the other individual feels beholden to share their name in response. This exchange of information is not a formalized, contracted, negotiated exchange; instead the social norms surrounding interpersonal exchanges informally dictate a quid pro quo arrangement (Cropanzano & Mitchell, 2005; Gouldner, 1960). Further, it

is expected that these interactions will lead to the formation of affection and trust between the interacting partners provided the norms are not broken.

The reciprocity concept is valid whether the interacting partners are human or machine. When technology possesses characteristics normally associated with humans, individuals respond by exhibiting social behaviors and making social attributions toward the technology (Moon, 2003) . For example, individuals will disclose more information and more sensitive information if the computer offers something similar first (Nass & Moon, 2000). The key to the success of this type of communication is that the exchange follows commonly accepted social guidelines.

Social exchange theory informs this research in that is sheds light on the communication process. When two individuals first start to relate to each other, the information exchanged is not very sensitive and is often very superficial. Further, SET purports that individuals take turns when interacting. This principal of reciprocity is critical if an individual is to feel that she can form a relationship with a source. Relationships are formed through communication, which is a requisite condition for forming relationships with another individual or a source. The next section discusses the purpose of communication with an emphasis on the interaction that occurs when individuals initially meet.

2.3.2 Uncertainty Reduction Theory

When meeting another person for the first time, an individual attempts to reduce the uncertainty surrounding the other person. Uncertainty Reduction Theory (URT) focuses on the interactions between individuals when they first meet one another. It states that there is a degree of uncertainty when two individuals meet for the first time and that both people are driven to reduce the uncertainty about the other by exchanging information (Berger &

Calabrese, 1975). This information exchange reduces the inherent uncertainty to acceptable levels. Further, research has shown that individuals are more attracted to each other when the uncertainty about the other has been reduced (Berger & Calabrese, 1975; Clatterbuck, 1979; Infante, Rancer, & Womack, 1997). When uncertainty is reduced, liking and trust determinations can be made.

When individuals meet, both parties use visual indicators to form expectations about one another and to reduce uncertainty about the other individual. A common visual indicator, for example, is the physical form of the other individual. These cues are the easiest to detect and are processed automatically, requiring almost no information-processing resources from the evaluating individual; therefore, individuals rely heavily on appearance when perceiving and evaluating others upon their initial meeting (Bull, 1983; Bull & Rumsey, 1988; Burgoon, 1994; Patterson, 1995; Tagiuri, 1958). The drive to reduce uncertainty is so strong that individuals will attribute meaning to interactions with nonhuman entities, such as animals (Eddy, Gallup, & Povinelli, 1993), and can even attribute meaning to other nonliving entities, such as computers (Moon, 2003; Nass & Moon, 2000; Nass et al., 1994) or organizations (Levinson, 1965).

If the uncertainty is reduced to an acceptable level, URT then posits that the likelihood of future interactions increases (Berger, 1979; Berger & Calabrese, 1975). Relationships are formed from these repeated interactions. Hence, if an individual feels like there is a relationship between themselves and the source; it stands to reason that the source must reduce the uncertainty between newly interacting partners. Sources with high levels of relationalism will reduce the uncertainty in the relationship between the seeker and the source more effectively than low relationalism sources.

2.3.3 Anthropomorphism

Anthropomorphization occurs when an individual attributes human characteristics to nonhuman phenomena (Guthrie, 1993). Individuals readily do this, which begs the question: why is the tendency to attribute human characteristics to animals so prevalent? Gallup (1985) contends that anthropomorphism is a byproduct of the evolutionary process that gave rise to self-awareness. Organisms that can conceive of themselves can infer the experience of others by using their own experience as a model (Gallup, 1982; Humphries, 1984). Given that an individual would be aware of her own mental state and its relationship to external events, she now has a means of modeling how others might react to similar events. Using one's own experience as a means of anticipating what others might do, how they might feel, and what they might be thinking could have been a significant advantage when it came to competition for scarce resources. Knowledge of one's self, in other words, is the vehicle that provides the means of achieving an intuitive knowledge of others. Anthropomorphism is an extension of this introspective modeling capacity.

Individuals easily anthropomorphize animals (Epley et al., 2007), but it has also been demonstrated that individuals also do it to technology (Caporael, 1986; Gong, 2008; Nass & Moon, 2000). While the general definition of anthropomorphization refers to attributing human characteristics to nonhuman phenomena (Guthrie, 1993), others have offered a competing view of this phenomenon. For example, Caporael (1986) defines anthropomorphization as a "default schema" applied to non-social objects, a schema that is abandoned or modified in the face of contradictory evidence, thus defining anthropomorphism as a transient misclassification that will disappear as one gains additional knowledge about the object. This is an anthropological approach to anthropomorphism rooted in the initial contact between two very different groups

of people. Contrary to this view is Humphrey's (1992) theory, which claims that the transactional nature of interaction is so persistent that even in situations which are not transactional individuals still see things not as they are, but as they should be if they were players in a transaction. This theory is supported by findings of Nass et al. (1995), who found that subjects could be induced to behave and respond to computers as if the computers were human, even though users knew they were interacting with a machine.

It has been argued recently that the anthropomorphization of technical devices or of animals is a common phenomenon (Aggarwal & McGill, 2007; Gong, 2008). Even if a person is aware that she is addressing an inanimate object, the anthropomorphization persists; further, computer interfaces that feign a personality structure similar to the user's personality structure receive more attention and are generally interacted with for a longer time (Nass, Moon et al., 1995). In addition, the credibility of a computer as well as its influence on human decision making grows depending on the amount of anthropomorphism it shows (Burgoon et al., 2000). Several studies support the idea that humans' interactions with computers are fundamentally social in nature (Nass et al., 1994), even if the amount and fashion of computer use is moderated by other factors, such as computer attitudes and anxiety (Levine & Donitsa-Schmidt, 1998). These inherent tendencies within individuals should allow source designers to capitalize on the way individuals anthropomorphize objects in order to increase the relationalism of a source.

The above three perspectives provide insight into how individuals form relationships. A social relationship exists when interacting partners are interdependent (Kelley, 1983). Social exchange theory lays the groundwork for how individuals interact. Individuals respond to each other similarly when they share equivalent information, moving from more general information

to more specific information across time and taking turns when interacting (Blau, 1964; Cropanzano & Mitchell, 2005). The relationship develops as the two continue to interact and develop a shared history. Uncertainty reduction theory helps explain the goal of the interaction, which is to reduce uncertainty about other individuals and the environment. Individuals are inherently driven to reduce external uncertainty to acceptable levels (Berger, 1979; Berger & Calabrese, 1975; Clatterbuck, 1979). Research has shown that this drive to reduce uncertainty extends to nonhuman entities as well (Epley, Waytz, Akalis, & Cacioppo, 2008; Epley et al., 2007). Individuals readily anthropomorphize technology and continue to treat technology as if it were human while still acknowledging that the technology is in fact nonhuman (Moon, 2000, 2002; Nass, Lombard, Henriksen, & Steuer, 1995; Nass, Moon et al., 1995). Taken together social exchange theory provides an explanation of how individuals interact, uncertainty reduction explains the purpose for the interaction, and anthropomorphism shows that individuals do in fact relate socially to nonhuman objects.

2.3.4 Relational Communication Theory

Rafaeli (1986) asserts that information sources can be very intimate or anonymous, depending on the purposes of each individual user. Research has consistently shown that approximately 40% of the messages posted to a public online group centered on establishing relationships with others (Chesebro, 1985; Meyers, 1985). Foulger (1990) reported that experienced computer users rated several text-based media such as email and computer conferencing equivalent to face-to-face conversation. Several case studies of CMC conferences have found the development of numerous personal relationships via CMC (e.g. Johansen & DeGrasse, 1978). We (1993) argues that people become highly emotionally involved in their on-line interactions. Some people fall in love on-line, while some people exchange angry postings or

engage in flame wars. The clear outcome of this line of research is that information sources can support socioemotional communication (Rice & Love, 1987).

Walther and Burgoon's (1992) relational communication theory asserts that individuals adapt existing communicative cues, within the inherent constraints of the information source to enhance relational management. A major assumption of relational communication theory is that actors communicating via some source are affected by the same internal drive of "affiliation," i.e., interaction with other humans, as actors in other communicative contexts. Affiliative communication use, and its constituent messages, constitutes relational communication. A second assumption of the theory is that the development of an interpersonal impression of another person is based on the information one gets via nonverbal or verbal-textual channels over the course of several interactions. Based on these assumptions, is that mediated sources can be just as deeply relational as face to face communication if sufficient time and message exchange is allowed for message volume to generate a relationship. The presumption of a drive for affiliation helps explain why conference participants would express supporting references despite a lack of familiarity with co-participants.

By comparing face-to-face interactions with computer-mediated communication, Walther and Burgoon (1992) developed a theory of relational communication which identified several themes individuals employ when developing communal relationships with each other. Relationalism extends these themes to any information source, with two themes becoming particularly relevant: immediacy/affection and receptivity/trust. In empirical tests, it has been shown that individuals use these themes when communicating and forming relationships with each other (Burgoon & Hale, 1987).

The immediacy/affection aspect of communication refers to the fact that individuals form relationships with others who they like and avoid others who they do not like (Mehrabian, 1967). Further individuals form relationships with people who respond to them (Mehrabian, 1967; Walther, 1996; Walther & Burgoon, 1992). It is reasonable to extend this concept to information sources and argue that individuals will select sources they like and will avoid sources they do not like. Within a communal relationship the partners demonstrate concern for one another, which until recently, has been exclusively limited to interpersonal relationships. Recent advances in technology have allowed artifacts to begin to mimic communal relationships (Breazeal, 2003a, 2003b). Part of the perception of the relationship has with a source is that the individual feels as if she is interacting with something capable of maintaining a communal relationship. In other words, an information source needs to seem like another individual to enable the formation of a communal relationship whether it is or not.

The receptivity/trust aspect of communication refers to expressions of rapport, openness, and the desire to be trusted in a relationship (Walther & Burgoon, 1992). In interpersonal situations, trust is typically low during the initial stages of relationship formation, though if a communal relationship develops, it increases. When the interacting partners are distally located, trust formation lags in comparison to the nonmediated setting (Short et al., 1976). In order to form a communal relationship with any type of information source, the trust that develops between the interacting partners must also be present. In this case, the individual relies upon and makes themselves vulnerable to the accuracy and veracity of the information the source contains. Both immediacy and receptivity are key aspects in relationship formation and hence form the basis of relationalism. With the pertinent theoretical perspectives

developed, a formal definition for relationalism can be discussed that draws upon these theories.

2.4 Development of a Definition of Relationalism

Heretofore a source has either been considered relational or nonrelational (Rulke et al., 2000). A relational source meant the individual was interacting with another individual (either face to face or in a mediated setting) while a nonrelational source meant an individual was interacting with an artifact. This simplistic view of sources no longer adequately describes the way individuals use and interact with information sources.

With equivalent information available from numerous sources source designers need to consider the way individuals relate to information sources. Individuals readily anthropomorphize objects and form attachments to and relationships with inanimate objects (Aggarwal & McGill, 2007). Furthermore with companies attempting to leverage organizational knowledge consideration of how individuals relate to information sources can help these initiatives.

Information flows along relationship lines; whether consulting a trade journal or talking to a coworker, an individual has to have some sort of relationship with the source. A relationship can be broadly categorized as either communal or exchange (M. S. Clark & Mills, 1993)[4]. A communal relationship is typified as a relationship between friends or family members. In a communal interpersonal relationship, there is a general obligation for the parties to be

[4] Communal and exchange relationships are terms unique to Clark and Mill's (M. S. Clark & Mills, 1993) work. Blau (Blau, 1964) develops the concept of social versus economic exchange relationships. A social relationship entails *unspecified* return obligations while the economic exchange relationship is a quid pro quo arrangement. This relates to communal and exchange relationships in that a communal relationship is a social exchange type of relationship and the exchange relationship is an economic exchange relationship.

concerned about each other's welfare. An exchange relationship is more economic in nature. Relationship partners are not obligated to feel concern for one another but instead often treat each other politely as strangers (M. S. Clark & Mills, 1993). Information seeking is a utilitarian process; thus, when there is a relationship between a seeker and a source it is typically an exchange relationship. Nevertheless, some relationships with sources can be communal in nature. Relationalism is about sources conveying communal relationship aspects.

The purpose of an information source is to communicate its content to an individual who requires that content to accomplish a task. Communication occurs at the content and relational levels (Dillard, Solomon, & Palmer, 1999). In the past, only other individuals were able to send both content and relational messages. Sources today are capable of sending both content and relational messages; hence a source high in relationalism is one that an individual would perceive to convey both content and relational cues.

A relationship is a continuing association between two or more individuals (Ferrin, Bligh, & Kohles, 2008; Gabarro, 1990). Based on arguments presented elsewhere in this chapter, any source will have some degree of relationalism; hence, aspects that allow objects to be perceived as social actors should impact relationalism. Traditionally, sources have either been grouped as relational (interacting with another individual) or nonrelational (all other non-human sources). This research contends that this dichotomy (relational versus nonrelational) has always been incorrect, but now modern technologies have evolved to the point where sources no longer have to be treated as one or the other. Breaking down this dichotomy is important because individuals treat and interact with sources differently based on the experiences and the emergent relationship that develops between the individual and the source. (Lee, 2008; Vasalou, Joinson, BÃ¤nziger, Goldie, & Pitt, 2008). Social response theory and the concept of

social presence directly deal with technology as a social actor, thus, blurring the line between what it means to be relational and nonrelational (Nass & Moon, 2000; Nass, Moon et al., 1995; Nass et al., 1994). Social presence is the perception that an individual is interacting with another person (Nass & Moon, 2000). Characteristics of social presence can be broken down into feedback, multiple cues, and a shared history, and these will be discussed in more detail in subsequent sections, but there is more to relationalism than social presence. Communal and exchange relationships also are expected to impact perceptions of relationalism.

In a communal relationship individuals show care and concern for one another. To get to that point, individuals need to identify with one another (Brewer, 1979). There needs to be some common element between both interacting partners, which forms the basis of the communal relationship. Unlike purely social interpersonal relationships, relationships under investigation in this research have a sense of utility inherent in them in that the seeker needs information from some source.

Since information seeking behaviors are being investigated, it can be assumed that an individual is searching in response to some need (see Figure 2). The task context is representative of the purposefulness of an information search, which is representative of the utilitarian-exchange nature of relationships. In addition to a utilitarian exchange individuals often add extraneous information meant to enhance the social relationship between the two interacting partners (V. D. Miller & Jablin, 1991). Information sources can be designed to incorporate these social elements to varying degrees. As sources have more (or less) amounts of these utilitarian and social qualities, individuals' perceptions of a particular source's relationalism should be impacted. This is why this work argues that all sources have some

degree of relationalism and that relational and nonrelational sources can no longer be viewed as coming from distinct categories but should be viewed as endpoints of a continuum.

Relationalism was defined in the previous chapter as *the perception that an individual can form a relationship with a source.* From the discussion above, for a source to be considered highly relational it needs to facilitate the perception of a communal relationship. A communal relationship it is argued is comprised of two major aspects—the affiliative and the receptivity. According to the theory of relational communication both are required to forge a communal relationship. It is not enough that an individual like an information source, but there also has to be elements of trust as well in order for a relationship to form. Likewise it is not enough to merely trust the content of the information source, but instead the individual has to like the source in order for the relationship to adequately form. The next section develops the pertinent aspects available to source designers that will allow for sources to be perceived as more (or less) relational.

2.5 Relationalism Antecedents

In this section, four different aspects of technology, relationships, and information are developed based on the theoretical perspectives presented in the previous section. As will be argued in the next chapter, these aspects are expected to impact an individual's perception about the relationalism of a source. Some of these antecedents can be considered design elements whereby source designers can use these characteristics inherent within a source to effect perceptions of relationalism. Further since the goal of an information source is to communicate information, these antecedents should enhance the communicative aspects of a source.

2.5.1 Feedback

One portion of relational communication includes feedback. When two individuals interact successfully their conversation is characterized by two-way communication where each partner responds to the other. This type of feedback is one aspect of social presence, which refers to the degree to which an information source is perceived as conveying the presence of the communication partner (Nass & Moon, 2000). In order for one individual to perceive the presence of another, the communicating partner has to provide feedback. In turn, sources that incorporate feedback will have higher levels of relationalism.

Within SET and URT, feedback is an important element. Social exchanges are dependent upon the feedback each interacting partner receives. Further, reducing uncertainty also depends upon feedback among the interacting partners. Information sources that enable feedback should be better at reducing uncertainty as well, which in turn should also impact the social presence of the communication partner. While feedback and responding to cues is part of social presence, the relational portion of communication is made up of more than just feedback. It is important that feedback occur between the interacting partners or else one member of the dyad will feel ignored, but feedback alone cannot create perceptions of in interpersonal interaction. The next section reviews another aspect of social presence that complements the feedback aspect of relational communication.

2.5.2 Shared History

As individuals interact with each other over time, not only is the uncertainty between partners reduced, but a shared history also develops between them. This history consists of the experiences the pair has dealt with over an extended period of time (Hollingshead, 1998). For example, one individual can go to the other and ask how a certain problem was previously

solved. Another example of a shared history is when a sender customizes a message to best suit the preferences of the receiver. In Figure 4, both the actual communication and the meta-content can be optimized so as to suit the preferences of the receiver. From the perspective of the receiver, this is done automatically without conscious effort on their behalf. Shared history is another important part of social presence. Once a pair has interacted with each other, the shared history has to be acknowledged or else the individuals will feel as if they are interacting with a different person.

A shared history between interacting partners is an important piece of the communication process. Relationships develop over time, and unless the shared aspects that occurred in the past are captured, the individuals' perceptions of an interpersonal relationship are likely to be nonexistent (Breazeal, 2003b). SET argues that as individuals continue to interact over time, the information shared between them becomes more personal and intimate. Further, as individuals continue to interact, specialized memory systems develop whereby each partner becomes the designated holder of certain pieces of information (Hollingshead, 1998; Wegner, Erber, & Raymond, 1991). All of this is dependent on the passage of time and the history that develops when individuals continually interact with one another which helps develop the perception of relationalism. The next section reviews the final piece of social presence that complements feedback and shared history.

2.5.3 Multiple Cues

Multiple cues are the informationally redundant pieces of communication and are very important aspects of interpersonal relationships. For example, if one person has to give another individual bad news, the message content might be accompanied by a lowered voice and a comforting touch. These actions make for a richer source and serve as additional cues that send

the message “this is bad news” in addition to the verbal message content. The nonverbal behaviors and tones used to convey the message are redundant cues that reinforce the actual message. These nonverbal behaviors can serve to reduce the uncertainty of the message. Multiple cues are another important piece to social presence. To make one feel as if another is actually there these informationally redundant cues need to be present.

Multiple cues between interacting partners are also a requisite condition to create the relational portion of communication. These additional cues reaffirm the message content of the communication. Many of these informationally redundant cues used to be possible only through face-to-face communication, but individuals have managed to incorporate them into conversations even when the interacting partners are distally located the most famous example of this concept being the emoticon (J. R. Carlson & Zmud, 1999; Nardi, 2005).

Another benefit of these informationally redundant pieces of information is their ability to reduce uncertainty about the information exchange further. URT argues that communication exists to reduce uncertainty; hence, when multiple methods of reiterating the same message are available, uncertainty should be reduced quickly and effectively.

2.5.4 Identification

Social identity also plays an important role in developing relationalism. This is because individuals tend to identify and seek out individuals who are similar to them when forming relationships. The common saying “opposites attract” is not born out in practice; rather, individuals surround themselves with the comfort of like-minded others (J. McCroskey, Richmond, & Daly, 1975; L. L. McCroskey, McCroskey, & Richmond, 2006).

A social identity is a categorization of the self into more inclusive social units (Brewer, 1991). As a member of a social unit, individuals are motivated to maintain a favorable image of

that unit (Tajfel & Turner, 1986). As predicted by social identity theory, people evaluate the groups to which they belong more favorably than groups to which they do not belong, whether the basis of group categorization is meaningful or arbitrary (Brewer, 1979; Hewstone, Rubin, & Willis, 2002). One of the easiest ways groups form their identities is based on physical appearance. Group formation based on appearance is especially easy to accomplish when all parties are located in the same place.

This tendency even carries over into mediated environments. When communicating online via avatars, individuals prefer to interact with a humanoid avatar over an animal avatar and prefer realistic humanoid avatars over cartoon humanoid avatars (Gong, 2008; Gong & Nass, 2007; Nowak & Rauh, 2006, 2008). It is easier to identify with another who is perceived to be similar to oneself; hence, a relationship is more likely to develop between the similar others.

Identification is also an important aspect of relational communication. When communicating partners are members of the same group, they have more favorable images of each other. For example, think of two conservatives discussing politics as opposed to one liberal and one conservative. In the first instance, the interacting partners are more likely to have favorable opinions of each other than the pair in the second instance. When an individual identifies with a source, it is likely that she will feel that the source is higher in relationalism, since it will be easier to form a relationship with that source due to the common ground.

In this section, the mechanisms that impact communication were developed. Each of the preceding four aspects will be operationalized in Chapter 3 and will form the antecedents to relationalism. Since relationalism is the perception that an individual can form a relationship with a source, understanding the communication patterns that enable a relationship to be

formed is imperative for this work. These communication mechanisms capture the most salient aspects that enable relationship formation.

2.6 Summary

This chapter reviewed the source selection literature as well as the research streams that inform relationalism. The key takeaways are presented in Table 4. Previous information-search literature has centered on the stages individuals pass through as they search for information. Task-stage research has lead to a fractured view of searching with a different model of searching used for different groups of searchers (Ellis et al., 1993; Meho & Tibbo, 2003). This specificity ignores the commonalities in the search process through which all searchers pass.

Taking a more holistic view of information search, O'Reilly's (1982) framework that argues source selection is based on task, seeker, and source characteristics. Task characteristics, such as task complexity has been studied in conjunction with the strategies an individual uses to extract information (D. J. Campbell, 1984; D. J. Campbell & Ilgen, 1976; Jacoby et al., 1994) but not in terms of how the task impacts the source he/she chooses in the first place. Seeker characteristics have also fallen into two broad categories. Demographics have helped fracture research into different models for different groups. This study argues that there is a commonality to the search behaviors of information workers, which different models for each profession have overlooked in the past. Instead of focusing on demographics, the personality and cultural aspects of individuals are explored in this research. With relationalism, it is expected that personality traits will affect the way an individual interacts with others and that these traits would have been particularly relevant to these previous investigations. Going forward, the ideas from this chapter are used to develop a testable research model.

Section	Takeaway
2.1	All information-seeking models conform to a basic three-step process (Choo, 2006): • Information need—the context that drives the seeking process. • Information search—the behaviors exhibited when searching for information. • Information use—extracting and using the found information to address the originating need.
2.1	Individuals make three major decisions during the information search phase of the information-seeking process (Sacchi & Burigo, 2008): • Where to search—rely on one's own knowledge versus relying on the knowledge of another. • What source to access—choosing which source to access from the array of sources available. • When to stop—deciding enough information has been found and moving on to the "use" phase.
2.2	There are three main determinants of source selection (O'Reilly, 1982): • Task characteristics—the underlying task context. • Seeker characteristics—individual characteristics that vary from person to person. • Source characteristics—aspects of the source itself.
2.2	Interpersonal communication is comprised of up to five different elements (Burgoon & Hale, 1984): • The actual content—the main message. This is either the text printed on the page or what an individual is actually saying. • The meta-content—the unspoken aspects of the message, such as voice tone, body language, or other nonverbal cues. • The sender—the source that is conveying information. • The receiver—the individual who is engaged in the information-seeking process. • The medium—the method that allows individuals to communicate across distances, it is also involved when the source is nonhuman.
2.3	Relationalism is a new task characteristic defined as the perception that an individual can form a relationship with an information source.
2.4	Evolutionary theory argues that individuals are evolutionarily driven to relate socially to the external world (Gallup, 1982).
2.4	Social response theory argues that individuals will respond to nonhuman objects socially provided the object extends a social cue (Nass & Moon, 2000).

Section	Takeaway
2.4	Uncertainty reduction theory argues that individuals communicate to reduce uncertainty. When uncertainty is acceptably reduced, the likelihood of future interactions is increased (Berger & Calabrese, 1975).
2.4	Anthropomorphic theory argues that individuals readily ascribe human tendencies to animals and technology (Aggarwal & McGill, 2007).
2.5	There are five characteristics that influence perceptions of interpersonal communication (Brewer, 1991; J. R. Carlson & Zmud, 1999; Nass & Moon, 2000): • Feedback—the interaction is comprised of two partners sharing information via turn taking. • Shared history—relationships unfold over time, and partners keep an informal history so the relationship can grow and develop. • Multiple cues—the receiver gets informationally redundant cues from the sender. These redundant pieces of information reinforce the actual message. • Identification—interacting partners identify with each other and feel as if they belong to the same group. • Contextualization—interpersonal communication occurs within a context, which in the seeking process is the originating need that drives the receiver to search for information.
2.5	These five characteristics are expected to impact perceptions of relationalism.
2.5	These five characteristics can be extended to when an individual is interacting with any source whether it is another individual or an object (Nass & Moon, 2000).

Table 4. Chapter 2 takeaways.

Chapter 3: Research Model and Hypothesis Development

In the previous chapters, motivation for this work was developed and pertinent theoretical frames were reviewed to explain the information-seeking process, the drivers of source selection, and characteristics that make interpersonal communication unique. In this chapter, a testable research model is developed with the goal of answering the research questions originally posed in Chapter 1. The balance of this chapter will present the research model; define, detail, and operationalize the constructs in the model; and present the hypotheses. This chapter concludes with a summary of the key takeaways to inform the research methods discussed in Chapter 4.

3.1 Proposed Research Model

Following O'Reilly (1982), any thorough model of source selection will address task, source, and seeker characteristics. The proposed research model is shown in Figure 7. The rest of this chapter will be devoted to developing the research hypotheses.

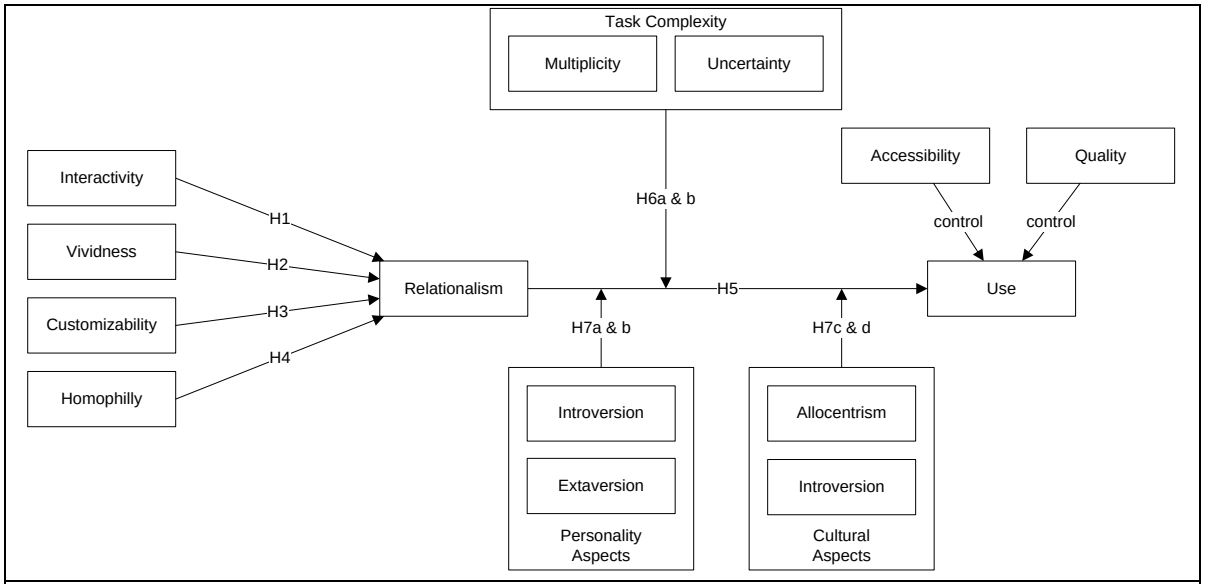


Figure 7: Proposed research model.

As can be seen in Figure 7, relationalism plays a central role in the research model. The research questions primarily involve relationalism, and as a new construct, this is an appropriate place for relationalism in the research model. Upon the conclusion of this research, the antecedent to relationalism will be identified as well as relationalism's relationship with source selection.

Prior source-selection research has established a clear relationship between source characteristics and selection (Allen, 1984; Culnan, 1983; O'Reilly, 1982). In the research model shown in Figure 7, three potential source characteristics are identified. Relationalism, a new source characteristic, is the primary focus of this work. The other two source characteristics, quality and accessibility, have a long history in source selection research and are included in the model as control variables. In the model task characteristics are operationalized as task complexity, while seeker characteristics are operationalized as introversion and allocentrism. It is expected that individuals will select sources higher in relationalism but, as will be covered in subsequent sections, complexity, introversion, and allocentrism are expected to moderate the selection decision. All study constructs are listed by grouping in Table 5.

Source	Task	Seeker
Relationalism	Multiplicity	Introversion
Quality (control)	Uncertainty	Allocentrism
Accessibility (control)		

Table 5. Study constructs grouped by characteristic.

3.2 Source Selection & Use

Source use is the final dependent variable in the research model and is intertwined with use in that when a source is selected, the individual intends to use the information contained within the source. Information search (the middle box in Figure 2) is a process that unfolds

across time; therefore, selection can occur at several different points in the process. Selection can occur at one of four different search events—either with initial selection, first pass, deep pass, or problem solving. These different views of source selection are defined in Table 6 (Dahlin, Weingart, & Hinds, 2005; Wang & White, 1999).

Defining source selection involves making a tradeoff between capturing any source an individual contacts versus capturing the source the individual relies upon to address their information need, with later stages limiting the number of sources initially selected. This tradeoff is shown in Table 6. Since subjects in the experiment (see Chapter 4) will be selecting the source they wish to use to accomplish a task, selection should be defined at the problem solving point (see Table 6). For similar reasoning respondents in the survey will be considering sources they have used to accomplish a particular work task so again selection should be defined at the problem solving stage.

Source selection is defined this way because individuals interact with the content contained within the source. By defining selection at the problem solving point, the most realistic point for selection is used. Defining selection at a different point would necessarily mean that the individual has not interacted with the information contained within the source and cannot have made critical determinations how the source might meet their needs with regards to the relationalism antecedents.

The focus of the research is on the relationalism construct and how that impacts selection. The attractiveness of the source and the information the source contains is important to making that determination. Source designers can control how the source is developed, and they can control how the information that the source contains is presented. Therefore, this

research defines selection once information has been processed and the individual is beginning to address their instigating need.

Use point	Definition	Pros and Cons
Initial selection	Selection occurs the moment an individual goes to the source	**Pro:** Includes all sources **Con:** Includes sources that do not contribute to the final solution
First pass	Selection occurs the moment an individual makes a usefulness determination	**Pro:** Excludes irrelevant sources **Con:** Includes sources that do not contribute to the final solution
Deep pass	Selection occurs the moment an individual includes the source in a possible solution set	**Pro:** Information has been processed; relevance determination made **Con:** Focus is on the information and not the source
Problem solving	Selection occurs when the individual uses the information in the source to address the originating need	**Pro:** Accuracy **Con:** Includes the use portion of the search process; focus on information instead of source

Table 6. Use points in the information-search process.

3.3 Hypotheses

In this section, the study hypotheses will be developed. The hypotheses that form the antecedents to relationalism will be developed first. Then the source characteristic hypotheses will be developed, which will be followed by the task characteristic hypotheses and the seeker characteristic hypotheses.

3.3.1 Antecedents to Relationalism

In the previous chapter, the antecedents to relationalism were discussed. These antecedents consist of feedback, shared history, multiple cues, and identification. Further, the argument that every source has some degree of relationalism was proposed. Many of the proposed hypotheses are designed to test the idea that sources can be intentionally designed to have more (or less) relationalism. Several potential antecedents of relationalism are identified. These antecedents are interactivity, vividness, customization, and homophily. All these antecedents are defined and developed in subsequent sections in this chapter. Three of the antecedents are design elements (interactivity, vividness and customization), which allow source designers to manipulate how the content is presented. Another antecedent, homophily, is the tendency that individuals bond with similar others, and it has been identified as a social antecedent, which research shows is a precondition for individuals to like one another (Goei, Massi Lindsey, Boster, Skalski, & Bowman, 2003; Mantovani, 2001). The next sections will define each antecedent construct and hypothesize its relationship with relationalism. Since an information source is expected to communicate information, these antecedents can also be considered the mechanism through which a source communicates its information.

3.3.1.1 Interactivity

Interactivity has been investigated in several different domains[5]. While this is a testament to the popularity of interactivity as a concept, it comes at a price, that being numerous definitions and conceptualizations of interactivity. Interactivity has been discussed in the fields of marketing, communication, information systems, and psychology (G. J. Johnson,

[5] A complete review is beyond the scope of this work, but a thorough review of the construct can be found in the works of McMillan and her colleagues (Downes & McMillan, 2000; McMillan, 2002; McMillan & Hwang, 2002).

Bruner, & Kumar, 2006). For this research, interactivity is defined as the degree to which an information source can create (or facilitate) a mediated environment that allows the individual to participate in reciprocal message exchanges (Kiousis, 2002). This definition for interactivity was adopted because communication is essential to relationship formation (Bonebrake, 2002; Hardey, 2008; Lobel, Neubauer, & Swedburg, 2005).

When individuals interact, one person responds to the other. When an individual is searching for information, interactivity is the source's responsiveness to the individual's input. While interactivity has a long history with computerized information sources, it applies to any information source (human or not). The core of interactivity is that the information source responds *as if* the individual was interacting with another human (Gerring & Prentice, 1996). Interaction with another individual is not synonymous with relationship formation, but instead is a precursor for a relationship. Hence it is expected that interactivity should facilitate the perception of relationalism, in that a greater degree of interactivity increases the likelihood a relationship will be formed.

Part of interpersonal communication is feedback. Within an interpersonal relationship, the participants act and react to one another. In other words, there is feedback between the interacting dyad as one partner processes the messages sent from the other and then responds to those messages. Social exchange theory argues that individuals respond to each other in kind (Blau, 1964). Hence when one individual shares a piece of information, the other feels an obligation to share something similar in return. Further, anthropomorphism theory argues that individuals readily ascribe human tendencies to inanimate objects (Epley et al., 2007). This tendency is born out in the HCI literature where individuals report interacting with a computer is just like interacting with another individual depending on how those interactions were

coordinated (Moon & Nass, 1996; Nass, Lombard et al., 1995; Nass & Moon, 2000). When a source provides feedback by being interactive, it should result in a source that seems more personable or relational, which suggests the following hypothesis:

Hypothesis 1: Interactivity will have a positive relationship with relationalism.

3.3.1.2 Vividness

Vividness has typically been investigated in one of two ways. In the communication and information systems literature, vividness is reduced to bandwidth (Fortin & Dholakia, 2005; Jiang & Benbasat, 2007b). Vividness from the bandwidth perspective is merely the amount of information that can be conveyed per unit time. The second way vividness has been investigated is from an emotional standpoint (Frey & Eagly, 1993; Sundar & Kalyanaraman, 2004). From this perspective, vividness equates to something that is emotionally interesting; hence, if the information provokes an emotional response, then it is vivid information (Nesbett & Ross, 1980).

For this study, the former view of vividness is adopted; thus, vividness is defined as the representational richness of the source based on its formal features, that is the way the source presents information to all of an individual's senses (Steuer, 1992). The bandwidth view is adopted over the emotional view due to its emphasis on the source rather than the information. When an individual has an emotional response, it is due to the content of the source, not the source itself.

As discussed in the previous chapter, individuals communicate through the actual content and the relational content of a message (see Figure 4). Uncertainty reduction theory argues that communication exists to reduce the uncertainty between individuals. Smiles, nods, and happy tones which are all manifestations of vividness are all part of the relational content of

the message, which further reduces the uncertainty between the individuals communicating. Rich interpersonal communication includes multiple cues, which are the totality of the message, not just the content. Sources that provide multiple cues can provide information to all of an individual's senses.

Vivid information is also more appealing and more likely to be stored and remembered than nonvivid information. Highly vivid interfaces provide multiple stimuli, clarify meanings, and enrich communication. They create a richer landscape in which relationships can develop because of their ability to generate a virtual environment for the individual in which experiences will mimic the physical environment as closely as possible (Burke, 1996).

Vividness is another design element that source creators need to consider. Vivid cues enhance perceptions of social presence because they help the individual feel as if another person is present, and feeling as if another person is present generally enables relationship formation. The more vivid cues an information source can provide, the more that source should be perceived as something an individual could develop a relationship with. This suggests the following hypothesis:

Hypothesis 2: Vividness will have a positive relationship with relationalism.

3.3.1.3 Customizability

Customizability has its roots in targeted marketing; however, whereas targeted marketing focuses on a market segment, customizability extends this idea to the individual level (Kalyanaraman & Sundar, 2006). Customization can occur at one of two levels. First, message-level customization refers to tailoring a message to suit one individual. Second, source-level customization refers to tailoring the presentation of the message to suit the individual (Wind & Rangaswany, 2001). Since this study's focus is on the selection of sources, its focus is on source-

level customizability. With regard to message content, as the content becomes more customized, individuals report that the message seems to be more like interpersonal communication (Beniger, 1987). This finding will extend to source-level customization and is a result of the shared history between the individual and the source. As individuals communicate across time, they develop a shared history. It takes interactions with a source across time for an individual to truly customize a source, but once accomplished, the individual and the source will have a shared history together, making it more likely that the individual will act as if the source is an old acquaintance. Once a source is customized over time, it is likely the individual will identify with the source as a reflection of herself.

Customization is aimed at the individual and allows the user to be in charge of the presentation of the information she is seeking. The individual adapts the source to suit her own needs which is taken to be a reflection of her own interests, preferences, needs, and knowledge (Alpert, Karat, Karat, Vergo, & Brodie, 2003). By modifying the presentation of the source, the individual is able to further reduce the uncertainty in the communication, as it is more ideally suited to her preferences. Customization is defined as the ability for an individual to modify a how a source presents its information to meet her needs (Kalyanaraman & Sundar, 2006; Kobsa, Koenemann, & Pokl, 2001).

When an individual customizes a source, she is manipulating the source to reflect some aspect of herself (Petty, Barden, & Wheeler, 2002). Customization is a reflection of the individual's identity, and the net effect is that the individual will feel as if the source is catering to her identity which, in turn, would be expected to impact that individual's perception about her ability to form a relationship with the customized source. This suggests the following hypothesis:

Hypothesis 3: Customizability will have a positive relationship with relationalism.

3.3.1.4 Homophily

Individuals tend to form relationships with others who they perceive to be similar to themselves, a phenomenon defined as homophily (Lazersfeld & Merton, 1954; McPherson, Smith-Lovin, & Cook, 2001; Reagans, 2005). This finding also extends to situations in which the interacting partners are not collocated and even to parasocial relationships in which individuals identify with television characters (Eyal & Rubin, 2003; Yuan & Gay, 2006). When individuals identify with a source, the individual incorporates the message content of the source into their own self concept and are more likely to act on that message content (Cohen, 2001). This process is enhanced when the source is perceived to be similar to the individual (Eyal & Rubin, 2003). Whether the aggregating trait is race, political beliefs, or socio-economic status, as a general rule, birds of a feather flock together.

The theory of homophily, defined by Lazarsfeld and Merton (1954), is that most human communication will occur between a source and a receiver who are alike. Homophily is the degree to which individuals in a dyad are congruent or similar in certain attributes, such as demographic variables, beliefs, and values (Touchey, 1974). Rogers and Bhowmik (1970) posit that homophily occurs frequently because communication is more effective when the source and the receiver are similar. When two individuals share common meanings, beliefs, and mutual understandings, communication between them is more likely to be effective. Individuals enjoy the comfort of interacting with others who are similar, as talking with those who are markedly different from us requires more effort to make communication effective. The above information on homophily suggests the following hypothesis:

Hypothesis 4: Homophily will have a positive relationship with relationalism.

3.3.1.5 Summary of the Antecedent Hypotheses

Hypotheses 1-4 develop the reasoning for the antecedent factors for relationalism. These antecedents are rooted in several theoretical perspectives detailed in the previous chapter. In Chapter 2, several broad antecedent factors that are inherent in interpersonal relationship formation were identified and reviewed. These factors included feedback, shared history, multiple cues, identification. In the preceding sections, these broad ideas were operationalized into interactivity, vividness, customizability, and homophily respectively.

3.3.2 Source Characteristic Hypothesis

The model shown in Figure 7 contains three source characteristics: relationalism, accessibility, and quality. Relationalism is defined as *an individual's perception that she can form a relationship with a source*, which a quality that every source has to some degree. Information quality and source accessibility are also considered and are included as control variables because they have been so well researched in the past. Further, quality and accessibility are akin to the costs and benefits of the information-seeking process (P. J. Carlson & Davis, 1998; Culnan, 1983; O'Reilly, 1982; Zimmer et al., 2008). The proposed model is focused on the effect of relationalism, so it stands to reason that the effects of quality and accessibility need to be controlled.

The relationalism of a source is unique to that particular source. This is to say that each instance of a particular source can have differing amounts of relationalism. For example, assume an individual needs a book about how to program in C++ and she finds two different books on the subject. One is entitled "Programming in C++" and the other is part of the dummies series and is entitled "C++ Programming for Dummies." Each source is of a single type, but the amount of relationalism in each source is likely to be different.

Chapter 2	Chapter 3	Justification for mapping
Feedback—typified by two-way communication	Interactivity—the degree to which an information source can create (or facilitate) a mediated environment that allows the individual to participate in reciprocal message exchanges.	When individuals interact, one responds to the other. When an individual is searching for information, interactivity is the source's responsiveness to the individual's input. While interactivity has a long history with computerized information sources, it applies to any information source. The core of interactivity is that the information source responds *as if* the individual is interacting with another human (Gerring & Prentice, 1996).
Multiple cues—Informationally redundant pieces of communication and are very important aspects of interpersonal relationships	Vividness—the representational richness of the source based on its formal features, that is the way the source presents information to all of an individual's senses	Smiles, nods, and happy tones are all part of the relational content of the message, which further reduces the uncertainty between communicating individuals. Rich interpersonal communication includes multiple cues, which are the totality of the message, not just the content. Sources that can provide multiple cues can provide information to all of the individual's senses.
Shared history—the set of common experiences that bind continually interacting partners together	Customizability—tailoring the presentation of the source's message to suit the needs of the individual	As individuals communicate across time, they develop a shared history. It takes interactions with a source across time to truly customize it, but once accomplished, the individual and the source will have a shared history together, and the individual can be expected to act like the source is an old acquaintance. Once a source is customized over time, it is likely that the individual will identify with the source as a reflection of him/herself.
Identification—the tendency for the self to organize into more socially inclusive units	Homophily—the tendency for individuals to form relationships with those they perceive as similar to oneself.	When individuals identify with a source, the individual incorporates the message content of the source into their own self concept and are more likely to act on that message content (Cohen, 2001). This process is enhanced when the source is perceived to be similar to the individual (Eyal & Rubin, 2003). Individuals tend to associate and bond with others who are similar to them, a phenomenon defined as homophily (Lazerfeld & Merton, 1954).

Table 7. Mapping of Chapter 2 antecedents to Chapter 3 antecedents.

Individuals will select sources high in relationalism. From birth, humans socially orient themselves to the world. This social orientation to the world is so strong that individuals will socially interact with inanimate objects, such as robots and computers (Breazeal, 2003a, 2003b; Nass & Moon, 2000; Nass, Moon et al., 1995). System designers are beginning to capitalize on the human tendency to interact socially with inanimate objects. In technological interactions, the more anthropomorphic aspects a piece of technology has, the more socially individuals respond to it, thereby increasing the effectiveness of the human-computer interaction (Gong, 2008). For example, when implementing voice technology into a source, individuals overwhelmingly prefer a human voice to a computerized one (Gong & Nass, 2007).

What makes an information source unique over another piece of technology is that an individual goes to an information source to address some sort of need. The end result is not merely obtaining the information; instead, it is to enable the individual to accomplish a larger task. In essence, the individual is partnering with the information to address the need; therefore, sources that are more "partnerable" can be expected to be selected more often than sources that are less "partnerable".

Sources that have more relationalism transfer their content on both the actual content and meta-content levels (see Figure 4). These sources incorporate feedback, multiple cues, shared history, identification, and context. Individuals are evolutionarily predisposed to receive messages from sources that contain these five aspects. From this, it can be expected that individuals will select sources with higher levels of relationalism. This suggests the following hypothesis:

Hypothesis 5: There will be a positive relationship between relationalism and source selection.

3.3.3 Task Characteristics Hypotheses

As discussed in Chapter 2, task characteristics, specifically task complexity, are expected to play a role in determining source selection. The research model contains two aspects of task complexity derived from Campbell's (1988) conceptualization. The first is complexity based upon the number of "things" an individual must attend to when completing a task; this type of complexity is called multiplicity. The second type of complexity is uncertainty, which is based on an individual's inability to wholly determine the optimal way to implement a solution. The definitions of each type of complexity and how Campbell's (1988) conceptualizations maps to this study are shown in Table 8.

When facing a cognitively challenging assessment task, individuals arrive at their conclusions by considering a broad range of facts and then by conducting a detailed examination of a subset of facts (Etzioni, 1989). In doing so, they encounter the limits of their bounded rationality. Bounded rationality refers to the limits experienced by individuals when they process and interpret a large volume of pertinent information in their decision-making activities (Simon, 1979). Bounded rationality encompasses two central concepts: search and satisficing. Search refers to how extensively a decision maker searches for information to guide his/her decision making. The search scope is capped by what is described as an aspiration level that defines what constitutes an acceptable solution at the outset of the search process. As soon as this aspiration level is reached, individuals terminate the search process and reach a tentative conclusion (Simon, 1979).

Complexity due to multiplicity is likened to workload, and it varies as a function of task demands placed on the human operator and the capacity of the operator to meet those task demands (Gopher & Donchin, 1986). Whether the additional workload comes from multiple

competing paths that lead to a solution for which the individual needs to choose an optimal path or if it comes from multiple distracters impeding the individual's ability to find the correct solution, information is needed to reduce the noise the multiple paths and multiple outcomes represent.

Campbell's (1988) Complexity Dimensions		**Complexity Dimensions for this Study**	
Multiple Paths	Numerous paths to a single solution exist for a problem.	Multiplicity	Complexity increases due to the number of details an individual must attend to.
Multiple Outcomes	Numerous outcome criteria exist, and each has to be addressed in the solutions.		
Probabilistic Linkages	Competing or conflicting criteria for the outcomes exist, such as maximizing both quality and quantity.	Uncertainty	Complexity increases due to the inherent uncertainty or conflict in the task.
Conflicting Interdependencies	Connections between path activities cannot be drawn to the desired outcomes with certainty.		

Table 8. Dimensions of complexity identified by Campbell (1988) and how they map to this study's complexity conceptualization.

This noise can be reduced when individuals work together since their cognitive processing power is increased, the result of which is improved decision making (Hill, 1982; Miner, 1984). This improved decision making is due to sharing and dividing subtasks, which makes it possible for each individual to draw on the other's cognitive resources, thereby enabling the pair to tackle tasks too complex for one individual alone (Cannon-Bowers et al., 1993; Cooke, Kiekel, & Helm, 2001). This not only lowers the individual's cost of using a source

by sharing the cognitive load, it also increases the benefits and helps generate a solution more quickly given that the seeker trusts that other individual will provide high quality, credible information (Blinder & Morgan, 2005).

For complex tasks caused by multiplicity, by definition, the individual is required to process more information about the situation in order to arrive at an appropriate course of action. Modern technologies can help process information or parse out noise like another individual does. For example, if an individual is researching automobile features, websites can limit search results based on the features the individual cares about, or automated bots and agents can filter information and make suggestions according to the user's encoded personal preferences (Eliassi-Rad & Shavlik, 2003; Mukherjee, Sajja, & Sen, 2003). As long as the individual trusts that the source will provide high quality information, the source takes on a portion of the information processing and, in effect, simplifies the task for the individual. When a source has high levels of relationalism and when the task is complex due to multiplicity, the relationship between relationalism and selection will be strengthened as compared to situations where the task is less complex. This leads to the following hypothesis:

Hypothesis 6a: Multiplicity will moderate the relationship between relationalism and source selection. Specifically, the relationship between relationalism and source selection will be stronger when multiplicity is high.

The second type of task complexity under investigation is uncertainty[6]. Uncertain tasks require an individual to exercise judgment when completing a task. By definition, an uncertain

[6] Uncertainty is a term specific to Campbell's (1988) work. It does not refer to a lack of information but instead is more akin to equivocality. Equivocality exists when multiple interpretations of the same information exist (Daft et al., 1987).

task is a task that even with the best information, its outcome cannot be fully determined, so, the goal is to reduce the uncertainty to the point at which the task can be completed.

While rational decision making is the goal, the context also referred to as the environment or problem space is too vast and too complex for every decision to be completely rational (Simon, 1979). An individual makes the most rational decision possible given the current situation. The role of the information source in dealing with an uncertain task is to help the individual reduce the uncertainty to some degree. The individual is forced to rely on the information contained within the source. Since the uncertainty cannot be completely eliminated, the information that is intended to reduce the uncertainty travels best along relationship lines due to trust considerations inherent in relying on another's judgment (Sniezek & Van Swol, 2001; van 't Wout & Sanfey, 2008). Individuals trust others more quickly when they work face to face (a high relationalism type of source) versus when they work with others over video (lower relationalism) or text (lowest relationalism), which is indicative that individuals will prefer sources with greater amounts of relationalism when dealing with uncertain tasks (Bos, Gergle, Olson, & Olson, 2001). This is true even if the source is not another person but an electronic agent programmed to act like another individual (Hertzum, Andersen, Andersen, & Hansen, 2002).

Individuals often consult experts in an attempt to reduce uncertainty (Van Swol & Sniezek, 2005). When consulting an expert, an individual places their trust in him/her and draws upon the expert's experience and insight in the problem domain. Experts can reduce uncertainty better than those unfamiliar with the situation (Sacchi & Burigo, 2008). Prior works have demonstrated that when faced with uncertain tasks, individuals use other individuals that they perceive as experts as information sources (Byström & Järvelin, 1995; Tiamiyu, 1992). Another

individual is typically a source that can be considered to have a high amount of relationalism. As such, rather than saying an individual goes to another for uncertain tasks, it is argued here that an individual simply wants sources that are high in relationalism.

When tasks cannot be determined with certainty, an individual will have to make a satisficing decision and will prefer sources that help in that regard. Other individuals associated with the seeker have the ability to weigh costs and benefits and can draw from prior similar experiences, thereby helping the seeker make a better decision. The net effect of such interactions is that the individual places his/her trust in another and, in return, receives the increased processing power since the expert is doing some, if not all, of the processing. Uncertain tasks have higher information-processing requirements and will, therefore, strengthen the relationship between relationalism and selection, thus leading to the following hypothesis:

Hypothesis 6b: Uncertainty will moderate the relationship between relationalism and source selection. Specifically, the relationship between relationalism and source selection will be stronger when uncertainty is high.

3.3.4 Seeker Characteristics Hypotheses

Prior work in source selection has typically operationalized seeker characteristics along demographic lines. Information use is seen as a function of an individual's profession (Ellis et al., 1993; Gerstenberger & Allen, 1968; Meho & Tibbo, 2003) and is a contributing factor to her source selection. Since this study focuses on the social aspects of source selection, it is appropriate to examine seeker characteristics that relate to the seeker's preference for interpersonal interaction.

Introversion is a personality trait that influences how individuals socially orient themselves toward others in their environment (Eysenck & Eysenck, 1985; McCrae & Costa,

1985). When it comes to making friends in an online environment, one line of reasoning follows the "rich get richer" phenomenon, which states that individuals who have better social skills and many friends will use their advanced social skills to make more friends on the internet; whereas, individuals who are less socially adept and have poorer social lives offline are likely to gain less from their internet interactions (Amichai-Hamburger, Kaplan, & Dorpatcheon, 2008; Kraut et al., 1998). In terms of information-source selection, this idea suggests that extraverts will select sources that convey relationship qualities, while introverts will avoid sources that convey relationship qualities.

Relationalism deals with how social a source is perceived to be; hence, it is expected that this personality trait would impact relational source selection. Introverts try to establish autonomy and independence from other people (Hills & Argyle, 2001) and find social interactions to be less pleasant and more stressful (Lucas & Diener, 2001; Lucas, Le, & Dyrenforth, 2008). This is likely due to the levels of cortical arousal experienced by each type of individual when placed in social settings (Kumari et al., 2004; Stenberg et al., 1990). Therefore, introverts would be expected to avoid information sources that are designed to simulate interpersonal communication, while extraverts being the opposite of introverts are expected to seek these types of source out. This leads to the following hypotheses:

Hypothesis 7a: Introversion will negatively moderate the relationship between relationalism and source selection. Specifically, the relationship between relationalism and source selection will be weaker when introversion is high.

Hypothesis 7b: Extraversion will positively moderate the relationship between relationalism and source selection. Specifically, the relationship between relationalism and source selection will be stronger when extraversion is high.

Personality is not the only source that is expected to impact how an individual would feel about social interactions. Individualism and its opposite, collectivism, can be viewed as

residing in a culture, but they can also be viewed as residing within an individual, where they are referred to as ideocentrism and allocentrism, respectively (Brewer & Chen, 2007; Carpenter & Radhakrishan, 2002; Leung, 1989; Wasti, 2003). As was discussed in the literature review, ideocentrics endorse values, attitudes, or norms consistent with notions of independence and uniqueness versus allocentrics who espouse interdependence and subservience to the wishes of the group (H. C. Triandis, Leung, Villareal, & Clack, 1985; Wasti, 2003).

In terms of interpersonal relationships, ideocentrics have a tendency to have more groups with which they identify than allocentrics (Gouveia, Clemente, & Espinosa, 2003; Gundykunst, Ting-Toomey, & Chua, 1988). It is expected that these differences in relating to others will extend to the way these types of individuals search for information as well. The differences in the way ideocentrics and allocentrics search for information are that ideocentrics are likely to prefer media sources, such as books or magazines, whereas allocentrics are likely to prefer interpersonal sources (de Mooj, 2004; Laroche et al., 2005). For allocentrics, social ties are strong (Watkins and Liu, 1996); hence, they gravitate toward sources that have relationship content (Gundykunst et al., 1988; Hall, 1976; Hofstede, 1991). For ideocentrics, communication serves primarily as a means of information exchange, whereas for allocentrics, communication serves as a basis for relationship building.

According to social exchange theory, individuals who have strong social ties with others favor the transmission of valued information (Frenzen & Nakamoto, 1993). Having a strong sense of community would lead an allocentric individual toward other individuals or sources that seem like another individual. When consulting another individual for information, the seeker is, in essence, saying that she is unable to accomplish the task without another's help, which leads to the following hypotheses:

Hypothesis 7c: Allocentrism will positively moderate the relationship between relationalism and source selection. Specifically, the relationship between relationalism and source selection will be stronger when allocentrism is high.

Ideocentrics, who exist at the opposite end of the continuum, have no strong sense of community. Instead these individuals are independent and will avoid sources that convey a relationship. These individuals are less likely to rely on others, which suggests the following hypothesis:

Hypothesis 7d: Ideocentrism will negatively moderate the relationship between relationalism and source selection. Specifically the relationship between relationalism and source selection will be weaker when ideocentrism is high.

3.3.5 Control Variables

Not surprisingly, accessibility has been demonstrated to be a principal determinant of information source selection (Culnan, 1983). In most studies, accessibility is operationalized in terms of physical access; however, accessibility can be viewed in broader terms as a multi-dimensional construct composed of physical, interface, and informational access (Culnan, 1983). Accessibility is defined as *the extent to which an individual perceives that any particular source is available for use*. The importance of accessibility in explaining source selection has been clearly demonstrated in communication studies, which argue that individuals only choose easily accessible sources (Culnan, 1984; O'Reilly, 1982). Similarly, information-system accessibility is an important explanatory factor of information system use since individuals want to base their decisions on high quality information (Hart & Rice, 1991; Rice & Shook, 1990).

Information quality has also been shown to be important for information-systems use (Dale L. Goodhue & Thompson, 1995; Wixom & Todd, 2005). The benefit derived from using a source is the quality of information it provides (P. J. Carlson & Davis, 1998). Information quality

is a multidimensional construct comprised of understandability, reliability, and usefulness dimensions (McKinney, Yoon, & Zahedi, 2002). Understandability deals with information being easily comprehended, reliability deals with the accuracy of the information, and usefulness deals with the information contributing to the purpose for which the individual sought information in the first place. Controlling for these aspects of quality addresses the primary benefits an individual seeks information.

Poston and Speier (2005) demonstrate that credibility cues in a knowledge management system differentially impact use. Not only do individuals use a system differently when the information is of lower quality, but the decisions resulting from the use of the knowledge management system are different as well when quality is perceived to be low. Source quality impacts the persuasive effect the knowledge has on decision making. This finding holds regardless of whether a person uses a knowledge-management system or accesses a knowledge broker, such as a consultant (Ko, Kirsch, & King, 2005).

Prior works have consistently demonstrated a positive relationship between accessibility and use as well as between quality and use (Culnan, 1983, 1984, 1985; Hart & Rice, 1991; Kraemer, Danzinger, Dunkle, & King, 1993; O'Reilly, 1982; O'Reilly et al., 1987; Zimmer et al., 2008). For this study, quality and accessibility are control variables in the model. By including two known drivers of source selection, this study is firmly situated in the nomological network.

3.4 Summary of Hypothesis Development

In this chapter, the research model was developed and a set of testable hypotheses (reviewed in Figure 8 and Table 10) were proposed. A new construct called relationalism was developed and operationalized. Five antecedents to relationalism, which are rooted in aspects of interpersonal communication, were also identified and included in the research model.

Relationalism is the source characteristic at the heart of the research model with the expectation that individuals will select sources high in relationalism. Two control variables, quality and accessibility, both of which have a long history in source selection research, were identified and included in the research model (P. J. Carlson & Davis, 1998; Culnan, 1983, 1984, 1985; Gerstenberger & Allen, 1968; O'Reilly, 1982).

Construct	**Definition**
Interactivity	The degree to which an information source can create (or facilitate) a mediated environment that allows the individual to participate in reciprocal message exchanges (Kiousis, 2002).
Vividness	The representational richness of the source as how it presents information to all the user's senses (Steuer, 1992).
Customizability	The ability for an individual to modify a how a source presents its information to meet the needs of the individual (Kalyanaraman & Sundar, 2006; Kobsa et al., 2001).
Homophily	The degree to which individuals in a dyad are congruent or similar in certain attributes (Lazerfeld & Merton, 1954).
Relationalism	The perception that an individual can form a relationship with a source.
Multiplicity	The number of details an individual must address when completing a task.
Uncertainty	The inability to determine fully the optimal way to implement a solution.
Introversion	The state of or tendency toward being wholly or predominantly concerned with and interested in one's own mental life (Hills & Argyle, 2001).
Allocentrism	The state when individuals are concerned with the interests of their social group over their own (Harry C. Triandis et al., 1988).
Source selection	Selection occurs when the individual decides to use the information in the source to address the originating need.
Quality (comprised of usefulness, understandability, and reliability)	Usefulness is how well the information contributes to the information need. Understandability is how easily an individual can comprehend the information. Reliability is how accurate the information is.
Accessibility	The extent to which an individual perceives that any particular source is available for use.
Table 9. Review of the constructs and their definitions.	

Task and seeker characteristics play moderating roles in the model. Task characteristics are operationalized as two types of task complexity—multiplicity and uncertainty. This conceptualization is unique in information seeking research. Most previous works have focused

solely on the multiplicitous aspects of complexity and have left the uncertain aspects unexplored (D. J. Campbell, 1984; D. J. Campbell & Ilgen, 1976).

Individual characteristics are also present in the model. Instead of looking at demographic characteristics, psychologically oriented constructs are used. Since relationalism deals with how the relationship potential of a source is perceived, the research model needs to explicitly address the types of individuals who are inherently more (or less) likely to form relationships with other individuals. As a review, the study constructs with their definitions are presented in Table 9.

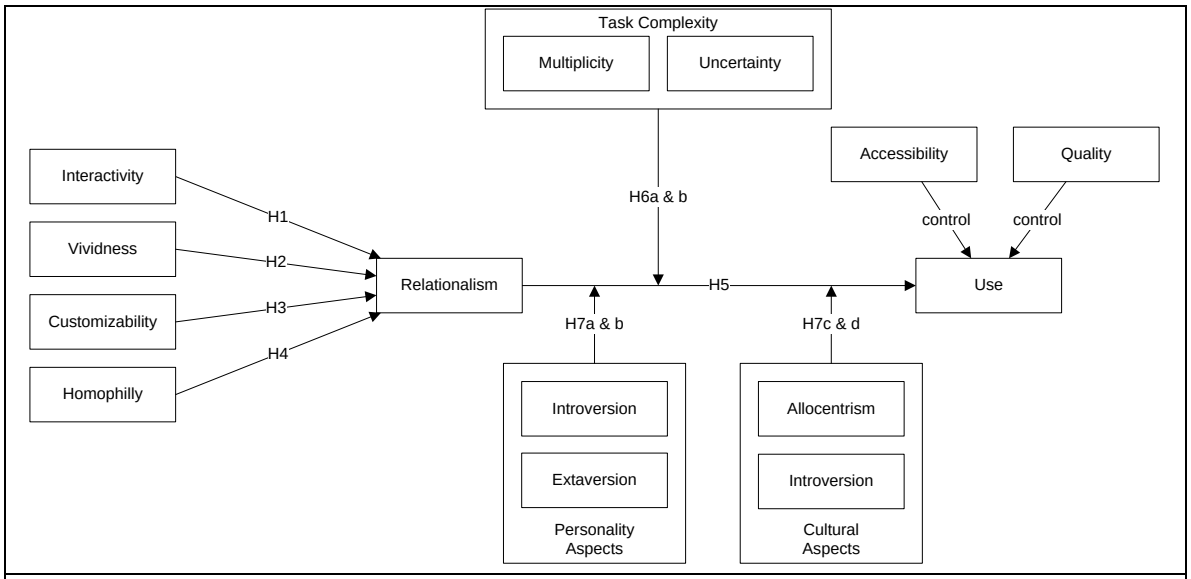


Figure 8. Research model revisited.

The next chapters develop the specific dual methodologies that will be used to test the research model. Chapter 4 details the experimental design, which entails the factors under investigation and describes the experimental equipment. Also discussed are the subjects to be used and the data analysis plan, including sample size calculations that will provide an

acceptable level of power for the experiment. Chapter 5 details the survey design, which presents the survey items and details the method of data collection and analysis.

Hypothesis 1:	Interactivity will have a positive relationship with relationalism.
Hypothesis 2:	Vividness will have a positive relationship with relationalism.
Hypothesis 3:	Customizability will have a positive relationship with relationalism.
Hypothesis 4:	Homophily will have a positive relationship with relationalism.
Hypothesis 5:	There will be a positive relationship between relationalism and source selection.
Hypothesis 6a:	Multiplicity will positively moderate the relationship between relationalism and source selection.
Hypothesis 6b:	Uncertainty will positively moderate the relationship between relationalism and source selection.
Hypothesis 7a:	Introversion will negatively moderate the relationship between relationalism and source selection.
Hypothesis 7b:	Extroversion will positively moderate the relationship between relationalism and source selection.
Hypothesis 7c:	Allocentrism will positively moderate the relationship between relationalism and source selection.
Hypothesis 7d:	Ideocentrism will negatively moderate the relationship between relationalism and source selection.
Table 10. Review of the study hypotheses.	

Chapter 4: Experimental Design

This chapter develops the experimental design that will be employed to test the research model. Due to the size of the research model, two experiments will be conducted, as shown in Figure 9. Furthermore, since each experiment has a different purpose, each experiment will be detailed separately. Collectively, the experiments address the different research questions posed in Chapter 1. Experiment 1 addresses the first research question: "what are the antecedents to relationalism?" Experiment 2 addresses the other research questions: "do individuals prefer high relationalism sources?" and "does the preference for high relationalism sources depend on the nature of the information task?"

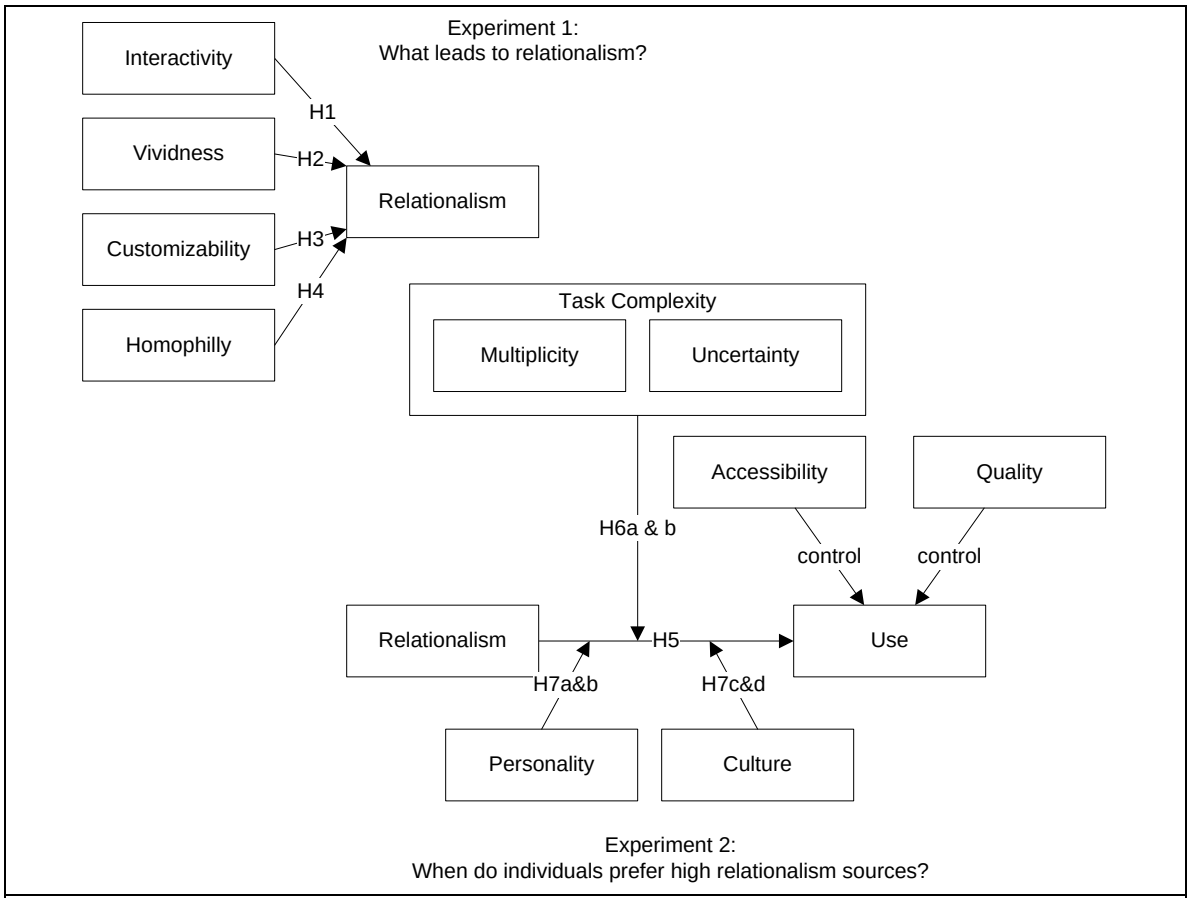


Figure 9. Experimental models.

Section 4.1 will detail Experiment 1, and Section 4.2 will detail Experiment 2. In each section, the experimental factors under investigation are detailed, the required experimental materials are developed, the procedures are described, the subject recruitment is discussed, and the experimental scales are shown. Finally the pre- and pilot-testing plans are presented along with the power analyses and the proposed plan to analyze the data once it is collected.

Both experiments will use a post-test only design (D. T. Campbell & Stanley, 1963). This is an experimental design for which subjects are randomized into their respective treatment conditions, the experimental manipulation is applied, and the relevant outcome measure is captured (see Figure 10). This is a powerful experimental design that addresses all eight threats to internal validity which are shown in Table 11 (D. T. Campbell & Stanley, 1963).

R X O R O
R = randomization, X = experimental treatment, O = outcome measured
Figure 10. Post-test only control group experimental design.

A distinction between a source and a type of source needs to be made. The types of sources that exist at the aggregate level are websites, books, magazines, other individuals. Whereas a source is a particular instance of a type of source. Examples of a source include the *Physicians' Desk Reference*, a supervisor, or cnn.com. The experiment will use a single source type—a website—but subjects will have access to eight different websites during the experiment from which to choose. By focusing on a single type of source, the design elements can be carefully controlled, which will allow for stronger conclusions to be drawn from the experiment. This increased control comes at the expense of other sources and, thus, limits the generalizability of the findings. This concern is addressed in the next chapter where the survey is developed.

Threat	Definition
History	An outside event or occurrence produces the observed effect.
Maturation	The effect is due to the passage of time, which causes physical or psychological changes in the subjects.
Testing	The effect is due to the previous administration of the same test.
Instrumentation	The effect is due to changes in the instrument being used to measure the effect.
Statistical regression	Experimental groups are formed based on extreme placement scores.
Selection	Experimental groups are formed nonrandomly.
Experimental mortality	Differences in dropout rates among experimental treatment conditions are due to the condition itself.
Selection interaction	An array of threats whereby a selection threat is combined with one of the other threats. An example is when one experimental group is dominated by members of a certain fraternity (selection threat) that had a party the night before the experiment (history threat); the results for that group could potentially be altered due to lasting effects from the party.

Table 11. Threats to internal validity.

In addition to both experiments employing a post-test only design, they will also share the same experimental hardware. There is also a large degree of overlap in the software used in the experiments as well. Both experiments will be conducted in a self-contained lab consisting of one server and four clients. The server is a LAMP server running Ubuntu Linux version 8.04, Apache version 2.2, MySQL Server version 5.1, and PHP version 5.2.8. The clients are 4 netbook computers attached to 22” monitors with a screen size of 1680x1050 pixels. The clients will only be able to access the websites from the server, and all other internet access will be blocked.

The server is a dual core Pentium computer running at a clock speed of 1.87GHz with 3GB of RAM. The server with only four clients will be able to handle any sort of load placed upon it without degrading the surfing experience of the end user since delays unnecessarily irritate end-users and increase the likelihood of them moving to another website (Galletta, Henry, McCoy, & Polak, 2006).

The clients are identical netbooks. Each has an Intel Atom processor running at 1.6GHz with 1GB of RAM. All run Windows XP home and have MS Internet Explorer. The 22" monitor provides enough screen space to avoid eye strain. The netbooks also have a separate keyboard and mouse so subjects will not be forced to use those that come with the netbook. These computers can easily render the experimental sites without delays or other problems.

The experimental software will be detailed in subsequent sections. A total of 8 complete websites were developed for this study. All 8 sites will be used in Experiment 1, but only 5 of them will be used in Experiment 2. The reason for this will be detailed further in subsequent sections in this chapter.

4.1 Experiment One

In the first experiment the antecedents to relationalism are investigated. The antecedents to relationalism will be manipulated in order to influence the subjects' perceptions of relationalism. In particular subjects will be exposed to a political website. The website is designed to engender positive feelings from republican subjects and negative feelings from democratic subjects. The goal of this experiment is to investigate the relationships between the antecedents and relationalism without regards to how individuals search for information.

4.1.1 Factors under Investigation for Experiment 1

Experiment 1 will focus on the antecedents to relationalism, interactivity, vividness, customizability and homophily. The goal of this experiment is to determine if source designers can directly manipulate relationalism, thereby impacting the likelihood that an individual will select that source.

4.1.2 Experimental Software

The software requirements for the experiment include eight different websites. The websites contain identical information and vary only in terms of interactivity, vividness, and customizability. Further, the information contained in each version of the sites will be sufficient to address any of the experimental tasks a subject is given. Websites were selected as the information sources because knowledge-management systems are typically web based, and it can be assumed that the experimental subjects will be familiar with the concept and layout of websites.

As discussed in the previous chapter relationalism can vary within an instance of a particular source. In this experiment only websites are under consideration which excludes all other types of sources. This is part of the reason this research employs multiple methods. In the survey this is no arbitrary limit placed upon sources unlike in the experiment.

The websites are based around a fictitious political website for the republican governor of North Dakota. North Dakota was selected as the target state because subjects are not familiar with North Dakota other than knowing the most basic information about it. Further, subjects are not familiar with who the governor of North Dakota is or what his stance on various issues is either. This allows for a website to be designed that should achieve the desired response from subjects. The importance of this particular dimension will be developed in the next section.

The structure of each website will be identical. Each website will contain 12 individual pages that contain a wide array of information about the governor. Figure 11 shows the website structure. Each line in Figure 11 represents a hyperlink. Setting the navigation in this manner will force subjects to drill down into the website and back up in order to drill down again. This layout

maximizes the number of pages a subject sees as she navigates the site, which leads to more accurate perceptions of relationalism and its hypothesized antecedents.

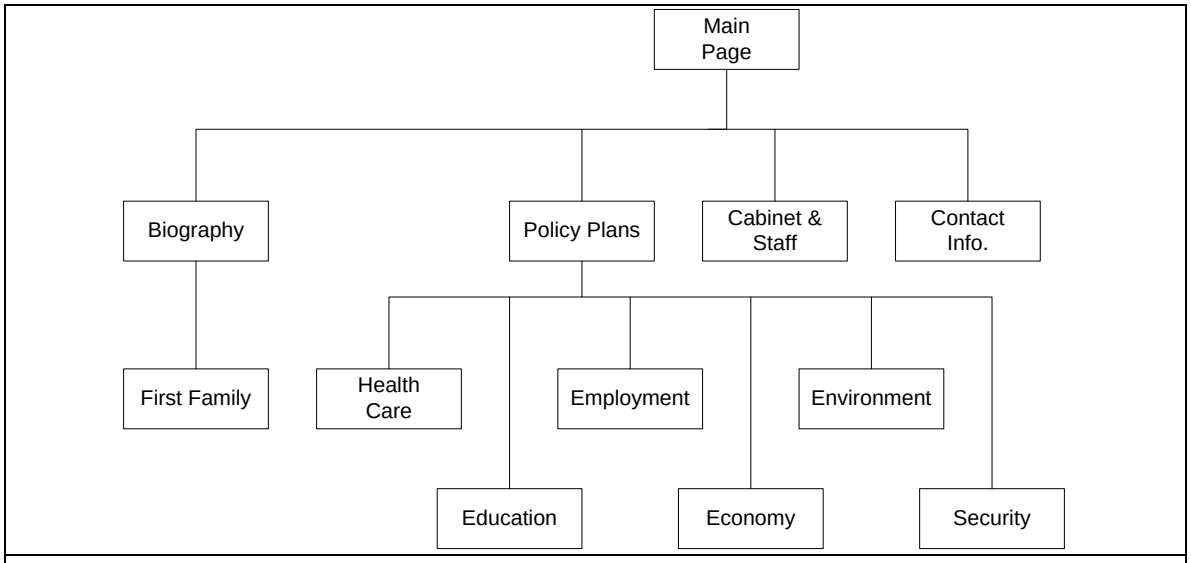


Figure 11. Experimental website structure.

4.1.3 Experiment 1 Procedures

This section develops the procedures subjects saw as they participated in Experiment 1. Subjects are exposed to experimental websites that vary in terms of the hypothesized antecedents. Once the subjects familiarized themselves with the website, they rated its relationalism and they also completed items for the antecedents. After rating each website, subjects played a simple game to clear their minds before proceeding to the next part of the experiment. The exposure to the game provides subjects with a definite break point between the experiment sections and minimizes the chance that subjects' memories will blur the different sites together. The flow of the experiment is shown in Figure 12.

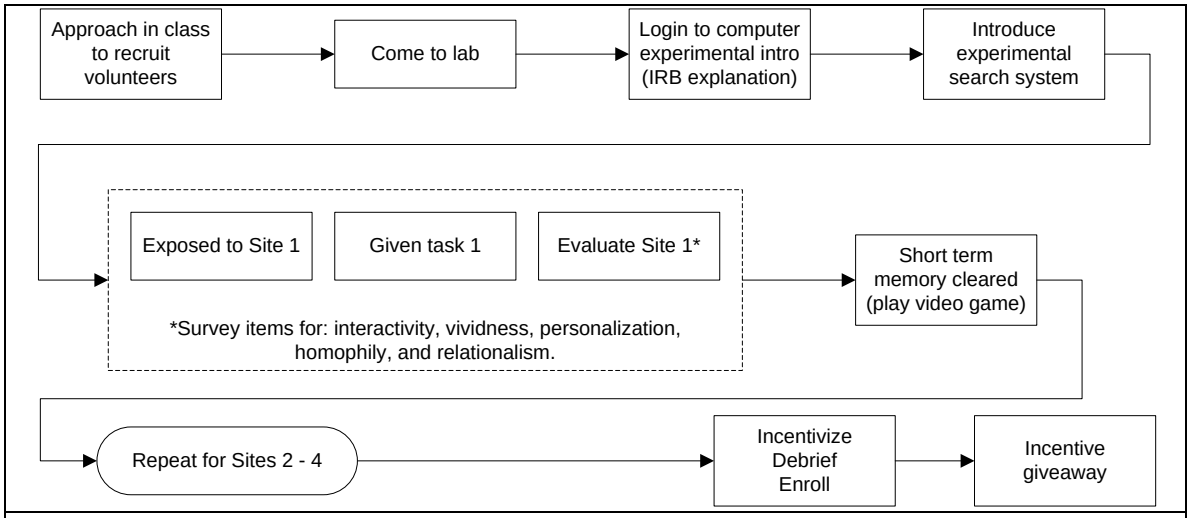


Figure 12. Flowchart of Experiment 1 procedures.

As shown in Figure 12, all subjects will be recruited and then informed of their rights as an experimental subject. For each site, the subjects will follow several steps:

- Subjects will be exposed to the site.
- Subjects will be given a task that will require them to surf the site. The actual accomplishment of the task is not relevant. The purpose is for the subject to become familiar with the site so the next step is meaningful.
- Subjects will respond to survey items for all antecedents and relationalism.
- Subjects will then play a simple video game that will clear their short-term memory.
- The process begins anew with a different experimental site.

The theory of homophily states that an individual prefers to interact with like-minded others; this is especially true when political affiliation is considered, as friends tend to have similar political views (L. L. McCroskey et al., 2006). This is the reasoning behind selecting a political website for this experiment. Subjects were drawn from a small private Catholic college in upstate New York. Subjects who identify with the Republican Party are expected to identify with website content more strongly than subjects who identify with the Democratic Party, as the website will espouse current mainstream conservative ideologies.

In order to develop perceptions of relationalism, subjects were given a series of simple tasks to accomplish on a particular website. The tasks are there to make sure the subjects move through the site and experience its features and content. Sample tasks are shown in Table 12.

Task 1	How does the governor plan to use the federal economic stimulus package?
Task 2	What is the governor's position on water resources for irrigation and recreation?
Task 3	What experiences have prepared the governor for a career in the elected office?
Task 4	Who are the members of the governor's cabinet?

Table 12. Sample tasks for Experiment 1.

4.1.4 Experiment 1 Websites

The websites were specifically developed for this study. In specifically developing the sites, content can be controlled to elicit the feelings of homophily. The other factors are objectively manipulated resulting in a 2x2x2x2 experimental design. Since only three of the factors are design characteristics, this results in the need to create eight different websites as shown in Figure 13.

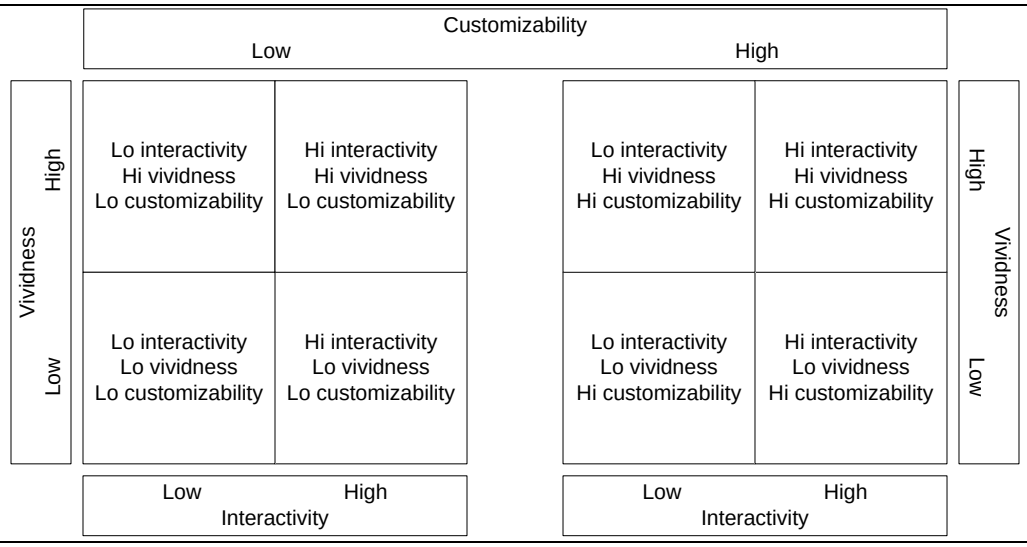


Figure 13. Experimental design.

The content of the eight sites is identical, only the method of its presentation is varied. The variation in presentation reflects the three design constructs—interactivity, vividness and

customizability. The construct definitions (reviewed in Table 13) guided how these features were implemented for the eight websites.

Interactivity is the degree to which an information source can create (or facilitate) a mediated environment that allows the individual to participate in reciprocal message exchanges (Kiousis, 2002).
Vividness is the representational richness of the source as how it presents information to all the user's senses (Steuer, 1992).
Customizability is the ability for an individual to modify a how a source presents its information to meet the needs of the individual (Kalyanaraman & Sundar, 2006; Kobsa et al., 2001).
Table 13. Review of the definitions for interactivity, vividness, and customizability.

The construct definitions for interactivity summed up in a word is communication. To implement this in the experimental websites, the sites were designed to facilitate (or inhibit) communication. Vividness is about adding rich details that engage the senses. To implement vividness color, audio, charts and pictures were used (or not used) adding additional sensory details to the websites. Customizability is about options. The subject can modify the presentation of material to suit their own preferences and needs. Table 14 shows how each construct is implemented across the eight websites.

Interactivity		Vividness		Customizability	
Low	High	Low	High	Low	High
No comment	Comment	B&W charts	Color charts	No layout color	Layout color
No polls	Polls	No pictures	Pictures	No favorites	Favorites
No chat/email	Chat/email	No audio	Audio	No toggle	Toggle

Table 14. Website features for each construct.

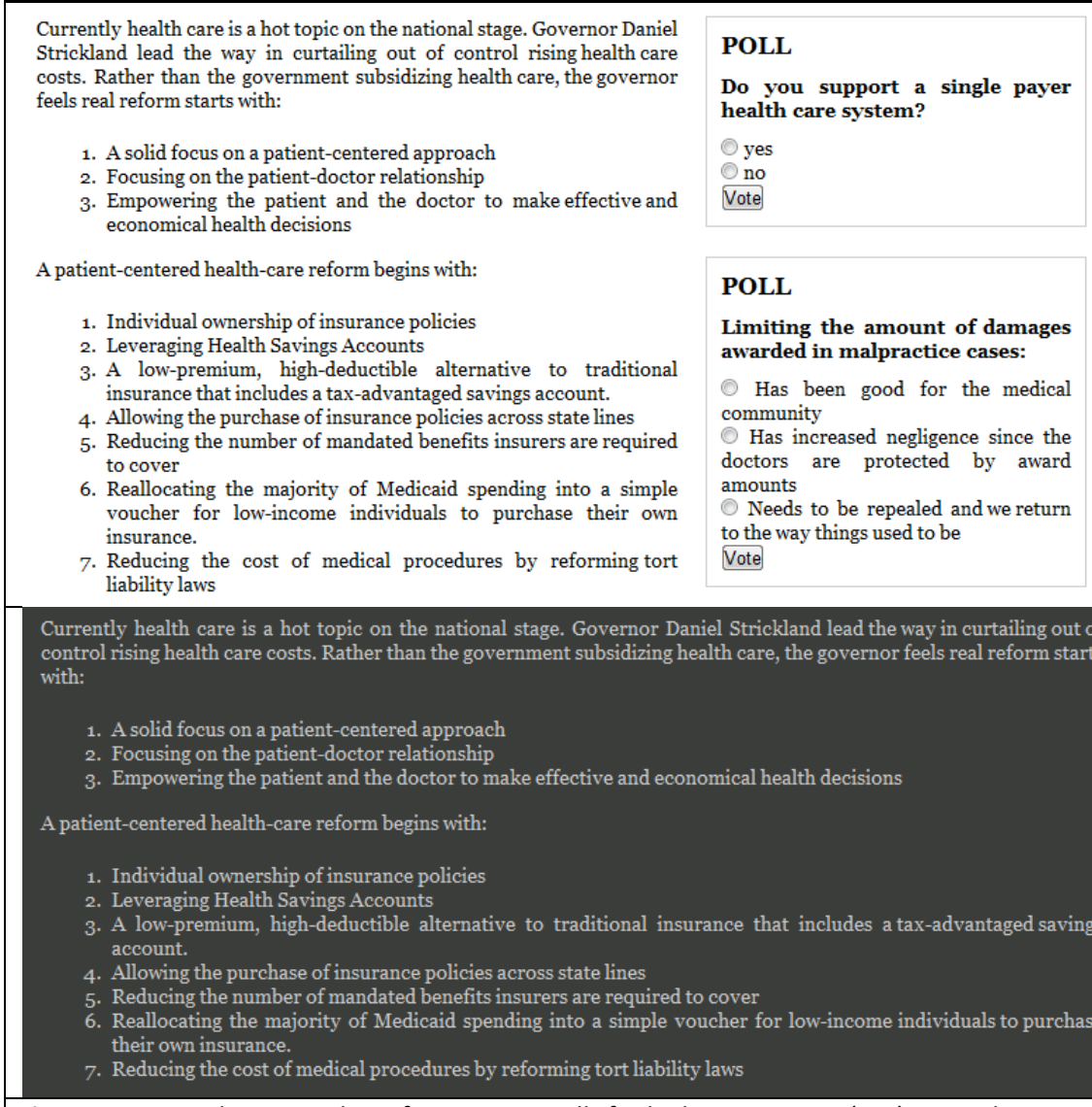


Figure 14. Example screen shot of interactive polls for high interactivity (top) versus low interactivity (bottom) sites.

Figure 15. Example screen shot of interactive comments for high interactivity (top) versus low interactivity (bottom) sites.

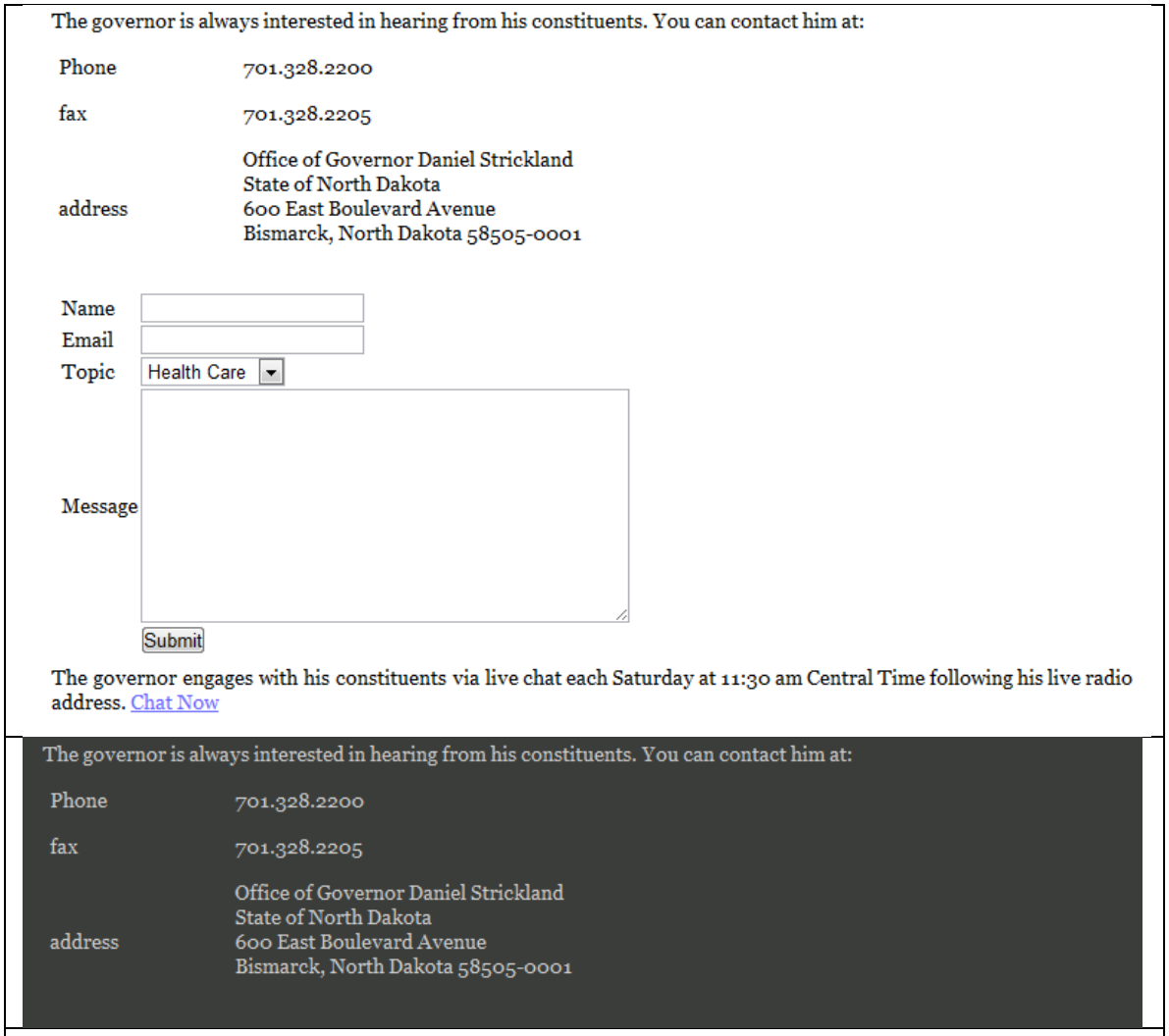


Figure 16. Example screen shot of interactive chat function for high interactivity (top) versus low interactivity (bottom) sites.

The websites implement each construct in three ways. Since interactivity is about communication, in the high interactivity condition subjects can make comments about the page contents, they can vote in online polls, and they can chat with the governor. In the low interactivity condition, these options are not present. Figure 14 shows a sample screen shot of the interactive polls. These polls were connected to a database and when a subject voted in them, the results were returned. Before the experiment started the database was pre-loaded to reflect results that would make conservative subjects happy, and irritate liberal subjects.

Figure 15 shows sample screen shots for the comments function. Subjects could make comments about the site content. As with the polls, the comments were stored in a database and would appear once the subject clicked the "Go" button. The comments would be stored for subsequent subjects. As with the polls, the database was preloaded with comments. Most comments were favorable about the site content and reflected conservative philosophies. A minority of the comments reflected liberal thought and some arguments and personal attacks appeared in the comments section. The preloaded comments were done like this for two reasons. First, subjects would be more likely to add comments if comments were already there. Second, it was a way to implement homophily as well. Conservative subjects would see the preponderance of comments they would identify with thereby increasing the homophilous feelings. Liberals would see very few comments they could identify with and the few that were there were surrounded by negative personal attacks.

Figure 16 shows how the chat and email functionality was implemented. In addition to the email box, the governor's email address was also presented at the bottom of every page in the high interactivity condition. No email information appeared anywhere on the low interactivity sites. If a subject tried to chat with the governor, a pop-up window appeared asking the subject to return Saturday morning at 11:30 central time. No data were collected on Saturday mornings to be certain subjects wouldn't discover the deception[7] until it was revealed at the end of the experiment.

Vividness was also implemented via three different methods. The first way vividness was implemented was the usage of charts or no charts. The second way vividness was

[7] The deception being that these sites were made specifically for this study and in no way represented anything about the governor of North Dakota.

implemented was via using pictures to complement the text and in the page banners. The final method for implementing vividness was using audio. When various events happened, the subject heard a message from the governor.

Figure 17 shows how the charts were implemented. Ideally the charts would be used on the high vividness sites and not on the low vividness sites. Due to one of the ways customizability was implemented, some of the low vividness sites also had to have charts. In particular whenever a low vividness condition was crossed with a high customizability condition (lolohi, hilohi) less vivid black and white graphs were used to convey information. The black and white graphs were designed to be more difficult to read.

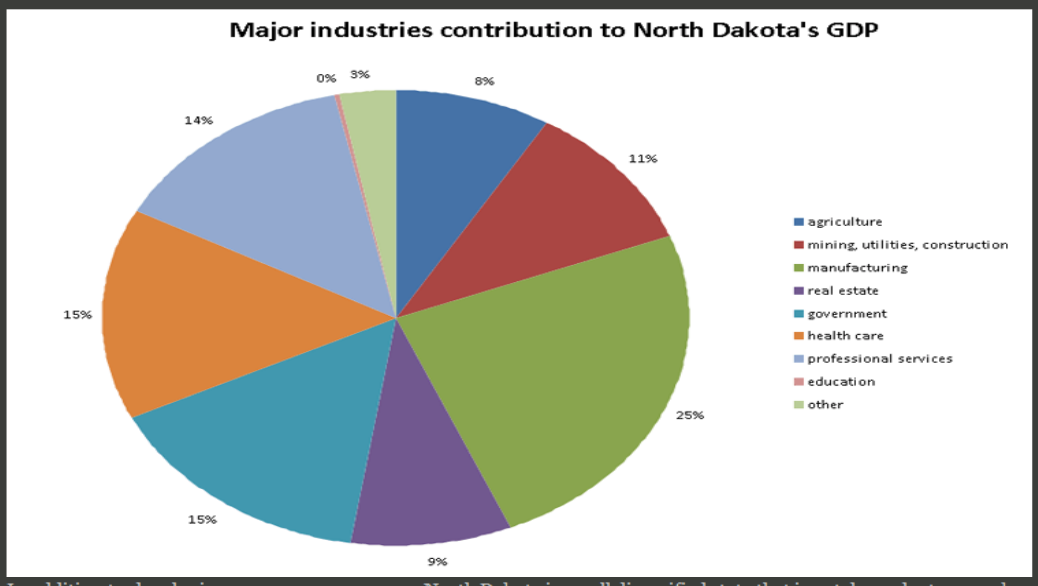
Figure 18 shows how the photos were implemented on the various sites. Photos to complement the text were inserted which broke up the text making a more pleasing layout for subjects. In addition to supplementary pictures, the header information on every page had a picture of the governor subjects could look at along with other images of North Dakota, while the low vivid sites only had a “Welcome to the site of North Dakota” logo on them.

The final method used to implement vividness was through audio when certain events occurred. When first going to the site, a welcome message played from the governor. Since users can quickly grow tired of repeated audio messages these sound messages were set up to play only the first time an event happened. The events and messages subjects heard are shown in Table 15.

In addition to developing our energy resources, North Dakota is a well diversified state that is not dependent on one key industry. North Dakota is the nation's largest producer of

1. Barley
2. Sunflower seeds
3. Spring wheat
4. Durum wheat
5. Farm raised turkeys

Evidence of the diversity of the North Dakota worker can be seen in the wide array of industries our people work in.



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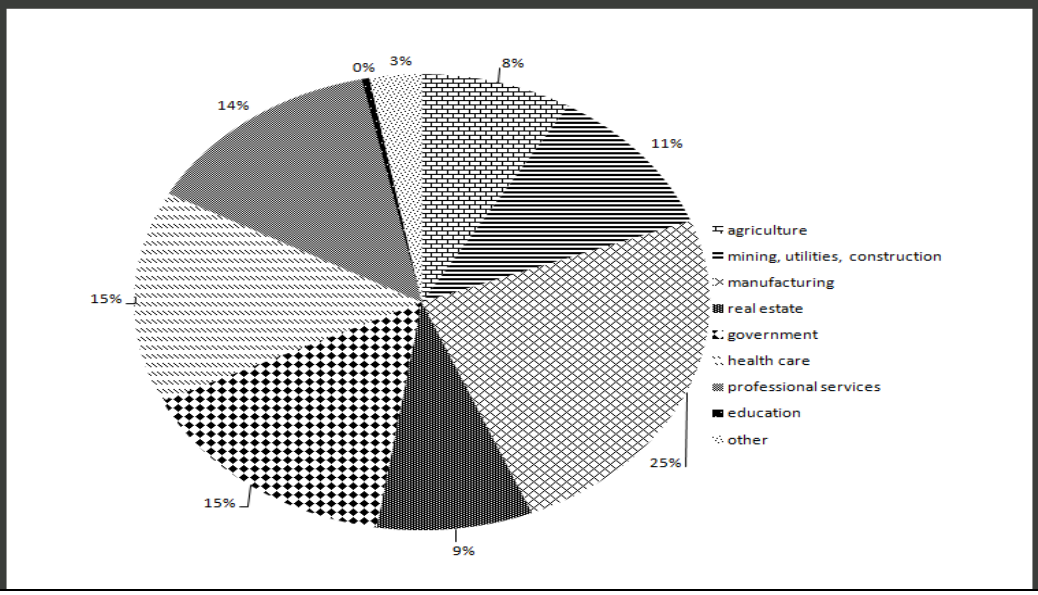
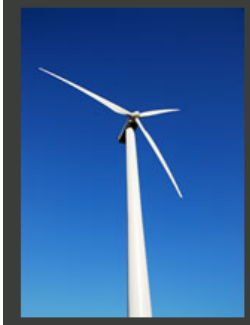


Figure 17. Comparison of high vivid color charts (top) with low vivid B&W charts (bottom) for experimental websites.

In the not-so-recent past, wind energy may have been thought of as prohibitively expensive, or something that occurs only in California. Wind power is being used all over the country: Wisconsin, Minnesota, Iowa, New Mexico, Texas, and Wyoming all have wind-powered turbines, or are building wind turbines, as part of their local power utilities energy generating mix. The idea of harnessing the wind is becoming commonplace as electric customers across the nation demonstrate their willingness to try alternative energy sources, and open their pocketbooks to pay slightly more per kilowatt hour for renewable energy sources than for conventional energy sources.



North Dakota has the greatest wind generating capacity of any state in the nation, yet it is the least utilized of all the renewable energy sources available to North Dakotans. According to figures from the State Energy Office, North Dakota currently has 788 kW of wind capacity that is attached to the power grid. Wind energy systems that have a capacity of 100 kW or greater are located at the Sacred Heart Monastery in Richardton, on land owned by the Spirit Lake Tribe in Devils Lake, and in Belcourt on land owned by the Turtle Mountain Tribe. There are a number of smaller capacity, privately-owned WECS that are also connected to the power grid. This figure, however, does not include the number of people that use wind energy as back-up power that are not attached to the power grid. For comparison, a total of 19,000,000 kW are produced from biomass at the Northern Sun plant in Enderlin and Basin Electric Cooperative's Neal Station in Velva. This pales in comparison to the 517,750,000 kW generated at Garrison Dam in Riverdale.

The governor is committed to creating jobs for North Dakotans and has proposed the creation of a 2 billion dollar wind farm in the wind rich area west of Minot. As proposed this wind farm is capable of producing over 1500 megawatts of power which is enough to power over 450,000 North Dakota homes.

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Figure 18. Comparison of high vivid pictures (top) with low vivid no pictures (bottom) for experimental websites.

Event	Message
Open start page	Hi, I'm Daniel Strickland, welcome to my website.
Posting a comment	I am always interested in hearing from my constituents. Thank you for making a comment.
Open policy plan page	Feel free to click the links below to learn more about my position on issues facing our great state.
Clicking chat	I am not available to chat right now. Please check back Saturday morning.

Table 15. Vivid audio events for high vividness sites.

Customizability was also implemented via three methods though all methods required a subject to create a site account[8]. The first method used was letting subjects choose a color scheme for the site. By default a black outside background was used with a charcoal inner background with light gray text. The second customizability feature allowed subjects to pick three policy pages to appear on the main page so they could quickly access those pages. The last method for customization was displaying information as either a chart or table. To set the features, subjects went to their account page (shown in Figure 19) and could set their choices for all customizability options there.

The color scheme options are shown in Figure 19. A total of 9 different schemes were offered. Predetermined options were used so subjects wouldn't be overwhelmed with an almost infinite number of choices. Plus all the schemes offered have good contrast with insures the site content is legible. If subjects could select their own colors from the entire palette available schemes that were hard to read could be created thereby adversely impacting some of the scale ratings.

Figure 19 also shows how the policy page favorites were implemented. Subjects picked their three favorites and when they went to the main page they saw something like the top

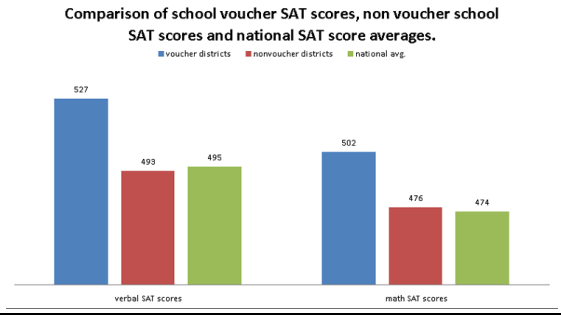
[8] To create an account subject created a login name and password.

portion of Figure 20 while subjects in the low customizability condition saw something like the bottom of Figure 20.

Figure 19. Account page where subjects could set their customizability preferences.

Figure 20. Screen shots for favorites implementation for high customizability (top) and low customizability (bottom).

The final method of implementing customizability is shown in Figure 21. On the left side the chart implementation is shown while on the right the table implementation is shown. Subjects could click a link underneath the chart or table to toggle the view between the two in the high customizability condition.



	voucher districts	Non-voucher districts	national avg.
verbal SAT scores	527	493	495
math SAT scores	502	476	474

SAT score comparison of voucher versus non-voucher schools

Figure 21. Example of chart (left) and table (right) that subjects could toggle between in the high customizability condition.

This section details the implementation of the experimental websites. In Experiment 1 eight sites will be used corresponding to all possible combinations of interactivity, vividness and customizability.

4.1.5 Experiment 1 Subjects

For Experiment 1, undergraduate students will be recruited from the local chapters of college Democrats and college Republicans as well as upper division political science majors. This is important in Experiment 1 where the effects of homophily on relationalism are under investigation. The effects for homophily will be more pronounced when a subject strongly identifies with a particular political party (Kwak et al., 2005). By recruiting subjects from local chapters of college Democrats and college Republicans, the likelihood of recruiting subjects who strongly identify with a particular party is maximized since these subjects took the time and effort to join these political organizations. Subjects will be compensated for participation in the experiment. Each subject will receive $10 upon completing the experiment.

4.1.6 Scales used in Experiment 1

In Experiment 1, interactivity, vividness, customizability, and homophily are all experimentally manipulated. The 8 websites will act as extremes for interactivity, vividness and customization while the subject's own political leanings will provide the homophily

manipulation. As a manipulation check, subjects will also complete perceptual scales that correspond to each of these constructs. This will enable the researchers to verify the objective manipulations were properly perceived by the subjects. Subjects will also complete items designed to measure relationalism. Previously developed and validated items will be used whenever possible, but some measures will be developed especially for this research.

4.1.6.1 Interactivity Scale

Item #	**Item**
Interactivity1	This source allows non-concurrent communication
Interactivity2	This source enables two-way communication
Interactivity3	This source enables concurrent communication
Interactivity4	This source enables conversation
Interactivity5	This source is interactive
Interactivity6	This source is interpersonal
Interactivity7	This source is primarily for one-way communication
Interactivity is the degree to which an information source can create (or facilitate) a mediated environment that allows the individual to participate in reciprocal message exchanges (Kiousis, 2002).	
Scale range: 1=not at all descriptive, 7=very descriptive Stem: Thinking about the source you just viewed, please indicate your level of agreement or disagreement with each of the items below.	
Table 16. Interactivity items.	

In Chapter 3, interactivity was defined as the degree to which an information source can create (or facilitate) a mediated environment that allows the individual to participate in reciprocal message exchanges (Kiousis, 2002). To measure interactivity, seven items were taken from established scales and are shown in Table 16 (McMillan & Hwang, 2002). These items will be used as a manipulation check to verify that subjects perceived the interactivity of a site in accordance with the way the site was designed.

4.1.6.2 Vividness Scale

In Chapter 3, vividness was defined as the way the source presents information to all of an individual's senses (Steuer, 1992). Four vividness items were adapted from the literature and are shown in Table 17 (Jiang & Benbasat, 2007b). These items will be used as a manipulation check to verify that subjects perceived the vividness of a site in accordance with the way the site was designed.

Item #	**Item**
vivid1	The content on this source is animated
vivid2	The content on this source is lively
vivid3	I can acquire information from this source using different sensory channels
vivid4	This source contains information exciting to the senses
The representational richness of the source as how it presents information to all the user's senses (Steuer, 1992).	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: Thinking about the source you just viewed, please indicate your level of agreement or disagreement with each of the items below.	
Table 17. Vividness items.	

4.1.6.3 Customizability Scale

In Chapter 3, customizability was defined as the capacity for a source to tailor its output to the preferences of the seeker. Previous experimental work developed customizability items to use as manipulation checks; these items were adapted for use in this research (Tam & Ho, 2006). These items are shown in Table 18 and will be used as a manipulation check to verify that subjects perceived the customizability of a site in accordance with the way the site was designed.

Item #	Item
Custom1	This source can adapt its presentation to meet my needs
Custom2	The arrangement of this source is made especially for me
Custom3	This source can be tailored to fulfill my information requirements
Custom4	This source provides a variety of content that I can modify to achieve my goals
Custom5	This source is customizable
The ability for an individual to modify how a source presents its information to meet the needs of the individual (Kalyanaraman & Sundar, 2006; Kobsa et al., 2001).	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: Thinking about the source you just viewed, please indicate your level of agreement or disagreement with each of the items below.	
Table 18. Customizability items.	

4.1.6.4 Homophily Scale

In Chapter 3, homophily was defined as the tendency for individuals to associate and bond with similar others (Lazerfeld & Merton, 1954). Since the experimental websites are for a fictitious conservative politician, homophily will be measured with the item shown in Table 19.

Please choose the item which best reflects your political values.
Scale range: Very conservative…conservative…moderate…liberal…very liberal
The degree to which individuals in a dyad are congruent or similar in certain attributes (Lazerfeld & Merton, 1954).
Table 19. Experimental homophily item.

In addition to the single item above, homophily will also be measured using the McCroskey et al. (1975) scale which is shown in Table 20. A semantic differential scale uses pairs of opposites to assess how one perceives the target, the main advantage being that it forces a participant to focus on degree since the categories are provided (Agheyisi & Fishman, 1970).

Item #	Item
phily1	This website does not think like me … This website thinks like me
phily2	This website behaves like me … this website does not behave like me
phily3	This website is similar to me … this website is different from me
phily4	This website is unlike me … this website is like me
The degree to which individuals in a dyad are congruent or similar in certain attributes (Lazerfeld & Merton, 1954).	
Stem: Below are a set of 4 polar opposite phrases. Continuing to think of the source just viewed; please indicate where you stand on these continuums.	
Table 20. Homophily items.	

4.1.6.5 Relationalism Scale

Throughout this document relationalism has been defined as the perception that an individual can form a relationship with a source. Relationalism is a new construct being developed in this research; hence, items to measure relationalism are developed specifically for this study.

When developing items for the relationalism scale, the entire conceptual domain of the construct is captured, which includes the immediacy/affection and the receptivity/trust aspects of a communal relationship (Walther & Burgoon, 1992). The proposed items are shown in Table 21 along with the area of the communal relationship each item is designed to measure. Much like the information-type and customizability scales, the measure for relationalism will be subjected to additional analysis to demonstrate its reliability and validity. The proposed method for ascertaining the reliability and validity of the relationalism scale is developed in Section 4.1.7. These items will be subjected to item analysis and purification in Chapter 6 where the final scale will be presented.

Item #	Item
Rel1 (I/A)	Using this source was like talking to another person
Rel2 (I/A)	This source was personable
Rel3 (I/A)	I felt like I was having a conversation when using this source
Rel4 (I/A)	I have a good relationship with this source
Rel5 (R/T)	This source was unresponsive to my needs
Rel6 (R/T)	This is a trustworthy source
Rel7 (R/T)	This is a sincere source
Rel8 (R/T)	I felt like this was a reasonable source
Rel9 (I/A)	I felt like this source listened to me
Rel10 (I/A)	I felt like this source liked me as a person
Relationalism: The perception that an individual can form a relationship with a source. Immediacy/Affection: Is the source conversational? Is the individual involved with the source? Receptivity/Trust: Are there expressions of rapport, openness and trust when interacting with the source?	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: Thinking about the source you just viewed, please indicate your level of agreement or disagreement with each of the items below.	
Table 21. Likert-scaled relationalism items.	

4.1.7 Power Analysis for Experiment 1

To calculate the sample size that will yield a particular power, certain assumptions that relate to the effect size, the desired power, and the correlation among the repeated measures have to be made. Effect size is generally classified as small, moderate, and large with the recommended sample sizes for a given power decreasing as one moves from small to moderate to large (Cohen, 1988). When choosing an effect size, an experimenter needs to trade off between finding a significant difference against finding a meaningful difference, assuming that a moderate effect size yields the best compromise between these two competing goals. Power is the complement of a Type II error—the greater the power of a test, the lower the probability of making a Type II error. Convention generally dictates that β is 0.20, which would make the given power for this test 0.80.

Since within factors are being used, the correlation among the factors also needs to be considered. One of the advantages of using a within-factors design is the minimization of the error attributable to individual differences since the same individual is providing multiple data points. In this study, an individual provides data for all four websites; hence, one subject provides four datapoints. Generally, the correlation among the "within factors" is assumed to be 0.50 (Cohen, 1988). Sample size requirements increase as this correlation decreases. To give a conservative estimate of the required sample size, this study will assume that the correlation between the factors is zero.

To calculate the sample size, the G*Power 3 software was used (Faul, Erdfelder, Lang, & Buchner, 2007). This software is freeware available online and eases the tediousness of calculating power. Entering a moderate effect size (f=0.25), an α of 0.05, a power of 0.80, one group (since all subjects will see all conditions), four repetitions (each subject rates four websites), and a correlation among the repeated measures of 0 results in a total N of 45. Figure 22 shows a graph of how power increases due to sample size given the assumptions made above. Allowing for 25% of the sample to be unusable due to missing, incomplete, or unusable data increases the projected sample size to 60 subjects.

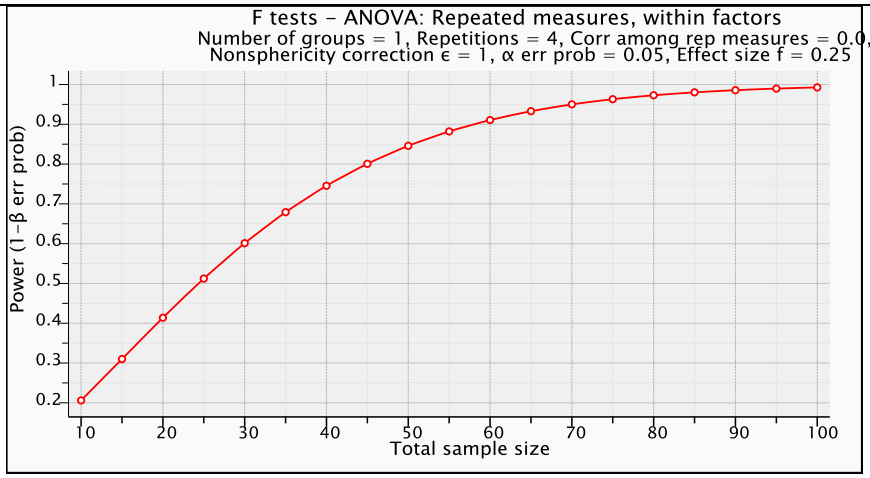


Figure 22. Power as a function of sample size for Experiment 1.

4.1.8 Data Analyses

As discussed in Section 4.1.3 subjects will only be exposed to four of the eight websites. The reason for this decision is discussed in Section 7.1.2. Because it takes two subjects to be exposed to all eight sites, Experiment 1 will have to be conducted as an incomplete block. By using an incomplete block design at least one effect is going to be confounded in blocks. The effect that is confounded is determined by how the blocks are formed. Since higher order interactions often cannot be interpreted, it was determined that the blocks should be arranged in such a way that the three way interaction between interactivity, vividness and customizability be confounded in blocks. Arranging the data this way minimizes the confounding effects and only a single test is lost (Hinkelmann & Kempthorne, 2008).

The blocks will be arranged in such a way that each block will contain two treatment effects that enter positively into the block and two that enter negatively into the block. This means every subject will be exposed to 2 high condition implementations and 2 low condition

implementations for their block. As can be seen in Table 22 all the main effects can be arranged in such a way that each subject is exposed to 2 high and 2 low conditions which correspond to positive and negatively experiencing a particular treatment (Hinkelmann & Kempthorne, 2008).

		Main Effect A	Main Effect B	Main effect C
Block 1	Positive	Hihihi, hilolo	Hihihi, lohilo	hihihi, lolohi
	Negative	Lohilo, lolohi	Hilolo, lolohi	Hilolo, lohilo
Block 2	Positive	Hihilo, hilohi	Hihilo, lohihi	Hilohi, lohihi
	Negative	Lohihi, lololo	Hilohi, lololo	Hihilo, lololo

Table 22. Incomplete block arrangements demonstrating high and low condition arrangement.

4.2 Experiment Two

Experiment 2 focuses on source selection and how the nature of the information task impacts the source an individual chooses to use.

4.2.1 Factors under Investigation for Experiment 2

In Experiment 2 subjects will be briefly exposed to five websites. Then, they will be given an information task and will be asked which website they think is best suited for the task. The websites for Experiment 2 are the same sites used in Experiment 1. Once a subject reports which site they think is best suited for each task, the experiment is concluded.

The tasks will vary in their inherent complexity, thereby making this a 2x2 (see Figure 23) experimental design. Each subject will be randomly assigned one task, thereby making this study a between-subjects design. Conducting the experiment using a between-subjects design will increase the subject requirements but will avoid any sort of ordering effects due to having subjects complete multiple tasks. As a subject uses a site, she will form a relationship with it, which could influence her subsequent selection of that source for other tasks.

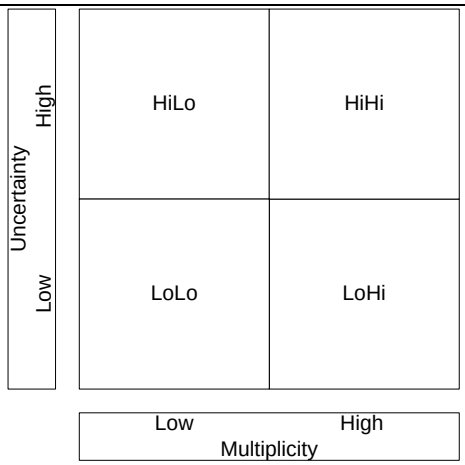


Figure 23. Experimental design for Experiment 2.

Table 23 shows how each complexity factor will be implemented. The implementation is based on the way each aspect was defined in Chapter 3 (reviewed in Table 24). Subjects will randomly be assigned to one of the experimental conditions shown in Figure 23. Subjects will be familiarized with the experimental websites and will then choose one to complete the assigned task.

Factor	How the Factor is Implemented
Multiplicity	• **Low**—the task will have a single criterion to address. • **High**—the task will have several criteria to address.
Uncertainty	• **Low**—the task is fully determinable. • **High**—the task has judgment elements that require the subject to make an educated guess.

Table 23. Experiment 2 manipulations.

Multiplicity is the number of items or details an individual has to address when completing a task.
Uncertainty occurs when even with the best information, the outcome cannot be fully determined.

Table 24. Review of definitions for multiplicity and uncertainty.

4.2.2 Experimental Software

The software requirements for the experiment include five different websites. The websites will contain identical information and will vary only in terms of interactivity, vividness,

and customizability. Websites were selected as the information sources because knowledge-management systems are typically web based, and it can be assumed that experimental subjects are familiar with the concept and layout of websites.

The websites will be a fictitious political websites for the republican governor of North Dakota. North Dakota was selected as the target state because it is expected that most subjects will not be familiar with North Dakota other than knowing the most basic information about it. It is also expected that most subjects will not be familiar with who the governor of North Dakota is or what his stance on various issues are either. This allows us to design a website that should polarize to the intended subjects. The importance of this particular dimension will be developed in the next section.

The structure of each website will be identical. Each website will contain 11 individual pages that contain a wide array of information about the governor. Figure 11 shows the website structure. Each line in Figure 11 represents a hyperlink. Setting the navigation in this manner will force subjects to drill down into the website and back up in order to drill down again. This layout will maximize the number of pages a subject sees as she navigates the site, which will lead to more accurate perceptions of the relationalism antecedents.

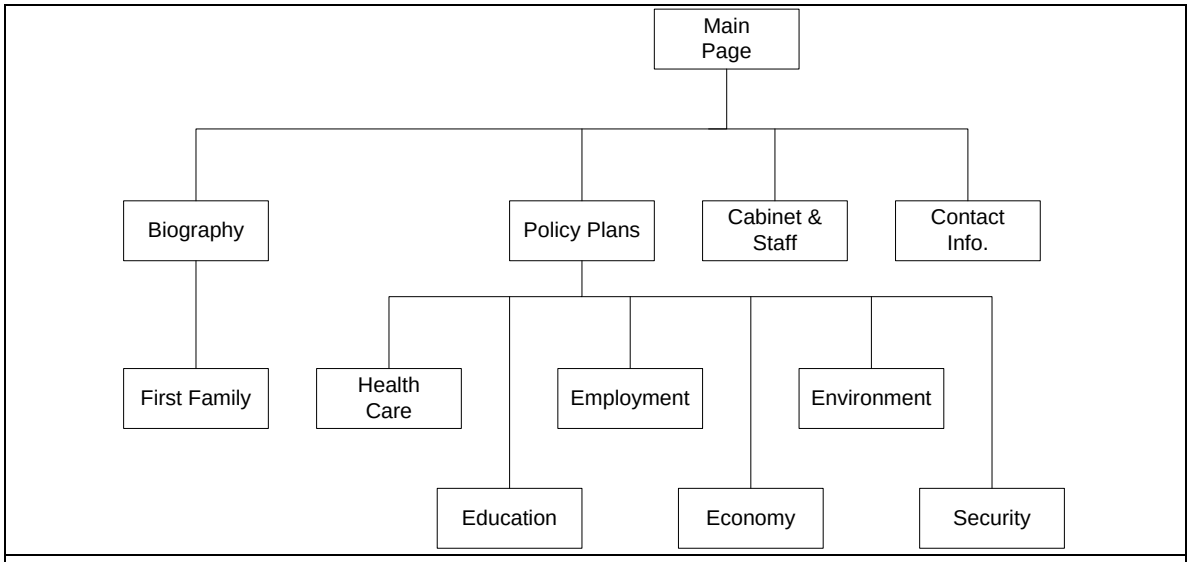


Figure 24. Experimental website structure.

4.2.3 Experiment 2 Procedures

The purpose of Experiment 2 is to investigate the effects of the task on the selection of information sources. Subjects will have the opportunity to become familiar with the eight experimental websites and will then be given a task to complete. Subjects will select one website and use it to complete the task. This process is shown in Figure 25.

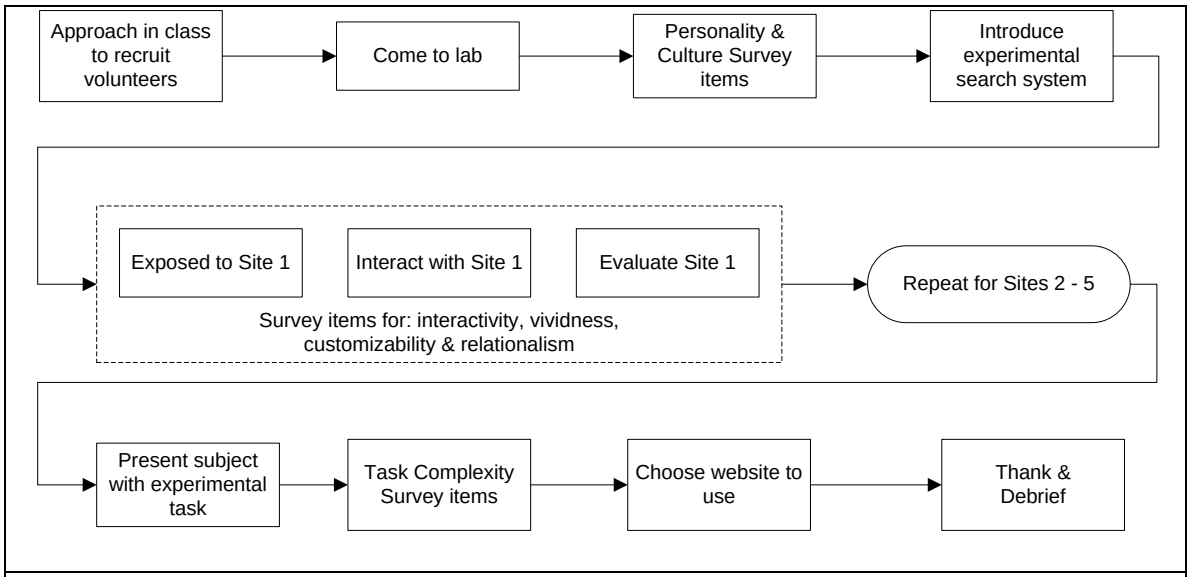


Figure 25. Flowchart of Experiment 2 procedures.

Subjects will be randomly assigned one of four different tasks (shown in Table 23). Each task corresponds to one of the four experimental conditions shown in Figure 23. In the sample tasks, the LoLo task corresponds to low multiplicity and low uncertainty. For this task, the subject needs to find how much oil was produced and verify that the information is correct. The task has only one parameter to deal with and is completely determinable, thereby making it a simple task. The HiLo task corresponds to high multiplicity and low uncertainty. In this task subjects have to verify seven different pieces of information across the website. The task still has multiple parameters and is completely determinable, which makes for a task with high multiplicity since most individuals have difficulty coping with seven or more competing pieces of information (G. A. Miller, 1956). The LoHi task corresponds to low multiplicity and high uncertainty. In this task subjects have to develop a budget for the department of education for the upcoming year. This task has only one parameter to deal with, but the task is not determinable. Subjects will have to use judgment in developing an education budget that they think would be acceptable to the governor. The HiHi task corresponds to high multiplicity and high uncertainty. This task has eight parameters and is not determinable. In addition, it requires the subject to keep track of the governor's position on five political issues, account for three environmental parameters, and use judgment to develop a tentative budget in line with the governor's position on the issues. This task has numerous aspects to track as well as elements of uncertainty, thereby making it a complex task with regard to both multiplicity and uncertainty. Subjects will have to use judgment in developing a state budget that they think would be acceptable to the governor.

All the experimental websites will contain the requisite information to help subjects address the experimental task. While this is a simplification of reality, where individuals often

have many more than five sources to select from, this simplification allows the researcher to focus on the impact of relationalism. The only real difference between these experimental sources is the amount of relationalism each source contains. A subject trying to determine the sufficiency of the information unnecessarily confounds the experiment when the goal is to isolate the effects of relationalism on source selection.

Lo M Hi U: You work for the governor. The governor needs to present his state budget to the state legislature in the coming weeks. He wants you to develop a budget for education funding for the next fiscal year.	**Hi M Hi U:** You work for the governor, and he needs to present his budget for the next fiscal year to the state legislature. The governor has asked you to prepare a first pass of next year's budget. Taking into account the money spent on last year's budget, the governor's position on the environment, education, health care, employment, security, the economic downturn, and the federal stimulus package, develop a state budget.
Lo M Lo U: You work in the governor's office and are responsible for keeping the governor's website current. The extraction of oil from the Bakken formation is dependent upon the price of oil, and the amount of oil produced can vary widely from year to year. A report you received from the oil companies says 6,000,000 barrels of oil were produced in North Dakota last year. Check to make sure the governor's website accurately reports these current figures.	**Hi M Lo U:** You work in the governor's office and are responsible for keeping the governor's website current. The amount of oil extracted from the Bakken region for the last year was 5,000,000 barrels, education spending per pupil was 4,356 dollars, unemployment in the state is 5.2%, the economy expanded by 1.7%, and the state is partnering with the TSA at the Fargo airport to decrease wait times by installing new full-body scanners. The cost of these new security measures is to be $1,000,000, 80% of which comes from federal money. Verify the website is current, and identify what needs to be updated.
Table 25. Sample experimental conditions for LoLo (left) and HiHi (right).	

The experimental conditions map to the two major dimensions in Campbell's (1988) complexity theory, but these conditions will also be rigorously pretested to make sure the subject population perceive the different aspects of complexity in these scenarios. Further details on the pretesting of these scenarios can be found in Section 4.2.7.

4.2.4 Experiment 2 Websites

The same websites used in Experiment 1 will be used for Experiment 2. The only exception is that only 5 of the 8 websites are being used. The lowest relationalism site (lololo), the highest relationalism site (hihihi) will be used. The other three sites used corresponded to the high condition on each antecedent (hilolo, lohilo, and lolohi). Screen shots of how the high and low features are implemented across all sites are given in Section 4.1.4.

4.2.5 Experiment 2 Subjects

For Experiment 2, undergraduate students will be recruited from the business department. Unlike Experiment 1, where homophily is under direct investigation, recruiting subjects with strong political opinions is less important. Further, subjects from Experiment 1 will be excluded from participating in Experiment 2. Subjects will be compensated for participation in the experiment. Each subject will receive $10 upon her completion of the experiment.

4.2.6 Scales used in Experiment 2

In Experiment 2, multiplicity and uncertainty will be experimentally manipulated. As a manipulation check, subjects will also complete perceptual scales that correspond to multiplicity and uncertainty. Subjects will also complete the relationalism scale for each website before choosing the site they wish to use to accomplish their experimental task. Items corresponding to allocentrism/ideocentrism and introversion/extroversion will also be collected. Previously developed and validated items will be used whenever possible, but some measures will be developed especially for this research.

4.2.6.1 Relationalism Scale

The relationalism scale used in Experiment 2 will be the same as the one used in Experiment 1. By the time Experiment 2 is conducted, the scale will have been pretested and

will have demonstrated acceptable reliability and validity; hence, those steps will not be repeated in Experiment 2. The relationalism items are shown again in Table 26. Whatever final items result from the validation process and are used in Experiment 1, will be used in Experiment 2.

Item #	**Item**
Rel1 (I/A)	Using this source was like talking to another person
Rel2 (I/A)	This source was personable
Rel3 (I/A)	I felt like I was having a conversation when using this source
Rel4 (I/A)	I have a good relationship with this source
Rel5 (R/T)	This source was unresponsive to my needs
Rel6 (R/T)	This is a trustworthy source
Rel7 (R/T)	This is a sincere source
Rel8 (R/T)	I felt like this was a reasonable source
Rel9 (I/A)	I felt like this source listened to me
Rel10 (I/A)	I felt like this source liked me as a person
Relationalism: The perception that an individual can form a relationship with a source. Immediacy/Affection: Is the source conversational? Is the individual involved with the source? Receptivity/Trust: Are there expressions of rapport, openness and trust when interacting with the source?	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: Thinking about the source you just viewed, please indicate your level of agreement or disagreement with each of the items below.	
Table 26. Likert-scaled relationalism items.	

4.2.6.2 Multiplicity & Uncertainty Scale

In Chapter 3, complexity was proposed to stem from one of two basic types of complexity: multiplicity or uncertainty. Multiplicity is complexity due to the number of details inherent in the problem. Uncertainty is complexity due to the inherent ambiguity or conflict in the task. Task complexity is going to be experimentally manipulated as discussed in Section 4.2.4, but as a manipulation check, two items were derived from Goodhue (1998) that correspond to multiplicity and uncertainty. All of these items are shown in Table 27. These items

will be used as a manipulation check to verify that subjects perceived the complexity of the experimental task in accordance with the way the task was designed.

Item #	Item
Mult1	There was a considerable amount of information that had to be processed to complete this task
Mult2	There were large numbers of subtasks requiring specific knowledge and skills that had to be carried out to perform the major task
Mult3	There are quite a large number of steps required to complete this task
Uncer1	This was an unstructured task
Uncer2	This was an ad-hoc, non-routine task
Uncer3	This was an unpredictable task
Multiplicity: The number of details an individual must address when completing a task.	
Uncertainty: The inability to determine fully the optimal way to implement a solution.	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: Thinking about the task you were just assigned, please indicate your level of agreement with the following statements.	
Table 27. Multiplicity and uncertainty items.	

4.2.6.3 Allocentrism & Ideocentrism Scale

In Chapter 3, ideocentrics were defined as individuals who endorse values, attitudes, or norms consistent with notions of independence and uniqueness versus allocentrics who espouse interdependence and subservience to the wishes of a group (H. C. Triandis et al., 1985; Wasti, 2003). These characteristics are opposite ends of a continuum; hence, two scales must be used to measure these traits such that they measure from the construct midpoint to the respective extreme (see Figure 26). To measure the entire continuum, two four-item scales will be used as shown in Table 28 (H. C. Triandis et al., 1985).

Item #	Item
Allo1	I feel good when I cooperate with others
Allo2	if a coworker gets a prize, I would feel proud
Allo3	It is important to me to respect the decisions made by my groups
Allo4	The wellbeing of my coworkers is important to me
Ideo1	I often "do my own thing"
Ideo2	I rely on myself most of the time; I rarely rely on others
Ideo3	I'd rather depend on myself than others
Ideo4	It is important that I do my job better than others
Individuals who are concerned with the interests of their social group, over their own (Harry C. Triandis et al., 1988).	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: Please indicate you level of agreement or disagreement with the following statements.	
Table 28. Allocentrism and ideocentrism items.	

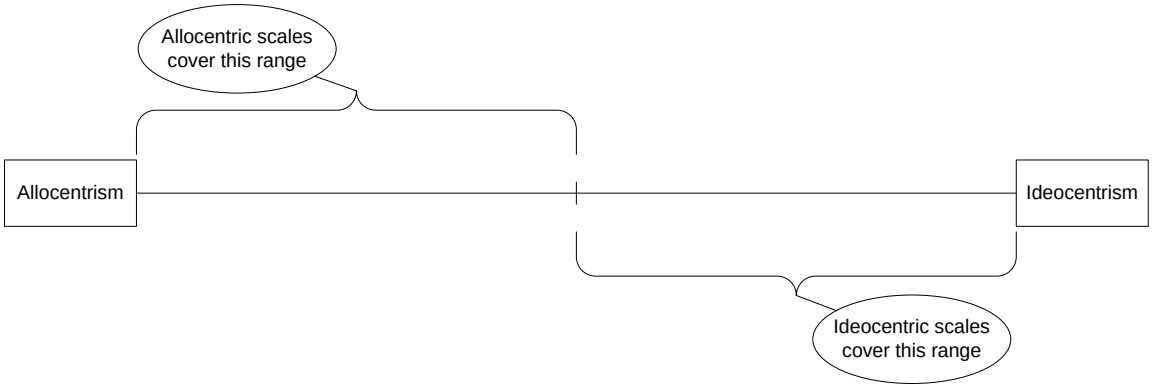


Figure 26. Measuring the allocentrism to ideocentrism continuum.

4.2.6.4 Introversion & Extroversion Scales

In Chapter 3, introversion and extroversion were defined as personality traits that influence how individuals socially orient themselves toward others in their environment (Eysenck & Eysenck, 1985; McCrae & Costa, 1985). Introverts are individuals who shun interpersonal interaction, while extroverts are individuals who seek it out. Despite being opposite ends of the same continuum, this construct is typically measured with items for each end of the continuum, which means individuals who score low on a scale for introversion are

not extroverts and vice versa (see Figure 27). Therefore, two scales are required to capture this construct.

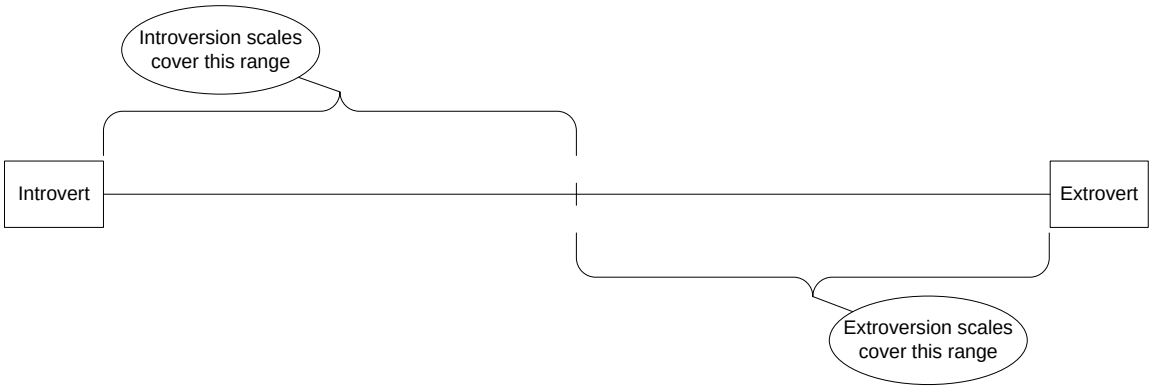


Figure 27. Measuring the introversion to extroversion continuum.

We will use a six-item scale adapted from Cheek and Buss (1981) to measure this construct, which is shown in Table 29.

Item #	**Item**
Intro1	I feel tense when I'm with people I do not know well
Intro2	When speaking with others, I worry about saying something dumb
Intro3	I have trouble looking someone in the eyes
Extro1	I like to be with people
Extro2	I welcome the opportunity to mix socially with people
Extro3	I would be unhappy if I were prevented from making many social contacts
The state of or tendency toward being wholly or predominantly concerned with and interested in one's own mental life (Hills & Argyle, 2001).	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: Please indicate you level of agreement or disagreement with the following statements.	

Table 29. Introversion and extroversion items.

4.2.7 Power Analysis for Experiment 2

To calculate the sample size that will yield a particular power, certain assumptions that relate to the effect size, the desired power, and the correlation among the repeated measures have to be made. Effect size is generally grouped into small, moderate, and large with the

recommended sample sizes for a given power decreasing as one moves from small to moderate to large (Cohen, 1988). In choosing an effect size, an experimenter needs to trade off between finding a significant difference against finding a meaningful difference, assuming that a moderate effect size yields the best compromise between these two competing goals. Power is the complement of a Type II error—the greater the power of a test, the lower the probability of making a Type II error. Convention generally dictates that β is 0.20, which would make the given power for this test 0.80.

Experiment 2 is a between-subjects test, meaning that one subject will be assigned one task. This increases the sample size requirements since the error attributable to individual differences will be greater because subjects are not providing multiple data points.

To calculate the sample size, the G*Power 3 software was used (Faul et al., 2007). This software is freeware available online and eases the tediousness of calculating power. Entering a moderate effect size (f=0.25), an α of 0.05, a power of 0.80, one numerator degree of freedom (each factor will have two levels—high and low), and four groups (each group is assigned a single task) results in a total N of 128. Figure 22 shows a graph of how power increases due to sample size given the assumptions made above. Allowing for 25% of the sample to be unusable due to missing, incomplete, or unusable data increases the projected sample size to 171 subjects.

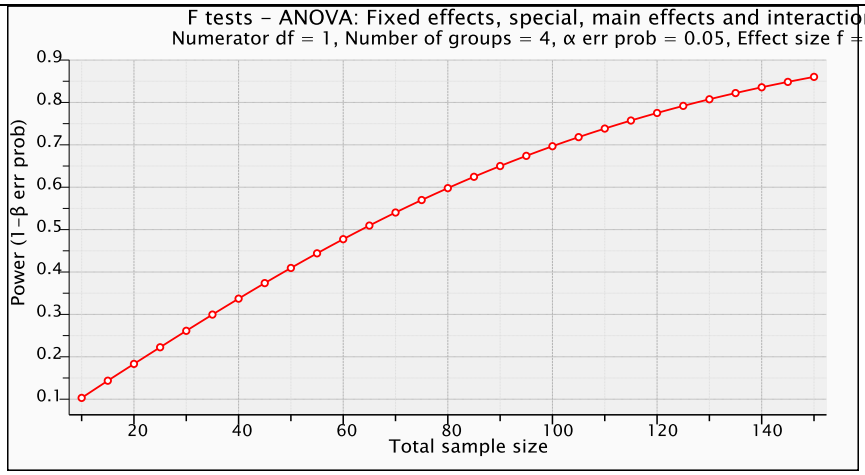


Figure 28. Power as a function of sample size for Experiment 2.

4.2.8 Data Analyses

To analyze the hypotheses multi-level logistic regression is used. Source selection is the dependent variable in the analysis and is a categorical variable. The categorical dependent variable requires a different technique than a continuous dependent variable. This analysis calculates a logit function which is akin to a regression equation except that it represents the log-odds of one outcome relative to another. The results of these analyses are presented in Section 7.3.

4.3 Summary of Experimental Design

This chapter developed the experimental design that will be used to test the study hypotheses. The factors under investigation were discussed for each experiment, and how they will be measured was also covered. In Experiment 1, three of the relationalism antecedents will be directly manipulated, while the other two will be captured in a different manner. While it would be ideal to manipulate all four antecedents directly, homophily cannot be experimentally

manipulated. In Experiment 2, the manipulations include the multiplicity and uncertainty of the task. The materials required to conduct the experiments as well as the procedures that will be employed to collect the data were discussed. The required sample size to achieve the desired power level for each experiment was calculated, and wherever a decision had to be made, the most conservative approach was chosen to make sure the sample size calculation yielded a power that was *at least* 0.80. Lastly, the plan to analyze the data once it is collected was developed. The next chapter develops the proposed survey methodology. The survey offers a real-world perspective on the hypotheses and adds further support to the research findings.

Chapter 5: Survey Methodology

In addition to the experiment discussed in the last chapter, this research also surveys working professionals about their source-selection behaviors to develop a model of source selection. The survey enables the research team to capture the array of sources individuals choose to use, and taken together with the experiment, increases the validity of our findings. Where the experiment focuses on a single type of source—a website, the survey allows respondents to consider any type of source selected when accomplishing work tasks. To test the model, structural equation modeling will be used since the goal of this analysis is to explain variance in the dependent variables and develop causal relationships.

This chapter develops the survey research design, which includes the unit of analysis, key informants, target sample, sample size, and survey administration. Then the construct measures in the research model will be discussed. Wherever possible, previously validated measures from the literature will be used, but several constructs will be measured using new scales. Finally, the chapter concludes with the data analysis plan. This plan includes the development and validation of the measures, the measurement validation, and the structural validation.

5.1 Unit of Analysis

For this survey, the unit of analysis is the individual information seeker. Participants will be instructed to respond to the survey with respect to a particular information-seeking task of their choosing. Since source selection is dependent upon seeker, task, and source characteristics (O'Reilly, 1982), all three of these characteristics will be captured in the survey. Both task and seeker characteristics are expected to remain constant, so they will only be measured once.

Source characteristics and the relationalism antecedents, on the other hand, will need to be measured for each type of source included in the survey. Table 30 provides additional details about each scale and how it will be measured.

The constructs identified as *person x source* and *task x source* will be measured for a particular source. A participant will be asked to provide the name of a source she regularly uses[9]. Then, the respondent will complete survey items for the entire person x source and task x source constructs listed in Table 30, while thinking about that particular source. Due to the length of the survey, respondents will only respond to one source and one task.

Scale	Items	Measurement Level	Source
Relationalism	7	Person X source	Author
Accessibility	4	Person X source	(Zmud, Lind, & Young, 1990)
Quality	6	Person X source	(McKinney et al., 2002)
Interactivity	7	Person X source	(McMillan & Hwang, 2002)
Vividness	4	Person X source	(Jiang & Benbasat, 2007b)
Customizability	5	Person X source	Author
Homophily	4	Person X source	(J. McCroskey et al., 1975)
Multiplicity	3	Task	(D. L. Goodhue, 1998; Xu, 2005)
Uncertainty	3	Task	(D. L. Goodhue, 1998; Van de Ven, Delbecq, & Koenig, 1976)
Introversion	6	Person	(Cheek & Buss, 1981)
Individualism	8	Person	(Singelis, Triandis, Bhawuk, & Gelfand, 1995)

Table 30. Overview of study constructs.

5.2 Key Respondents

Mintzberg (1973) identified ten basic functions common to all managers (see Table 31). These ten functions are divided into interpersonal contact, information processing, and decision

[9] Participants will be explicitly told not to consider search engines when asked to think of a source. Search engines do not contain the information required to address an issue but instead only point the way to where the information can be located. Since the focus of this research is on the sources that contain the information an individual selects, it is reasonable to exclude search engines.

making. Eight of these ten functions deal directly with either information or using information to perform organizational tasks; based on this information, it is believed that managers will make ideal participants for the survey. Since the focus of this research is on source selection, managers are needed from across an organization, not just from a single department.

	Function	**Definition**
Inter. contact	Figurehead	Performs ceremonial and symbolic duties as head of the organization.
	Leader	Fosters a proper work atmosphere and motivates and develops subordinates.
	Liaison	Develops and maintains a network of external contacts to gather information.
Info. proc.	Monitor	Gathers internal and external information relevant to the organization.
	Disseminator	Transmits factual and value-based information to subordinates.
	Spokesperson	Communicates to the outside world on performance and policies.
Decision making	Entrepreneur	Designs and initiates change in the organization.
	Disturbance handler	Deals with unexpected events and operational breakdowns.
	Resource allocator	Controls and authorizes the use of organizational resources.
	Negotiator	Participates in negotiation activities with other organizations and individuals.

Table 31. Mintzberg's (1973) managerial functions.

Our sample for the survey portion of this research will come from individuals in industry. Our goal is to be able to make prescriptions to organizations about how individuals use information sources. Thus, working professionals will be sampled from a market research firm, which will include sample participants who are employed in multiple industries. The main criterion for inclusion in the sample is the individual needs to regularly work with information in accomplishing their tasks. We are developing a model of source selection intended to be applicable to individuals who use information to create new knowledge.

5.3 Sample Size Calculations

Just as in the experiments, a sample size needs to be estimated in order to have adequate power for our statistical tests. The power of a test is based on four factors: the probability of committing a Type I error, the probability of committing a Type II error, the sample size, and the effect size one wishes to detect (Cohen, 1988). The proposed research model can be divided into two portions since mediation effects are not being proposed from the relationalism antecedents to the source selection. From a power standpoint, this research can be divided into the two models shown in Figure 29, and the number of independent variables in each model plays a role in sample size determination.

Based on the disaggregated models in Figure 29, the power analyses will be conducted, and the model that requires the largest sample size will be used to collect all of the data. This way the model that requires the smaller sample size will have a power in excess of the desired 0.80 level. Typically the model with the greatest number of IVs will have the greatest sample size requirements; however, mediation effects increase sample-size requirements. Model 1 has five IVs and no interaction terms, while Model 2 has three IVs and four interaction terms; thus, we will use Model 2 for the sample size calculations.

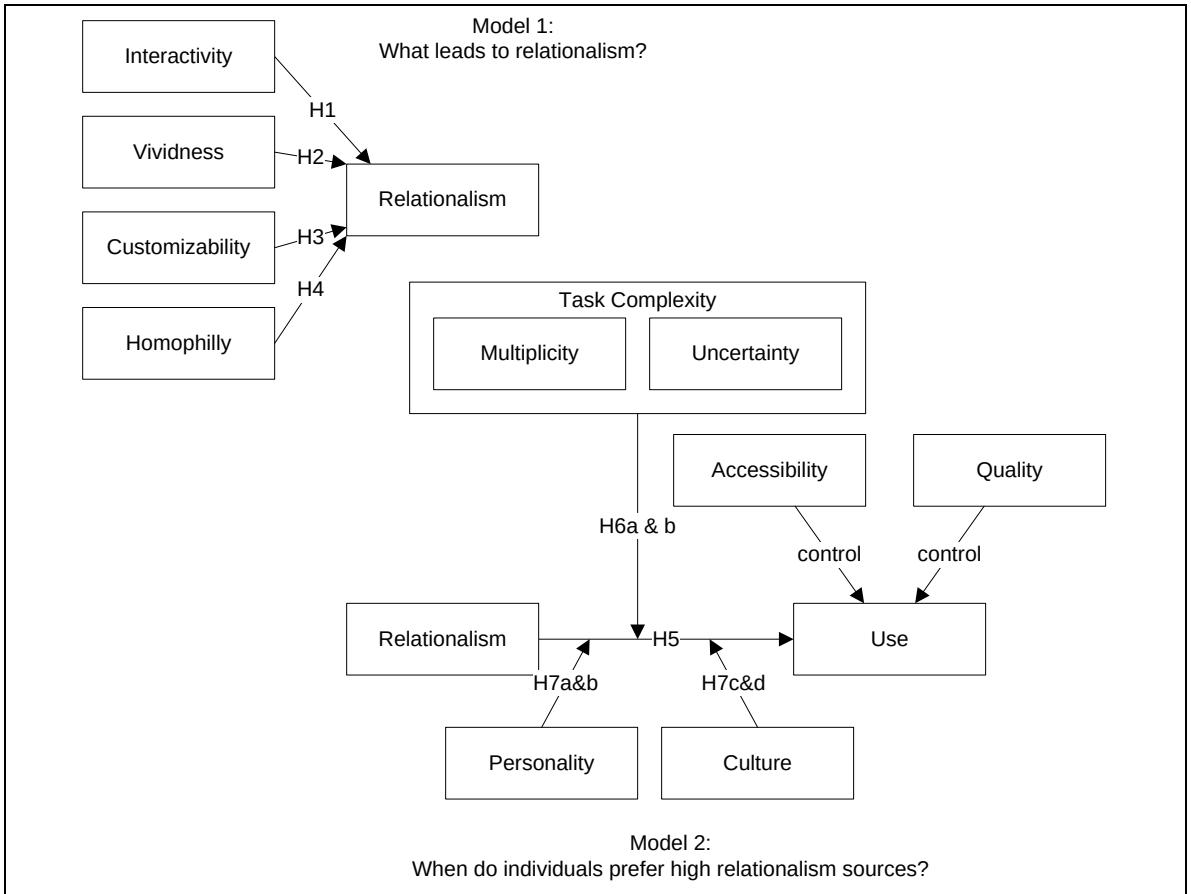


Figure 29. Disaggregated research model.

To calculate sample size, five factors must be specified. First, the power level must be determined. Cohen's (1988) recommended power level of 0.80 will be used for this research. Second, the Type I error rate must be specified; following previous research, an α of 0.05 will be used. Third, the average coefficient of determination between the IVs and the DVs needs to be specified, which corresponds to the measure of effect size. Cohen (1988) specifies the average correlation between the IVs and DVs is 0.10 for a small effect, 0.30 for a moderate effect, and 0.50 for a large effect. Lastly, the average correlation among the IVs also needs to be specified. Ideally, all of the IVs will be independent, but this is an unrealistic assumption. As a basic heuristic, 0.30 is often used, but a pilot sample was collected from which the average

correlation among the IVs can be calculated and used instead of relying on basic heuristics. Two power calculations are provided: one based on generally recommended guidelines and one based on the pilot results:

- **Scenario 1:** If the average correlation among all of the IVs is 0.30 and the average correlation between the IVs and DVs is 0.10, the sample size that provides a power of 0.80 is 204.

- **Scenario 2:** Based on the pilot results, the average correlation among all of the IVs is 0.17, and the average correlation between the IVs and DVs is 0.15; hence, the sample size that provides a power of 0.80 is 121.

Going with the more conservative estimate, the required sample size is 204, and assuming that 33% of the sample will be unusable due to outliers and missing data, a total sample of 306 will be collected.

5.4 Survey Administration

Market Tools (www.markettools.com) will be employed to administer the survey. Market Tools has access to over three million members who are profiled across 500 different attributes. Furthermore, Market Tools reports that their members' collective profile is representative of the U.S. population. To maintain the quality of their respondent panel, Market Tools uses several different quality control methods. One method entails verification of panelist information against extensive databases that contain validated consumer data. Another method entails taking into account the amount of time it takes to complete the survey and analyzing response patterns to identify fraudulent responses. This type of data collection provides greater control for the researcher and has been used successfully in prior academic research (Piccolo & Colquitt, 2006; Porter & Donthu, 2006).

A potential issue with using Market Tools is its panel might be outdated. Panelists can change (or lose) jobs from the time they first enroll with Market Tools. This threat is not cause for great concern because provided the respondent meets the two inclusion criteria specified above, then that individual is an acceptable respondent. To be certain participants come from the specified target population, screening questions to verify our sample will be used. Table 32 contains the screening questions.

Do you work full time? (yes/no)
What is your job title?
I would classify my job as: (clerical, technical, managerial)
I routinely need to find information to accomplish my job tasks (1-7 Likert response)

Table 32. Screening questions.

5.5 Construct Measurement

This section details the measurement of the study constructs and the plan to demonstrate the reliability and validity of these constructs. Some constructs will require the development of new scales to measure them. For these constructs, recommended scale-development guidelines will be followed (Moore & Benbasat, 1991).

5.5.1 Interactivity

In Chapter 3, interactivity was defined as the extent to which users can participate in modifying the form or content of a source in real time (Steuer, 1992). To measure interactivity, seven items were taken from established scales and are shown in Table 16 (McMillan & Hwang, 2002).

Item #	Item
Interactivity1	This source allows non-concurrent communication
Interactivity2	This source enables two-way communication
Interactivity3	This source enables concurrent communication
Interactivity4	This source enables conversation
Interactivity5	This source is interactive
Interactivity6	This source is interpersonal
Interactivity7	This source is primarily for one-way communication
Interactivity is the degree to which an information source can create (or facilitate) a mediated environment that allows the individual to participate in reciprocal message exchanges (Kiousis, 2002).	
Scale range: 1=not at all descriptive, 7=very descriptive Stem: How well do the following items describe the information source you [did/did not] use?	
Table 33. Interactivity items.	

5.5.2 Vividness

In Chapter 3, vividness was defined as the way the source presents information to all of an individual's senses (Steuer, 1992). Four vividness items were adapted from the literature and are shown in Table 17 (Jiang & Benbasat, 2007b).

Item #	Item
vivid1	The content of this source is animated
vivid2	The content of this source is lively
vivid3	I can acquire information from this source using different sensory channels
vivid4	This source contains information that is exciting to the senses
The representational richness of the source as how it presents information to all the user's senses (Steuer, 1992).	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: How well do the following items describe the information source you [did/did not] use?	
Table 34. Vividness items.	

5.5.3 Customizability

In Chapter 3, customizability was defined as the capacity for a source to tailor its output to the preferences of the seeker. No existing scales were suitable for use in this research.

Instead 10 Likert-scaled items were developed to measure customizability, which are shown in Table 35.

Item #	Item
Custom1	This source can adapt its presentation to meet my needs
Custom2	The arrangement of this source is made especially for me
Custom3	This source can be tailored to fulfill my information requirements
Custom4	This source provides a variety of content that I can modify to achieve my goals
Custom5	This source is customizable
The ability for an individual to modify how a source presents its information to meet his/her needs (Kalyanaraman & Sundar, 2006; Kobsa et al., 2001).	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: How well do the following items describe the information source you [did/did not] use?	
Table 35. Customizability items.	

5.5.4 Homophily

In Chapter 3, homophily was defined as the tendency for individuals to associate and bond with similar others (Lazerfeld & Merton, 1954). The homophily items were taken from McCroskey et al. (1975) and are shown in Table 20. A semantic differential scale uses pairs of opposites to assess how one perceives the target, the main advantage of this method being that it forces a participant to focus on degree since the categories are already provided (Agheyisi & Fishman, 1970).

Item #	Item
phily1	Does not think like me…Thinks like me
phily2	Behaves like me…Does not behave like me
phily3	Similar to me…Different from me
phily4	Unlike me…Like me
The degree to which individuals in a dyad are congruent or similar in certain attributes (Lazerfeld & Merton, 1954).	
Stem: The source I [did/did not] use [is]…	
Table 36. Homophily items.	

5.5.5 Relationalism

In Chapter 3, relationalism was defined as an individual's perception that she can form a relationship with a source. Because this is a new construct, a new scale had to be developed to measure relationalism. The scale has 10 Likert-scaled items shown in Table 37. The development of this scale as well as the testing of its reliability and validity will be detailed in the next chapter. These items will be subjected to item analysis and purification in Chapter 6 where the final scale used to hypothesis testing will be presented.

Item #	Item
Rel1 (I/A)	Using this source was like talking to another person
Rel2 (I/A)	This source was personable
Rel3 (I/A)	I felt like I was having a conversation when using this source
Rel4 (I/A)	I have a good relationship with this source
Rel5 (R/T)	This source was unresponsive to my needs
Rel6 (R/T)	This is a trustworthy source
Rel7 (R/T)	This is a sincere source
Rel8 (R/T)	I felt like this was a reasonable source
Rel9 (I/A)	I felt like this source listened to me
Rel10 (I/A)	I felt like this source liked me as a person
Relationalism: The perception that an individual can form a relationship with a source. Immediacy/Affection: Is the source conversational? Is the individual involved with the source? Receptivity/Trust: Are there expressions of rapport, openness and trust when interacting with the source?	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: How well do the following items describe the information source you [did/did not] use?	
Table 37. Likert scaled relationalism items.	

5.5.6 Introversion/Extroversion

In Chapter 3, introversion and extroversion were defined as personality traits that influence how individuals socially orient themselves toward others in their environment (Eysenck & Eysenck, 1985; McCrae & Costa, 1985). Introverts are individuals who shun interpersonal interaction, while extroverts are individuals who seek it out. Despite being at opposite ends of the same continuum, this construct is typically measured with items for each end of the continuum, which means individuals who score low on a scale of introversion are not extroverts and vice versa (see Figure 27). Therefore, two scales are required to capture this construct.

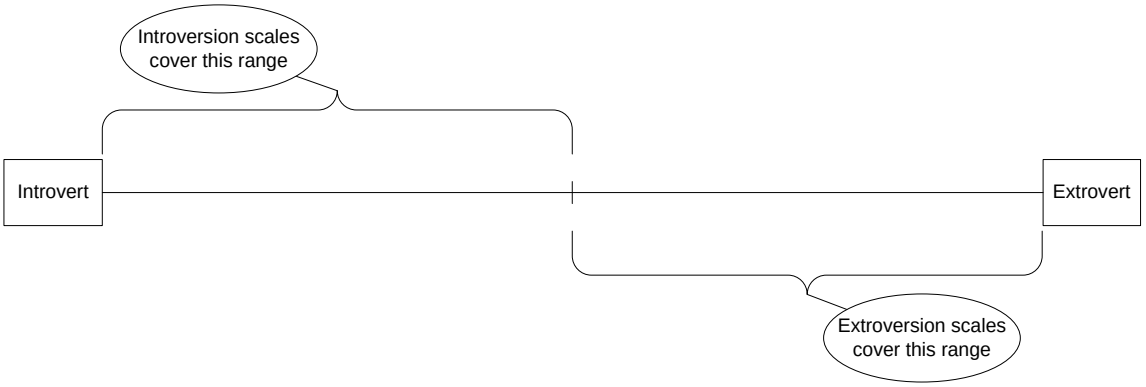


Figure 30. Measuring the introversion to extroversion continuum.

We will use a six-item scale developed by Cheek and Buss (1981) to measure this construct, which is shown in Table 29.

Item #	**Item**
Intro1	I feel tense when I'm with people I do not know well
Intro2	When speaking with others, I worry about saying something dumb
Intro3	I have trouble looking someone in the eyes
Extro1	I like to be with people
Extro2	I welcome the opportunity to mix socially with people
Extro3	I would be unhappy if I were prevented from making many social contacts
The state of or tendency toward being wholly or predominantly concerned with and interested in one's own mental life (Hills & Argyle, 2001).	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: Please indicate how strongly you agree or disagree with the following statements.	

Table 38. Introversion and extroversion items.

5.5.7 Ideocentrism / Allocentrism

In Chapter 3, ideocentrics were defined as individuals who endorse values, attitudes, or norms consistent with notions of independence and uniqueness versus allocentrics who espouse interdependence and subservience to the wishes of a group (H. C. Triandis et al., 1985; Wasti, 2003). Much like introversion and extroversion, these characteristics are at opposite ends of a continuum. Also like introversion and extroversion, two scales must be used to measure these traits such that each construct is measured from the midpoint to the respective extreme

(see Figure 26). To measure the entire continuum, the two four-item scales shown in Table 28 will be used (H. C. Triandis et al., 1985).

Item #	Item
Allo1	I feel good when I cooperate with others
Allo2	If a coworker gets a prize, I would feel proud
Allo3	It is important to me to respect the decisions made by my groups
Allo4	The wellbeing of my coworkers is important to me
Ideo1	I often "do my own thing"
Ideo2	I rely on myself most of the time; I rarely rely on others
Ideo3	I'd rather depend on myself than others
Ideo4	It is important that I do my job better than others
The state of or tendency toward being wholly or predominantly concerned with and interested in one's own mental life (Hills & Argyle, 2001).	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: Please indicate how strongly you agree or disagree with the following statements.	
Table 39. Allocentrism and ideocentrism items.	

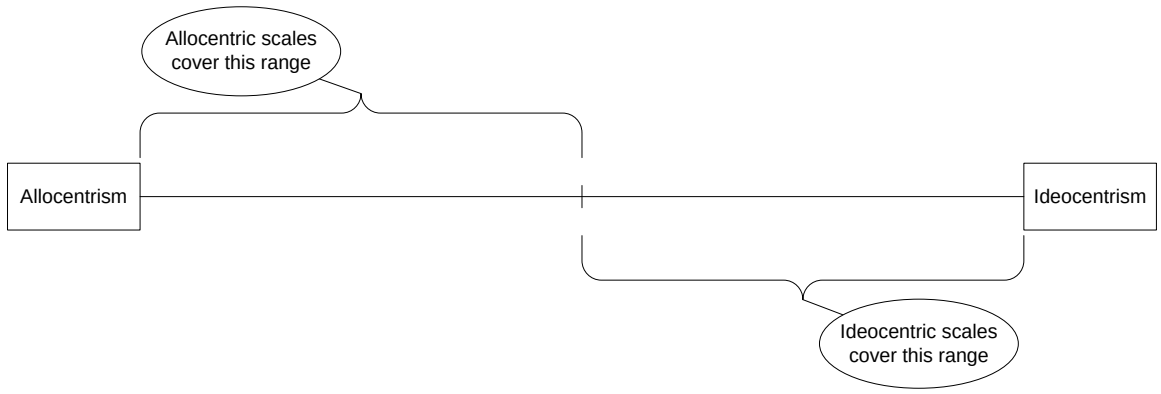


Figure 31. Measuring the allocentrism to ideocentrism continuum.

5.5.8 Task Complexity

For this study, task complexity refers the broad conceptualization of two types of complexity: multiplicity and uncertainty. As defined in Chapter 3, multiplicity is an increase in complexity due to the number of details an individual must attend to, while uncertainty is an increase in complexity due to the inherent uncertainty of or conflict in the task. To measure

multiplicity, three items from Goodhue (1998) and Xu (2005) were used, as shown in Table 27. To measure uncertainty, two items from Goodhue (1998) and Van de Ven et al. (1976) were derived, as shown in Table 27.

Item #	**Item**
mult1	When I go to this source, there is a considerable amount of information that needs to be processed in order to complete the task
mult2	When I go to this source, there are large numbers of subtasks requiring specific knowledge and skills that must be carried out to perform the major task
Mult3	There are quite a large number of steps required to complete this task
Uncer1	When I go to this source, I am dealing with an unstructured business problem
Uncer2	When I go to this source, I am dealing with an ad-hoc, non-routine business problem
Uncer3	When I go to this source, I am working on an unpredictable task
Multiplicity: The number of details an individual must address when completing a task.	
Uncertainty: The inability to determine fully the optimal way to implement a solution.	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: While thinking of the task you just described, please indicate how strongly you agree or disagree with the following statements.	
Table 40. Multiplicity and uncertainty items.	

5.5.9 Source Selection

Source selection occurs when an individual chooses to go to a source. Since the survey does not capture actual source selection, the survey will measure selection a little differently. Respondents will answer survey questions thinking about the typical type of source (book, website, person, etc.) they use when dealing with a particular type of task (simple, complex). Selection for the survey will follow from a respondent's intent to use that source if she was actually involved in an information search. Table 41 shows the selection items.

Item #	Item
use1	Using this source allows me to accomplish tasks more quickly
use2	Using this source enhances my effectiveness on the job
use3	Using this source improves my job performance
use4	Using this source makes it easier to do my job
use5	Using this source increases my productivity
use6	Overall, I find using this source to be advantageous in doing my job
use7	I would probably use this source again
use8	I do not intend to use this source (RC)
use9	I would like to use this source
use10	This source is among my favorites
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: While thinking of the source you [did/did not] use, please indicate how strongly you agree or disagree with the following statements.	
Table 41. Source selection items.	

5.5.10 Control variable scales

We have two control variables in the model: quality and accessibility. Information quality is a multidimensional construct comprised of relevance, reliability, and usefulness dimensions (McKinney et al., 2002). To measure information quality, six items from McKinney et al. (2002) were used, as shown in Table 42.

Item #	Item
qual1	Clear in meaning
qual2	Easy to comprehend
qual3	Accurate
qual4	Credible
qual5	Informative
qual6	Valuable
Usefulness is how well the information contributes to the information need. Understandability is how easily an individual can comprehend the information. Reliability is how accurate the information is.	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree Stem: The information I get from [the source] is…	

Table 42. Information quality items.

Accessibility was previously defined in Chapter 3 as the extent to which an individual perceives that any particular source is available for use. It will be measured with the four semantic differential items from Culnan (1983), which are shown in Table 43.

Item #	**Item**
acc1	Available…unavailable
acc2	Dependable…undependable
acc3	Convenient…inconvenient
acc4	Accessible…inaccessible
The extent to which an individual perceives that any particular source is available for use.	
Stem: This source is…	
Table 43. Source accessibility items.	

5.6 Measurement Approach

Before measuring a construct, its underlying structure must be determined. In addition, the direction of the relationships between the indicators and the constructs needs to be determined. Indicators can either be reflective or formative (Edwards & Bagozzi, 2000). A reflective indicator is a manifestation of a construct. As such, the construct "causes" the indicator; hence, variation in the construct also leads to variation in its indicators (Bollen, 1989). A formative indicator is just the opposite, as indicators are taken to be the "cause" of the construct (MacCallum & Browne, 1993). As examples of reflective and formative indicators, Barki, Titah, and Boffo (2007) developed both formative and reflective indicators for their task-technology adaptation construct. As can be seen in the items in Table 44, the formative items are worded in such a way that they cause the construct, while the reflective items are functions of the task-technology adaptation construct (Diamantopoulos & Siguaw, 2006).

Formative task-technology adaptation items	Reflective task-technology adaptation items
Stem: How much effort (in time and energy) did you spend recommending or suggesting…	**Stem:** Overall, how much effort (in time and energy) did you spend so that…
Improvements to the system's functionalities.	Your system and your business processes fit each other?
Improvements to the system's interface.	Your system and your business processes would be in harmony with each other?
Improvements to the system's hardware.	
Modifications to your tasks so that they better fit the system.	
Modifications to the system so that it better fits your tasks.	
Table 44. Formative and reflective indicators for the same construct.	

Jarvis, MacKenzie, and Podsakoff (2003) provided guidelines that are useful in determining if a construct should be modeled as formative or reflective. According to these researchers, a construct should be modeled as formative if the following traits are true (Jarvis et al., 2003, p. 203):

- The indicators are viewed as the defining characteristics of the construct
- Changes in the indicators are expected to cause changes in the construct
- Changes in the construct are not expected to cause changes in the indicators
- The indicators do not necessarily share a common theme
- Eliminating an indicator may alter the conceptual domain of the construct
- A change in the value of one of the indicators is not necessarily expected to be associated with a change in all of the other indicators
- The indicators are not expected to have the same antecedents and consequences

Table 45 shows each construct and its relationship to the statements above. The decision that a construct is formative or reflective is based on judgment, an analysis of the conceptualization of the construct, a review of the indicators, and an analysis of how these constructs have been used in other works (where applicable).

Construct	Are the indicators viewed as the defining characteristics of the construct?	Do changes in the indicators cause changes in the construct?	Do changes in the construct cause changes in the indicators?	Do the indicators share a common theme?	Does eliminating an indicator alter the conceptual domain of the construct?	Is a change in one of the indicators associated with a change in all of the other indicators?	Do the indicators have the same antecedents and outcomes?	Scale Type
Interactivity	No	No	Yes	Yes	No	Yes	No	Reflective
Vividness	No	No	Yes	Yes	No	Yes	No	Reflective
Customizability	No	No	Yes	Yes	No	Yes	No	Reflective
Homophily	No	No	Yes	Yes	No	Yes	No	Reflective
Info type	No	No	Yes	Yes	No	Yes	No	Reflective
Relationalism	No	No	Yes	Yes	No	Yes	No	Reflective
Allocentrism	No	No	Yes	Yes	No	Yes	No	Reflective
Ideocentrism	No	No	Yes	Yes	No	Yes	No	Reflective
Multiplicity	No	No	Yes	Yes	No	Yes	No	Reflective
Uncertainty	No	No	Yes	Yes	No	Yes	No	Reflective
Info quality	No	No	Yes	Yes	No	Yes	No	Reflective
Accessibility	No	No	Yes	Yes	No	Yes	No	Reflective

Table 45. Decision rules for reflective vs. formative construct determination and results for this study's constructs.

5.7 Survey Process

As can be seen in Figure 29 the research model can be divided into two sections. Respondents will complete items for all study construct, but the analysis will proceed in pieces. The reason for this is to maximize the power of the hypothesis tests and because two different statistical technique are being used. This section details the reasoning for the different analyses and explains precisely how the data will be collected and how the method of collection informs the analyses.

5.7.1 Data Collection

The survey process is shown in Figure 32. The survey starts out with respondents reading their rights as a participant and agreeing to participate in the survey. After this respondents will complete the seeker scales. These are the introversion, extraversion, allocentism and ideocentrism items. Since these are considered to be traits and stable across time they can be measured separate from sources and tasks.

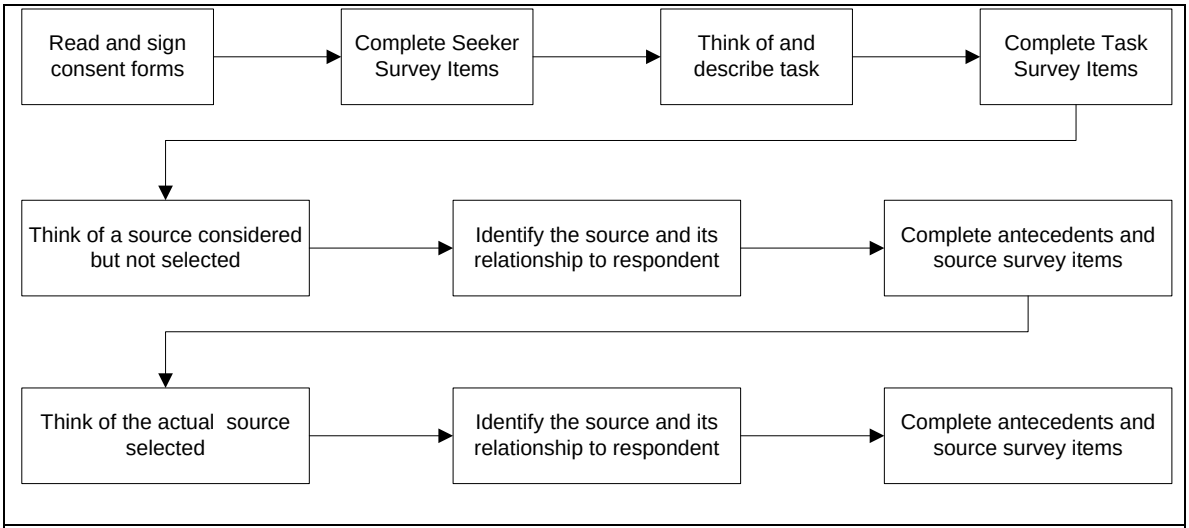


Figure 32. Process respondents go through for survey.

After completing the seeker items, respondents will be instructed to think of a task that required them to search for information. The exact instructions are shown on the survey instrument in Appendix C. Contained in the instructions are guidelines about the task type a respondent should consider. These guidelines are in accordance with how Campbell (1988) describes aspects of complex tasks in terms of multiplicity and uncertainty. Since according to complexity theory the actual task is secondary to the objective task characteristics, different tasks can be considered simultaneously. In essence what the individual is doing doesn't matter as much the fact that the task qualifies as multiplicitous or uncertain (or both). Collecting data in this manner will yield four groups of tasks that fall into the task complexity categories shown in Figure 23. Items to measure multiplicity and uncertainty are included on the survey to verify the task the respondent is thinking of falls into the proper quadrant.

Once a respondent has a task in mind they will then be asked to think of a source they considered selecting but ended up not selecting for this task. Once they think of this unused source respondents will report what the source is. Furthermore if the source is another individual, respondents will indicate their relationship to the source. With a task and unselected source in mind, the respondent will answer survey items for the relationalism antecedents and the source characteristics. Upon completion the respondent will then think of the source she did select and respond to the survey items for the relationalism antecedents and source characteristics.

This approach actually captures use which, as is argued in Chapter 2, is a slightly different concept than source selection. One of the limitations of the survey methodology is selection as it cannot be feasibly captured in the survey rather use is what has to be captured. As respondents are considering past information searching events the selection has already

been made. While use has to be captured in the survey, if similar findings result in both experiment and survey, then the argument will be made that relationalism applies to both selection and use. This concept will be further discussed in Chapter 9.

5.8 Analysis Plan

Figure 33 displays the overall data analysis plan for the survey portion of this project. The plan has three main parts. First the survey is prepared, then the data are collected, and lastly the data are analyzed. The following sections detail each step in this process.

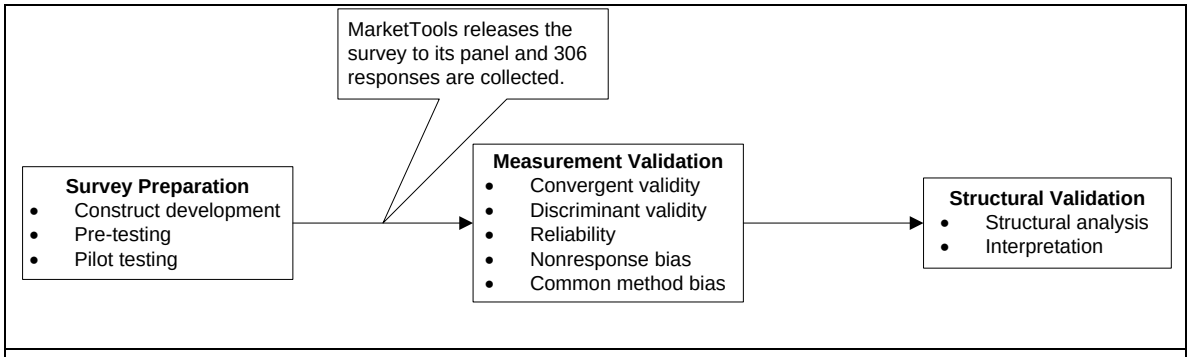


Figure 33. Data analysis plan.

5.8.1 Survey preparation

This portion of the process includes all analysis activities that occur prior to the main data collection. For this study, the scales for relationalism and customizability need to be developed. After development, all of the scales need to be tested for reliability and validity. The scales also need to be piloted to verify that the questions are understandable and that filling out the survey is not overly time consuming.

The development of the relationalism scale was carried out in three broad stages and follows from the process others have used to develop new scales (Moore & Benbasat, 1991). The first part of the scale development process will be to create the tentative items. Second, the

items will be q-sorted by knowledgeable experts, and finally, the instrument will be pilot tested and subjected to both exploratory and confirmatory factor analyses.

The last portion of the relationalism scale development will be to pilot test the entire research survey. A third sample will be collected, and these participants will complete all study constructs for three different types of information sources: books, other individuals, and websites. The purpose of this pilot test is to verify that the survey is not too lengthy for individuals to complete reasonably. Once all three survey preparation phases are complete, the process will shift to the middle box in Figure 33, and actual data collection can begin.

5.8.2 Measurement Validation

Once the data are collected, the measurement validation can begin. Structural equation modeling (SEM) will be used to test hypotheses 1 through 4, which allows researchers to specify the measurement model and ascertain its reliability and validity before proceeding to test the structural model (Anderson & Gerbing, 1988; Kline, 2005). For hypotheses 5 through 7 a variant of SEM, structured means models (SMM) will be used (Byrne, 2008; Byrne & Stewart, 2006). A SMM analysis is akin to ANOVA in that by adding a constant term to the structural model differences in the latent factor means can be determined and tested. More details about the appropriateness of each analysis technique will be provided when the results of each test are presented.

As part of specifying the measurement model, adequate convergent and divergent validity of the study constructs will be demonstrated. Both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) techniques will be used to accomplish this task. The reliability of the constructs will be demonstrated by calculating Cronbach's α, the average variance

extracted (AVE) for each construct, and the internal consistency reliability (ICR) for each construct.

In this phase, nonresponse bias and common method bias will also be addressed. Nonresponse bias occurs when a pattern among survey nonresponders exists. Nonresponse bias is difficult to detect; though, it is commonly argued that those who do not respond are less interested in the survey subject material (Blair & Zinkhan, 2006; Taris & Schreurs, 2007). While it is impossible to compare nonresponders to responders, the generally accepted method to investigate nonresponse bias is to compare early responders to late responders. Presumably, late responders are more like nonresponders than early responders (Armstrong & Overton, 1977). Therefore, our investigation of nonresponse bias will be to compare early and late responders.

Common method bias is the other form of bias addressed in validating the measurement model. Common method bias occurs when the instrument being used impacts the scores that are being gathered (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Common method bias is a problem because it is a source of measurement error, but fortunately, there are ways to minimize its effects. Podsakoff et al. (2003) recommend several ways to combat common method bias, two of which will be implemented in this research. First, multiple methods are used; this is part of the reason we are conducting both an experiment and a survey. Each method adds to the triangulation of individuals' source selection. Further, different scales to measure the constructs are being used. A mix of both Likert and semantic differential scales is being used. Furthermore, the Likert scales have different anchors. As participants complete the survey, their cognitive processing loads are increased when they have to change between Likert and semantic differential items and is further increased when the Likert anchors

change. This keeps participants from getting mentally lazy and just circling the same numbers over and over.

Portions of the survey are repetitive. An individual has to complete the same items for three different types of sources. Common method bias will be reduced by separating similar scales. So instead of filling out accessibility for all three sources at once, a participant will complete all of the scales while thinking of books, then he/she will begin anew while thinking of other individuals and then a third time while thinking of websites. Separating these scales in time reduces the likelihood that an individual will recall previous responses for the same items (Podsakoff et al., 2003).

Multiple methods and rigorous survey design and implementation are a set of techniques a researcher can use a priori to combat the effects of common method bias. Common method bias can also be reduced post hoc by choosing the right statistical analysis. By using structural equation modeling, the effects of common method bias can be statistically controlled by including an unmeasured latent methods factor. This technique is implemented by allowing items to load on their respective factors and loading them on a common factor (see Figure 34). This method provides two advantages to the researcher. First, the method factor that is causing the method effects does not need to be captured and measured, and second the effect of the method factor is modeled on the measures rather than on the latent constructs they represent (Podsakoff et al., 2003).

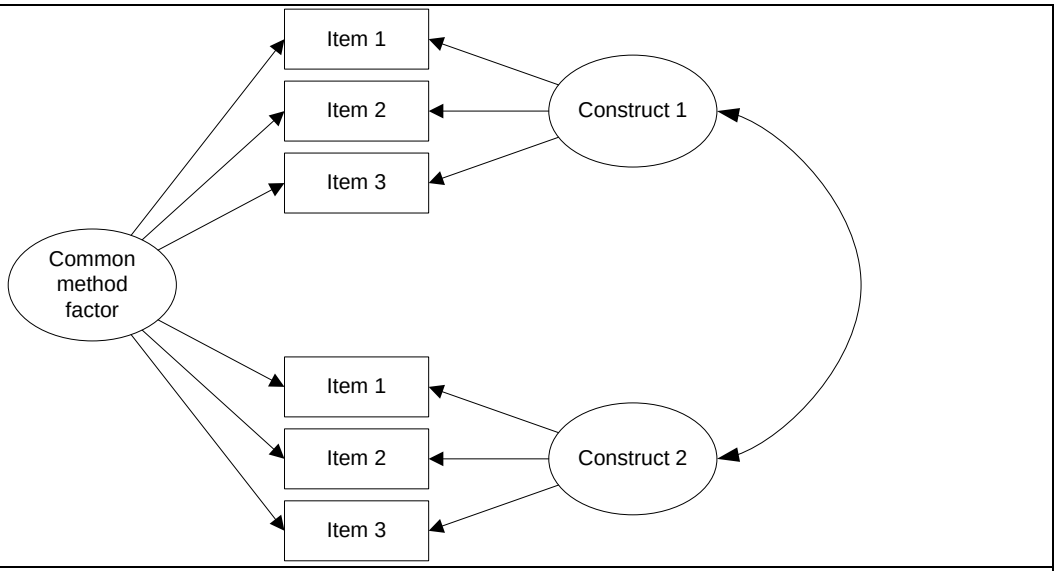


Figure 34. Measurement model with included common method factor.

5.8.3 Structural Validation

The hypotheses proposed in Chapter 3 are tested in this portion of the analysis plan. At this point, everything to ensure that our measures are reliable and valid will have been done. Validity threats and other biases that can cast doubt on the results will have also been addressed. Now, the structural model can be calculated, and its fit can be assessed via multiple methods. In addition, the path coefficients can be reported, the hypotheses can tested, and the results can be reported and interpreted.

5.9 Summary of Survey Methodology

This chapter laid out the data analysis plan for the survey portion of this project. The survey will be conducted in three basic discrete steps to ensure that the conclusions drawn can be attributed to the identified constructs and not to random chance or measurement artifacts. The next chapters will present the results of our findings: Chapter 6 will contain the results of the experiment, Chapter 7 will contain the survey preparation analyses, and Chapter 8 will contain the measurement and structural survey model results.

Chapter 6: Scale Development

This chapter develops the scales used in the experiment and survey. The development of the scales follows the guidelines laid out in other works (Churchill, 1979; Moore & Benbasat, 1991). As a general guideline whenever a previously developed and validated scale from the literature was available, it was used provided its items mapped to the way the construct is defined. In particular items for relationalism and customizability had to be developed, but all other scales were taken from the literature (see Table 30 for a listing of the scale sources).

The steps for scale development are:

1. Item generation
2. Statistical analysis of the scales, which includes
    a. Item purification
    b. Calculation of Cronbach's alpha
    c. Exploratory factor analysis
    d. Calculation of the average variance extracted
    e. Calculation of the internal composite reliability
    f. Confirmatory factor analysis
3. Calculation of the measurement model

Upon the completion of these analyses the scales will be shown to be reliable and valid and subsequently are suitable for use in the experiment and survey.

6.1 Item Generation

To articulate the basic construct a thorough review of the literature needs to be conducted. The review for this project crossed disciplines and the literature in psychology, marketing, HCI and communication as well as the MIS literature were reviewed. As a result of this review several related constructs were identified. These are habit, commitment, enjoyable interaction, personal connection, perceived usefulness and perceived ease of use. As part of the scale development process relationalism will be show to be distinct from all these constructs.

Once these related domains were identified, an initial item pool was created. The goal of this step is to systematically sample the entire content domain that is potentially relevant to the construct. This follows from Loevinger (1957, p. 659) who argues, "The items of the pool should be chosen so as to sample all possible contents which might compromise the putative trait according to all known alternative theories of the trait." This means the initial pool should be broader and more comprehensive than the theoretical view of the construct and the scale should initially contain content that will be shown to be tangentially related to the construct. The reasoning for this is simple—subsequent statistical testing can identify weak and unrelated items, but they cannot detect content that should have been included. Hence the goal is err on the side of overinclusiveness (L. A. Clark & Watson, 1995).

From these guidelines, 10 items to measure relationalism were developed. Relationalism is formally defined as *an individual's perception that she can form a relationship with a particular information source.* The initial items are shown in Table 46, and once these items were created second step of the scale development process commenced. The same process was used to generate the 10 customizability items shown in Table 47 as well. All the other scales were taken from the literature and therefore not shown here.

Item #	Item
Rel1 (I/A)	Using this source was like talking to another person
Rel2 (I/A)	This source was personable
Rel3 (I/A)	I felt like I was having a conversation when using this source
Rel4 (I/A)	I have a good relationship with this source
Rel5 (R/T)	This source was unresponsive to my needs
Rel6 (R/T)	This is a trustworthy source
Rel7 (R/T)	This is a sincere source
Rel8 (R/T)	I felt like this was a reasonable source
Rel9 (I/A)	I felt like this source listened to me
Rel10 (I/A)	I felt like this source liked me as a person
Relationalism: The perception that an individual can form a relationship with a source. Immediacy/Affection: Is the source conversational? Is the individual involved with the source? Receptivity/Trust: Are there expressions of rapport, openness and trust when interacting with the source?	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree	
Table 46. Likert scaled relationalism items.	

Item #	Item
Custom1	This source customizes its content to suit me
Custom2	This source can adapt its presentation to meet my needs
Custom3	The arrangement of this source is made especially for me
Custom4	This source can be tailored to fulfill my information requirements
Custom5	This source provides a variety of content that I can modify to achieve my goals
Custom6	This source is customizable
Custom7	This source is able to alter itself to provide me the information I need more easily
Custom8	This is a static source
Custom9	This source only presents itself in one way
Custom10	I cannot control the arrangement of this source
The ability for an individual to modify how a source presents its information to meet his/her needs (Kalyanaraman & Sundar, 2006; Kobsa et al., 2001).	
Scale range: 1=strongly disagree, 4=neutral, 7=strongly agree	
Table 47. Customizability items.	

6.2 Statistical Analyses

This section presents the results of the statistical analyses conducted to determine the reliability and validity of the scales used in the experiment and survey. All scales were rigorously analyzed in isolation as well as relative to each other including calculations of scale reliability, exploratory factor analyses and confirmatory factor analyses. Since a primary focus of this work is on the development of relationalism as a construct, additional analyses were conducted to show its discriminant validity. In particular data on theoretically similar constructs were collected and analyzed. Section 6.3.1 details the development of all the scales used while Section 6.3.2 details the comparison of the final relationalism items to these similar constructs. Finally, Section 6.3.3 presents combined analyses on all scales and the measurement model for the pretest data.

6.2.1 Development of Construct Measures

This section develops the final item set for all the study constructs. The antecedent constructs are developed first, followed by the task complexity scale, the personality and culture scales, and lastly the relationalism scale is developed.

6.2.1.1 Interactivity

As a construct, interactivity has been heavily researched in several academic disciplines. Since sources communicate their content to individuals, the definition of interactivity is rooted in how sources communicate their content. The interactivity scale contains 7 items, which are shown in Table 33. To develop and refine this scale, two samples were recruited, one of undergraduate business students and another of working professionals (N=864 and 334 respectively).

The reliability of the interactivity scale was acceptable. For the student sample the Cronbach's alpha was 0.79 while for the working professional sample the Cronbach's alpha was 0.80. Both these values are in excess of Nunnally's (1994) recommended guideline of 0.70.

A confirmatory factor analysis of each sample was also conducted. For the student sample the fit met accepted standards; the model χ^2_9=5.09, the NFI = 0.99, the CFI = 0.99, the SRMR = 0.01, and the RMSEA = 0.06 all indicating a valid scale. For the working professional sample the fit met accepted guidelines as well; the model χ^2_9=7.59, the NFI = 0.95, the CFI = 0.96, the SRMR = 0.03, and the RMSEA = 0.04 all indicating a valid scale.

6.3.1.2 Vividness

Vividness is the richness of a source and how it presents information to all the senses. To measure vividness a four item scale was taken from the literature (Steuer, 1992). The items are shown in Chapter 4 in Table 34. The same sample of undergraduates and business professionals also responded to the vividness items (N=864 and N=334 respectively).

The reliability of the vividness scale was acceptable. For the student sample the Cronbach's alpha was 0.88 while for the working professional sample the Cronbach's alpha was 0.86. Both these values are in excess of Nunnally's (1994) recommended guideline of 0.70.

A confirmatory factor analysis of each sample was also conducted. For the student sample the fit met accepted standards; the model χ^2_2=4.17, the NFI = 0.94, the CFI = 0.94, the SRMR = 0.03, and the RMSEA = 0.04 all indicating a valid scale. For the working professional sample the fit met accepted guidelines as well; the model χ^2_2=4.99, the NFI = 0.91, the CFI = 0.92, the SRMR = 0.05, and the RMSEA = 0.07 all indicating a valid scale.

6.3.1.3 Customizability

Customizability is the ability for an individual to modify a how a source presents its information to meet the needs of the individual (Kalyanaraman & Sundar, 2006; Kobsa et al., 2001). To measure this construct a 5 item scale was developed which is shown in Table 35. The same sample of undergraduates and business professionals also responded to the customizability items (N=864 and N=334 respectively).

The reliability of the customizability scale was acceptable. For the student sample the Cronbach's alpha was 0.86 while for the working professional sample the Cronbach's alpha was 0.87. Both these values are in excess of Nunnally's (1994) recommended guideline of 0.70.

A confirmatory factor analysis of each sample was also conducted. For the student sample the fit met accepted standards; the model χ^2_5=6.34, the NFI = 0.96, the CFI = 0.96, the SRMR = 0.03, and the RMSEA = 0.07 all indicating a valid scale. For the working professional sample the fit met accepted guidelines as well; the model χ^2_5=5.10, the NFI = 0.99, the CFI = 1.00, the SRMR = 0.02, and the RMSEA = 0.008 all indicating a valid scale.

6.3.1.4 Homophily

Homophily is the degree to which individuals in a dyad are congruent or similar in certain attributes (Lazerfeld & Merton, 1954). To measure homophily a 4 item scale was taken from the literature (J. McCroskey et al., 1975). These items are shown in Table 36. The same sample of undergraduates and business professionals also responded to the homophily items (N=864 and N=334 respectively).

The reliability of the homophily scale was acceptable. For the student sample the Cronbach's alpha was 0.88 while for the working professional sample the Cronbach's alpha was 0.83. Both these values are in excess of Nunnally's (1994) recommended guideline of 0.70.

A confirmatory factor analysis of each sample was also conducted. For the student sample the fit met accepted standards; the model χ^2_2=5.24, the NFI = 0.95, the CFI = 0.95, the SRMR = 0.06, and the RMSEA = 0.06 all indicating a valid scale. For the working professional sample the fit met accepted guidelines as well; the model χ^2_2=7.54, the NFI = 0.91, the CFI = 0.91, the SRMR = 0.05, and the RMSEA = 0.08 all indicating a valid scale.

6.3.1.5 Task Complexity (Multiplicity & Uncertainty)

Multiplicity refers to the number of details an individual must deal with in accomplishing a task with the more details meaning the greater the degree of complexity. Uncertainty refers to the inability to attribute causal relationships among task aspects; hence, the task requires judgment to complete. Each of these constructs is measured with three items which are shown in Table 27. The same sample of undergraduates and business professionals also responded to the multiplicity and uncertainty items (N=864 and N=334 respectively).

The reliability of the multiplicity scale was acceptable. For the student sample the Cronbach's alpha was 0.93 while for the working professional sample the Cronbach's alpha was 0.92. The reliability of the uncertainty scale was also acceptable. For the student sample the Cronbach's alpha was 0.82 while for the working professional sample the Cronbach's alpha was 0.79. All of these values are in excess of Nunnally's (1994) recommended guideline of 0.70.

A confirmatory factor analysis of each sample was also conducted. Both scales had to be analyzed simultaneously to have degrees of freedom available for the analyses since each scale had only 3 items. For the student sample the fit met accepted standards; the model χ^2_8=11.22, the NFI = 0.99, the CFI = 0.99, the SRMR = 0.01, and the RMSEA = 0.05 all indicating a valid scale. For the working professional sample the fit met accepted guidelines as well; the model

χ^2_8=13.07, the NFI = 0.98, the CFI = 0.98, the SRMR = 0.04, and the RMSEA = 0.05 all indicating a valid scale.

6.3.1.6 Introversion & Extroversion

Introverts are individuals concerned with their internal mental existence and typically avoid interpersonal contact while extraverts are the opposite—outgoing, gregarious and interested in forming interpersonal relationships (Hills & Argyle, 2001). Each of these constructs is measured with three items which are shown in Table 29. The same sample of undergraduates and business professionals also responded to the multiplicity and uncertainty items (N=864 and N=334 respectively).

The reliability of the introversion scale was acceptable. For the student sample the Cronbach's alpha was 0.77 while for the working professional sample the Cronbach's alpha was 0.74. The reliability of the extraversion scale was also acceptable. For the student sample the Cronbach's alpha was 0.87 while for the working professional sample the Cronbach's alpha was 0.80. All of these values are in excess of Nunnally's (1994) recommended guideline of 0.70.

A confirmatory factor analysis of each sample was also conducted. Both scales had to be analyzed simultaneously to have degrees of freedom available for the analyses since each scale had only 3 items. For the student sample the fit met accepted standards; the model χ^2_8=54.71, the NFI = 0.97, the CFI = 0.95, the SRMR = 0.05, and the RMSEA = 0.08 all indicating a valid scale. For the working professional sample the fit met accepted guidelines as well; the model χ^2_8=21.61, the NFI = 0.95, the CFI = 0.97, the SRMR = 0.05, and the RMSEA = 0.07 all indicating a valid scale.

6.3.1.7 Allocentrism & Ideocentrism

Allocentrists are individuals who tend to put the welfare of their social group ahead of their own desires while ideocentrists are the opposite (H. C. Triandis et al., 1985). Each of these constructs is measured with 4 items apiece (shown in Table 28). The same sample of undergraduates and business professionals also responded to the multiplicity and uncertainty items (N=864 and N=334 respectively).

The reliability of the allocentrism scale was acceptable. For the student sample the Cronbach's alpha was 0.87 while for the working professional sample the Cronbach's alpha was 0.77. The reliability of the ideocentrism scale was also acceptable. For the student sample the Cronbach's alpha was 0.83 while for the working professional sample the Cronbach's alpha was 0.84. All of these values are in excess of Nunnally's (1994) recommended guideline of 0.70.

A confirmatory factor analysis of each sample was also conducted. With 4 items per scale enough degrees of freedom were available to analyze each scale separately. When analyzing the allocentrism scale using the student sample, the fit met accepted standards; the model χ^2_2=1.46, the NFI = 0.99, the CFI = 1.00, the SRMR = 0.005, and the RMSEA = 0.00 all indicating a valid scale. Like the student sample, the working professional sample the fit met accepted guidelines as well; the model χ^2_2=11.43, the NFI = 0.98, the CFI = 0.98, the SRMR = 0.01, and the RMSEA = 0.07 all indicating a valid scale.

When analyzing the ideocentrism scale using the student sample, the fit met accepted standards; the model χ^2_2=5.24, the NFI = 0.95, the CFI = 0.95, the SRMR = 0.06, and the RMSEA = 0.06 all indicating a valid scale. Like the student sample, the working professional sample the fit met accepted guidelines as well; the model χ^2_2=5.12, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.03, and the RMSEA = 0.06 all indicating a valid scale.

6.3.1.8 Relationalism

Relationalism is the perception that an individual can form a relationship with an information source. Relationalism is a second order construct comprised of two lower order dimensions—affection and receptivity. Affection is related to how much the individual likes the source while receptivity is related to how the individual relates to the information content. Since relationalism is the core construct of this research it will be subjected to additional analyses to demonstrate its reliability and validity.

The original 10 relationalism items are shown in Table 21 with 6 items designed to measure the affection dimension and 4 items designed to measure the receptivity dimension. First an EFA was conducted to verify that the items were measuring two separate dimensions. This analysis will identify potentially bad items and will serve to verify that the scale is measuring two dimensions. Next a CFA will be conducted to purify the items to the final item set. Then the Cronbach's alpha will be calculated on the finalized items.

An EFA using maximum likelihood estimation with a nonorthogonal promax rotation was conducted on a sample of undergraduates (N=105). Since this scale was expected to produce two dimensions, these were specified a priori as opposed to using the Kaiser criterion which specifies a factor exists if its eigenvalue is greater than 1. The result of this analysis is shown in Table 48. As can be seen, most items loaded cleanly on their respective factor, though there was some cross loading evident with three of the items.

The next analysis conducted was a CFA using all 10 items. No items were dropped based on the EFA results though the three cross loading items merit special investigation during the CFA analyses. A CFA is a more rigorous test of the scale, and if the CFA results show these items are acceptable, they will remain in the scale regardless of the EFA results.

The results of the 10 item, 2 factor CFA indicate that the data did not fit the model. The model χ^2 was 172.76 on 33 degrees of freedom. The ratio of degrees of freedom to χ^2 was 5.23, which indicates a poor fit. Furthermore the NFI was 0.78, the CFI was 0.81, the SRMR was 0.08 and the RMSEA was 0.20. None of these fit indices are within acceptable limits. The loadings from this analysis are shown in Figure 35.

Based on the results of the EFA, the items that cross loaded were removed and another CFA was conducted using only 7 items. This resulted in an acceptable 2 factor scale. The fit was acceptable. The model χ^2 was 15.05 on 11 degrees of freedom. The ratio of degrees of freedom to χ^2 was 1.36, which indicates an excellent fit. Furthermore the NFI was 0.97, the CFI was 0.99, the SRMR was 0.03 and the RMSEA was 0.05. All of these fit indices are within acceptable limits. The loadings from this analysis are shown in Figure 36.

	affection	receptivity
Using this source was like talking to another person	**0.85**	0.19
This source was personable*	**0.69**	**0.42**
I felt like I was having a conversation when using this source	**0.91**	0.16
I have a good relationship with this source*	**0.61**	**0.46**
I felt like this source listened to me	**0.86**	0.21
I felt like this source liked me as a person	**0.86**	0.26
This source was unresponsive to my needs	0.00	**0.66**
This is a trustworthy source	0.34	**0.76**
This is a sincere source*	**0.48**	**0.66**
I felt like this was a reasonable source	0.33	**0.79**

Table 48. EFA results for 10 item relationalism pool.

With the final 7 item relationalism scale the Cronbach's alpha was calculated for each dimension of relationalism. For the 4 item affection dimension, the Cronbach's alpha was 0.90. For the 3 item receptivity dimension the Cronbach's alpha was 0.87. For the entire second order scale, the Cronbach's alpha was 0.86. All of these values are in excess of Nunnally's (1994)

recommended guideline of 0.70. The next section further analyzes the relationalism scale in relation to theoretically related constructs.

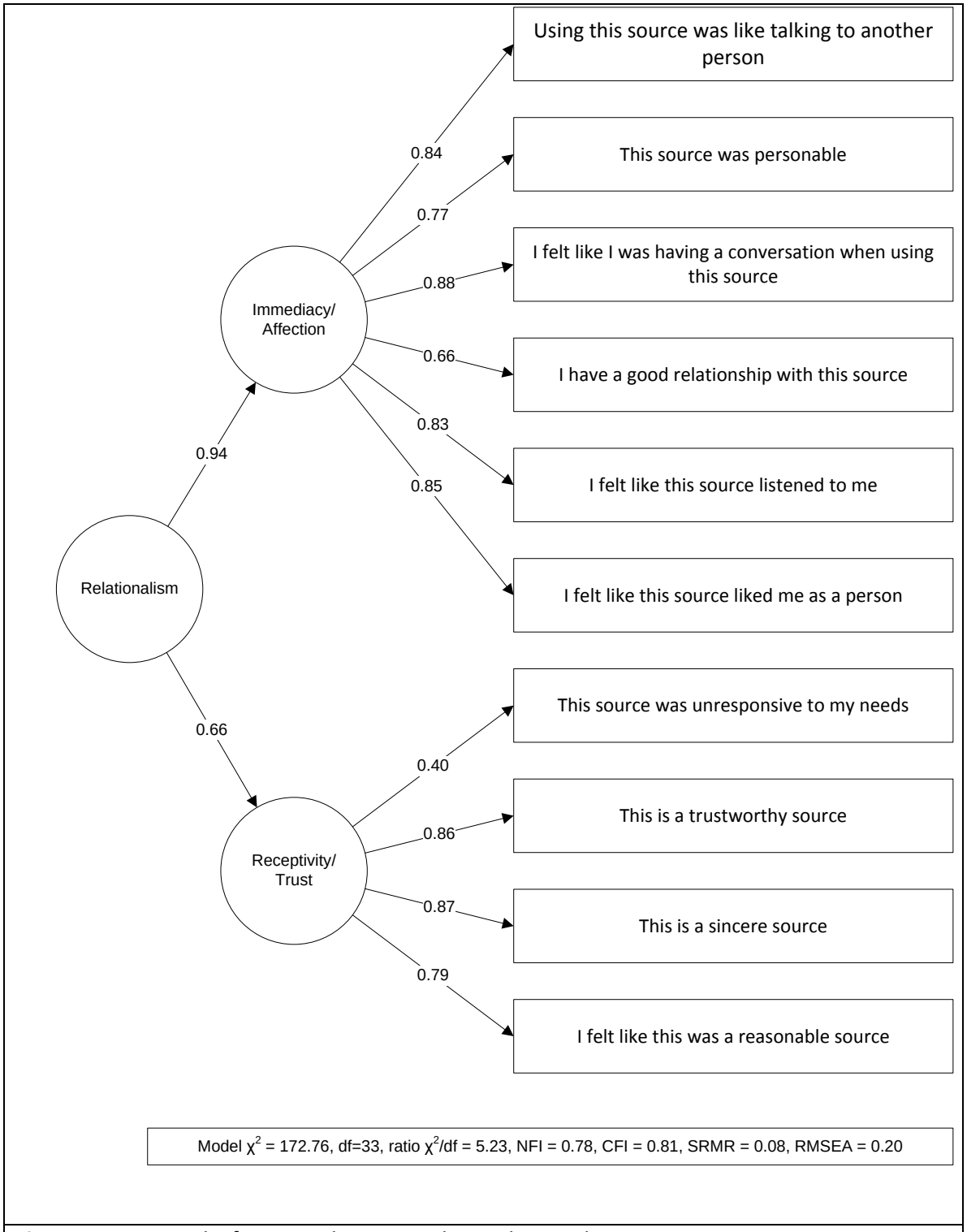


Figure 35. CFA results for original 10 item relationalism scale.

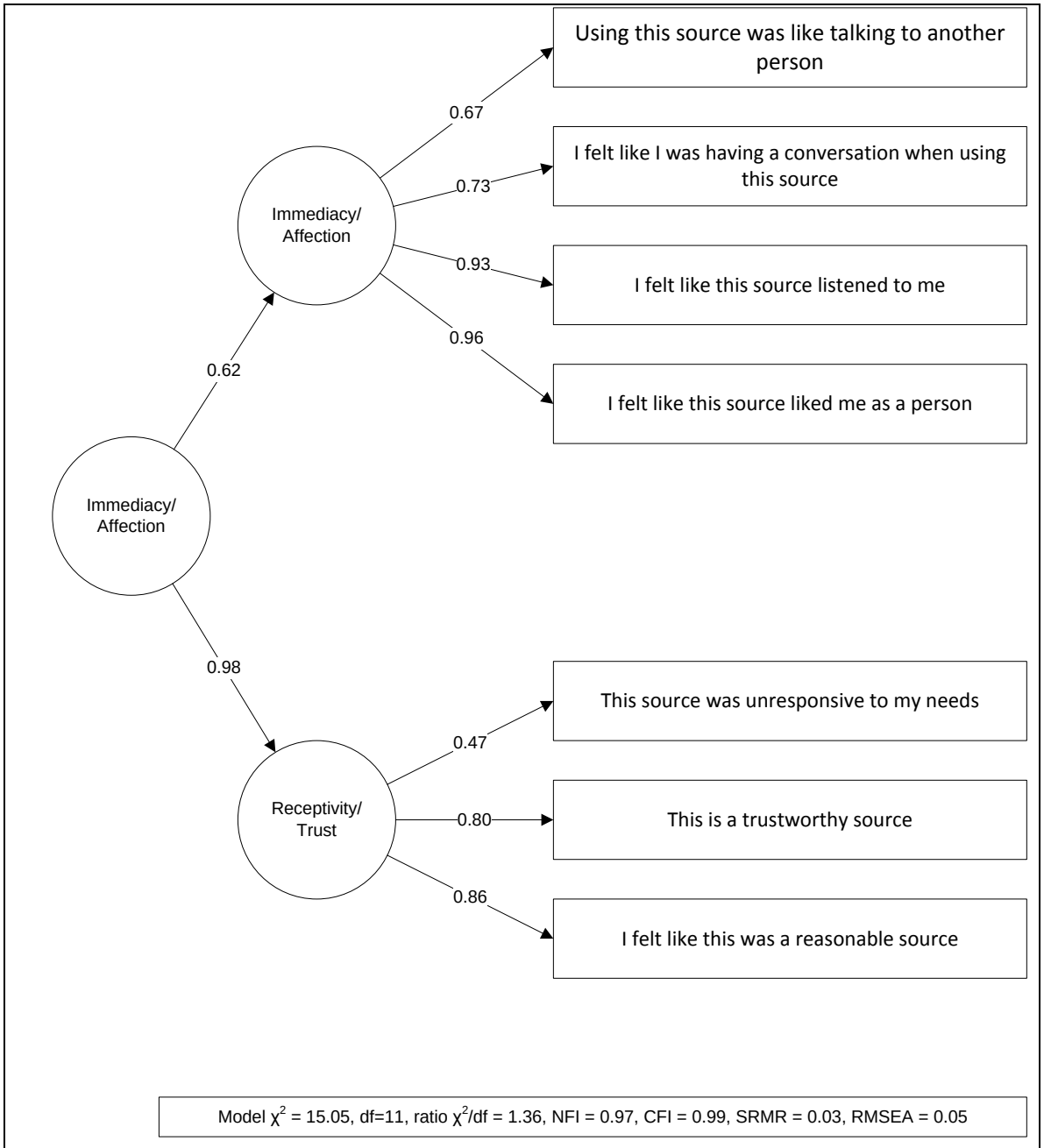


Figure 36. CFA results for reduced 7 item relationalism scale.

Enjoyable interaction Gremler & Gwinner (2000)

1. In thinking about my relationship with this source, I enjoy interacting with this source
2. This source creates a feeling of "warmth" in our relationship
3. This source relates well to me
4. In thinking about my relationship, I have a harmonious relationship with this source
5. This source has a good sense of humor
6. I am comfortable interacting with this source

Personal connection Gremler & Gwinner (2000)

1. I feel like there is a "bond" between this source and myself
2. I look forward to getting information from this source
3. I strongly care about this source
4. This source has taken a personal interest in me
5. I have a close relationship with this source

Habit Gefen (2003)

1. This is where I usually go for information
2. This is my preferred source of information
3. When I need information, I go to this source
4. I often get information from this source

Commitment Li et al. (2006)

1. I enjoy telling others about this information source
2. It is easy to become attached to this information source
3. This information source has a great deal of attraction for me
4. I am afraid I will miss something if I stop using this information source
5. To stop using this information source would require considerable personal sacrifice
6. Some aspects of my life would be affected if I stop using this information source

Perceived ease of use Davis (1989)

1. This source is easy to learn
2. This source is clear and understandable
3. This source is flexible
4. It is easy to become skillful with this source
5. This source is easy to use

Table 49. Items used to measure related comparison constructs.

6.3.2 Relationalism versus Similar Constructs

Discriminant validity is the degree to which the operationalization of a given construct is distinct from other operationalizations that it should theoretically be similar to. Based on a review of the psychology, communication, marketing and MIS literature several constructs that should be theoretically similar to relationalism were identified. Five different constructs were identified. These were two dimensions of rapport, habit, perceived ease of use, and commitment. Each construct is defined as it is compared to relationalism. The items used to

measure these comparison constructs are shown in Table 49. This section tests that relationalism is distinct from these other constructs.

6.3.2.1 Relationalism versus Rapport

Rapport is a multidimensional construct comprised of enjoyable interaction and personal connection. Enjoyable interaction is one of the dimensions of rapport and has been defined as a feeling of care and friendliness within a relationship while personal connection is the bond between the two parties in the dyad (Gremler & Gwinner, 2000). Rapport is measured by the 11 items shown in Table 49.

	affection	receptivity	3	4
relationalism	**0.87**	0.05	0.22	0.06
relationalism	**0.90**	0.17	0.19	0.27
relationalism	**0.89**	0.24	0.21	0.14
relationalism	**0.89**	0.15	0.29	0.00
relationalism	0.21	**0.87**	0.05	0.35
relationalism	0.18	**0.91**	0.06	0.23
relationalism	0.10	**0.90**	0.10	0.17
enjoyable	0.14	0.17	**0.68**	0.51
enjoyable	0.29	0.14	**0.43**	0.58
enjoyable	0.22	0.06	**0.34**	0.72
enjoyable	0.11	0.10	**0.51**	0.55
enjoyable	0.18	0.16	**0.78**	0.12
enjoyable	0.06	0.25	**0.17**	0.58
connection	0.12	0.13	0.62	**0.61**
connection	0.10	0.27	0.12	**0.81**
connection	-0.04	0.23	0.61	**0.64**
connection	0.10	0.11	0.84	**0.28**
connection	0.14	0.12	0.79	**0.44**

Table 50. EFA results comparing relationalism to rapport.

An EFA using a sample of undergraduate business students (N=105) using maximum likelihood estimation and a nonorthogonal promax rotation was used. Further since 4 factors were expected they were specified a priori. The results of the EFA indicate that relationalism is

indeed distinct from rapport. There was no evidence of any cross loading between relationalism and rapport as shown in Table 50. There was some evidence of cross loading within the rapport scale, but that is not of concern.

To further demonstrate that relationalism and rapport are distinct constructs a CFA was conducted where each dimension of relationalism was compared to rapport. This analysis is conducted in two steps. The first step all items are loaded on a single factor. In the second step all the items are loaded on their theoretical factor. Since these are nested models a chi square difference test can be conducted. If the chi square test is significant then the model with the lower chi square value is the more accurate model. The chi square test in CFA is a measure of misfit—the reason why lower values are preferable (Kline, 2005).

A model with the 11 rapport items and the affection relational items all loaded on one factor was run, and the model χ^2_{90}=489.25. Next a model where each construct was loaded on its own factor was run and its model χ^2_{87}=260.27. The difference χ^2_3=228.97 which is significant ($p<0.0001$) thereby indicating that rapport is distinct from the affection dimension of relationalism.

Next a model with the 11 rapport items and the receptivity relational items all loaded on one factor was run, and the model χ^2_{77}=506.28. Next a model where each construct was loaded on its own factor was run and its model χ^2_{74}=222.76. The difference χ^2_3=283.52 which is significant ($p<0.0001$) thereby indicating that rapport is distinct from the receptivity dimension of relationalism.

6.3.2.2 Relationalism versus Habit

Next an EFA using a sample of undergraduate business students (N=105) where relationalism and habit were entered together was conducted. According to the literature,

habits have the following characteristics: (1) habits require learning (Verplanken, Aarts, van Knippenberg, & Moonen, 1998); (2) habits are automatic responses to specific situations or stimuli, and are always limited in scope (Aarts, Verplanken, & van Knippenberg, 1998; Limayem & Hirt, 2003; Ouellette & Wood, 1998); (3) habits emerge from response repetition(Ouellette & Wood, 1998); (4) habitual responses are automatic in the sense that they can be performed quickly in parallel with other activities and with allocation of minimal attention (Ouellette & Wood, 1998); and (5) habits reflect automatic behavior tendencies developed during the past history of the individual (Limayem & Hirt, 2003; Ouellette & Wood, 1998). Since a relationship develops over time, using a source might be habitual instead of an individual willfully choosing to use a source high in relationalism.

An EFA using maximum likelihood estimation and a nonorthogonal promax rotation was used. Further since 3 factors were expected they were specified a priori. The results of the EFA indicate that relationalism is indeed distinct from habit. There was no evidence of any cross loading between relationalism and habit as shown in Table 51.

To further demonstrate that relationalism and habit are distinct constructs a CFA was conducted where each dimension of relationalism was compared to habit. This analysis is conducted in two steps. The first step all items are loaded on a single factor. In the second step all the items are loaded on their theoretical factor. Since these are nested models a chi square difference test can be conducted. If the chi square test is significant then the model with the lower chi square value is the more accurate model. The chi square test in CFA is a measure of misfit hence the reason why lower values are preferable (Kline, 2005).

A model with the 4 habit items and the affection relational items all loaded on one factor was run, and the model χ^2_{20}=408.57. Next a model where each construct was loaded on

its own factor was run and its model χ^2_{19}=55.05. The difference χ^2_1=353.52 which is significant (p<0.0001) thereby indicating that habit is distinct from the affection dimension of relationalism.

	affection	receptivity	habit
relationalism	**0.91**	0.06	0.14
relationalism	**0.93**	0.14	0.18
relationalism	**0.89**	0.21	0.22
relationalism	**0.91**	0.12	0.25
relationalism	0.21	**0.88**	0.26
relationalism	0.17	**0.88**	0.34
relationalism	0.06	**0.83**	0.39
habit1	0.26	0.33	**0.85**
habit2	0.29	0.24	**0.88**
habit3	0.26	0.32	**0.87**
habit4	0.12	0.38	**0.84**

Table 51. EFA results comparing relationalism to habit.

Next a model with the 4 habit items and the receptivity relational items all loaded on one factor was run, and the model χ^2_{14}=218.93. Next a model where each construct was loaded on its own factor was run and its model χ^2_{13}=24.45. The difference χ^2_1=194.48 which is significant (p<0.0001) thereby indicating that habit is distinct from the receptivity dimension of relationalism.

6.3.2.3 Relationalism versus Ease of Use

Next an EFA using a sample of undergraduate business students (N=105) where relationalism and ease of use were entered together was conducted. Ease of use is defined as how easily can an individual use a piece of technology and is a major determinant of actual use (Davis, 1989).

An EFA using maximum likelihood estimation and a nonorthogonal promax rotation was used. Further since 3 factors were expected they were specified a priori. The results of the EFA

indicate that relationalism is indeed distinct from ease of use. There was no evidence of any cross loading between relationalism and ease of use as shown in Table 52.

	affection	receptivity	EOU
relationalism	**0.91**	0.07	0.06
relationalism	**0.94**	0.14	0.09
relationalism	**0.91**	0.24	0.03
relationalism	**0.93**	0.15	0.10
relationalism	0.22	**0.87**	0.24
relationalism	0.20	**0.91**	0.25
relationalism	0.12	**0.87**	0.26
eou1	0.07	0.19	**0.82**
eou2	0.03	0.14	**0.75**
eou3	0.04	0.15	**0.56**
eou4	0.07	0.18	**0.81**
eou5	-0.02	0.17	**0.84**

Table 52. EFA results comparing relationalism to ease of use.

To further demonstrate that relationalism and ease of use are distinct constructs a CFA was conducted where each dimension of relationalism was compared to ease of use. This analysis is conducted in two steps. The first step all items are loaded on a single factor. In the second step all the items are loaded on their theoretical factor. Since these are nested models a chi square difference test can be conducted. If the chi square test is significant then the model with the lower chi square value is the more accurate model. The chi square test in CFA is a measure of misfit hence the reason why lower values are preferable (Kline, 2005).

A model with the 5 ease of use items and the affection relational items all loaded on one factor was run, and the model $\chi^2_{27}=229.18$. Next a model where each construct was loaded on its own factor was run and its model $\chi^2_{26}=60.94$. The difference $\chi^2_1=168.24$ which is significant ($p<0.0001$) thereby indicating that ease of use is distinct from the affection dimension of relationalism.

Next a model with the 5 ease of use items and the receptivity relational items all loaded on one factor was run, and the model $\chi^2_{20}=173.63$. Next a model where each construct was loaded on its own factor was run and its model $\chi^2_{19}=54.51$. The difference $\chi^2_{1}=119.12$ which is significant ($p<0.0001$) thereby indicating that ease of use is distinct from the receptivity dimension of relationalism.

6.3.2.4 Relationalism versus Commitment

Lastly an EFA using a sample of undergraduate business students (N=105) where relationalism and commitment were entered together was conducted. Commitment is defined as a force that binds an individual to a course of action (Meyer & Herscovitch, 2001). An individual experiences it as a mindset, or a frame of mind or psychological state that compels her toward a course of action (Li et al., 2006; Meyer & Herscovitch, 2001). It is different from habit in that habit has an aspect of mindlessness to it, and commitment is a willful action.

An EFA using maximum likelihood estimation and a nonorthogonal promax rotation was used. Further since 3 factors were expected they were specified a priori. The results of the EFA indicate that relationalism is indeed distinct from ease of use. There was no evidence of any cross loading between relationalism and commitment as shown in Table 53.

To further demonstrate that relationalism and commitment are distinct constructs a CFA was conducted where each dimension of relationalism was compared to ease of use. This analysis is conducted in two steps. The first step all items are loaded on a single factor. In the second step all the items are loaded on their theoretical factor. Since these are nested models a chi square difference test can be conducted. If the chi square test is significant then the model with the lower chi square value is the more accurate model. The chi square test in CFA is a measure of misfit hence the reason why lower values are preferable (Kline, 2005).

	affection	receptivity	commitment
relationalism	**0.88**	0.01	0.24
relationalism	**0.91**	0.12	0.14
relationalism	**0.90**	0.20	0.12
relationalism	**0.88**	0.09	0.25
relationalism	0.24	**0.88**	0.21
relationalism	0.19	**0.90**	0.21
relationalism	0.09	**0.88**	0.23
commit1	0.10	0.14	**0.79**
commit2	0.34	0.27	**0.82**
commit3	0.30	0.11	**0.85**
commit4	0.26	0.31	**0.25**
commit5	0.17	0.15	**0.21**
commit6	0.27	0.36	**0.29**

Table 53. EFA results comparing relationalism to commitment.

A model with the 6 commitment items and the affection relational items all loaded on one factor was run, and the model χ^2_{35}=360.72. Next a model where each construct was loaded on its own factor was run and its model χ^2_{34}=202.75. The difference χ^2_1=157.97 which is significant (p<0.0001) thereby indicating that ease of use is distinct from the affection dimension of relationalism.

Next a model with the 6 commitment items and the receptivity relational items all loaded on one factor was run, and the model χ^2_{27}=319.82. Next a model where each construct was loaded on its own factor was run and its model χ^2_{26}=173.90. The difference χ^2_1=145.92 which is significant (p<0.0001) thereby indicating that commitment is distinct from the receptivity dimension of relationalism.

6.3.2.5 Final Reliability and Validity Tests

To further demonstrate the uniqueness of the relationalism scale from its theoretically related constructs three measures of reliability were calculated. The internal composite reliability (ICR) was calculated on each construct. It is interpreted much like Cronbach's alpha,

which was also calculated. For the relationalism scale both the ICR and Cronbach's alpha indicate the scale is reliable with values about 0.70 indicating a reliable scale (Nunnally, 1994). The third reliability indicator calculated was the average variance extracted (AVE) which is shown on the diagonal in Table 54. Reliability is demonstrated if the AVEs on the diagonal exceed the off diagonal values, which is the case.

	alpha	ICR	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Relationalism: affection (1)	0.96	0.88	**0.94**						
Relationalism: receptivity (2)	0.95	0.85	0.37	**0.92**					
Commitment (3)	0.90	0.67	0.67	0.62	**0.82**				
Ease of use (4)	0.84	0.62	0.26	0.51	0.55	**0.79**			
Habit (5)	0.95	0.90	0.47	0.65	0.60	0.58	**0.95**		
Rapport: enjoyable (6)	0.89	0.86	0.57	0.56	0.74	0.52	0.49	**0.81**	
Rapport: connection (7)	0.89	0.82	0.78	0.53	0.78	0.44	0.55	0.76	**0.85**

Table 54. Reliability measures and correlations for relationalism and its theoretically related constructs.

The data presented in Table 54 can also be used to calculated the discriminant validity. If the result of dividing the latent construct correlation by the root of the reliabilities (see Equation 1) is less than 0.85, discriminant validity between the scales exists, and it can be argued that each scale is measuring different things (D. T. Campbell & Fiske, 1959b).

$$\frac{r_{xy}}{\sqrt{r_{xx}\ r_{yy}}} \qquad \textbf{Equation 1}$$

As can be seen in Table 55 the discriminant validity is below 0.85 therefore the relationalism scale can be assumed to be measuring a different construct than the other comparison scales.

This chapter developed the reliability and validity of the study construct scales that will be used in the experiment and the survey. Chapter 7 will present the results of the experiments

while Chapter 8 will present the results of the survey. Additional tests of the reliability and validity of these scales will be presented in those chapters as well.

Relationalism dimension	Related construct	Discriminant validity
affection	commitment	0.72
	ease of use	0.29
	habit	0.49
	enjoyable interaction	0.62
	personal connection	0.84
receptivity	commitment	0.67
	ease of use	0.57
	habit	0.68
	enjoyable interaction	0.61
	personal connection	0.58

Table 55. Discriminant validity for relationalism dimensions.

6.4 Summary of Scale Development

This chapter developed the scales that will be used in both the experiment and survey. Based on samples of both target populations, undergraduate students and working professionals, all study scales demonstrate acceptable reliability and validity across both samples.

Relationalism as the core construct of this work was subjected to additional analyses. Comprised of two theoretical dimensions, the analyses showed that the reduced 7 item relationalism scale clearly measured each dimension without cross loading on the other. Further the correlation between the two dimensions is 0.77. This has implications for how relationalism will be used in the subsequent analyses in Chapter 7 and 8.

Chapter 7 is going to present the results of the two experiments. In Experiment 1, the hypotheses will be tested via ANOVAs; while Experiment 2 will use a mixed logistic model to test its hypotheses. Neither of these statistical techniques supports higher order constructs so the

items are going to have to be combined in order to make a single relationalism variable. Since the correlation between the affection dimension and receptivity dimension is 0.77, this is high enough to justify combining all 7 items into a single relationalism item which will allow for the hypotheses to be tested (Spector, 1992).

Chapter 8 is going to present the survey results. In the survey structural equation modeling (SEM) techniques will be used to analyze the hypotheses. SEM does support higher order constructs hence relationalism will be modeled as shown in Figure 36.

Chapter 7: Experimental Results

This chapter will report the results of the two experiments. As discussed back in Chapter 4, two experiments will be conducted, the first to test the antecedents to relationalism, and the second to investigate relationalism's effect on source selection. This chapter is divided into the following major sections. Section 7.1 describes and reports the results of several rounds of pre and pilot testing. Section 7.2 provides the results of the first experiment which formally test Hypotheses 1 -4 that were presented back in Chapter 3. Section 7.3 provides the results for the second experiment which formally test Hypotheses 5-7 that were also presented back in Chapter 3.

7.1 Experimental Development, Pretesting & Pilot Testing

Before main data collection could begin, both experimental protocols were thoroughly pretested and pilot tested. Prestesting to verify that the antecedents were properly implemented was the first round conducted. The same set of websites was going to be used for both experiments, so this pretest was equally applicable to both experiments. The second round of pretesting involved determining how many websites a potential subject could meaningfully rate. Ideally one subject could rate all 8 websites thereby resulting in a complete block experimental design. The pretest directly impacts Experiment 1. The third round of pretesting involved verifying that the experimental tasks were properly perceived by potential subjects. This pretest directly impacts Experiment 2. Once the pretesting was completed, each experiment was piloted with 10 subjects for Experiment 1 and 8 subjects for Experiment 2 to verify that both protocols ran smoothly.

7.1.1 First Round of Pretesting

The first round of pretesting involved testing for mean differences in the ratings of the antecedents across the 8 websites, for this pretest a sample of 32 undergraduates was recruited. Each undergraduate rated the interactivity, vividness and customizability of one of the experimental websites. Each site was rated 4 times. Subjects were given tasks designed to highlight the interactivity, vividness and customizability features of the site. Tasks were based upon the construct definitions. For instance a sample task would be to try to communicate with the governor. In the high interactivity websites, this could be accomplished by email, chat or comments. In the low interactivity condition, the only way to communicate was via USPS as only the physical address of the governor's mansion was available on the site.

An ANOVA was conducted for interactivity, vividness and customizability. For interactivity, there were significant differences seen across the websites ($F_{(7,24)}$=25.20, MSE=0.80, $p < 0.0001$). Multiple comparisons revealed significant differences between the four high interactivity websites and the four low interactivity websites. For vividness, there were significant differences seen across websites ($F_{(7,24)}$=28.32, MSE=0.68, $p < 0.0001$). Multiple comparisons revealed significant differences between the four high vividness websites and the four low vividness websites. For customizability, there were significant differences seen across websites ($F_{(7,24)}$=36.65, MSE=0.58, $p < 0.0001$). Multiple comparisons revealed significant differences between the four high customizable websites and the four low customizable websites.

In debriefing subjects after this round of pretesting, a couple of changes to the experimental websites were made. Several subjects pointed out that a phone number for the governor was available in the low interactivity condition. The websites were updated and the

phone number was removed. Further many of the subjects in the customizability condition expressed a desire for additional color schemes for the website. The number of color schemes was doubled from 4 to 8.

7.1.2 Second Round of Pretesting

The goal of the second round of pretesting was to determine how many sites a subject could conceivably evaluate. In Experiment 1, subjects will view the experimental websites and evaluate them in terms of their interactivity, vividness, customizability, and homophily. Since the first three characteristics are design elements, that yields 8 websites. The advantage to using a single subject to evaluate all 8 websites is the resultant experimental design would be a complete block thereby allowing the researchers to investigate all main effects, 2-way and 3-way interactions. If subjects cannot meaningfully evaluate all 8 sites, then an incomplete block experimental design will have to be used which means some of the effects will be nonestimable since they will be confounded within blocks (Hinkelmann & Kempthorne, 2008).

A sample of 10 subjects was recruited and these subjects went through the process of experiment 1, rating all 8 websites. During the debriefing session these subjects were asked for their thoughts about how it was to rate 8 websites all with the same content. Eight of the 10 subjects expressed comments such as, “I thought this experiment would never end” or “I felt like I was looking at the same thing over and over, I’m not too sure how good my ratings will be on some of those last sites.” Only 2 thought they could meaningfully evaluate all 8 sites. In response to these findings, Experiment 1 will be conducted as an incomplete block. All 10 subjects said they could meaningfully evaluate 4 websites, 9 said they could evaluate 5 sites, 5 said they could evaluate 6 sites.

Based on these results, the experiment will be conducted as a 2^3 factorial in blocks of 4.

7.1.3 Third Round of Pretesting

The third round of pretesting was conducted to verify that the experimental task manipulations had the desired effect. Task complexity is comprised of both multiplicity and uncertainty and it is important to verify that the tasks subjects are given in Experiment 2 are perceived correctly. A sample of 44 subjects was recruited and they rated the experimental tasks in terms of the perceived uncertainty and multiplicity of each task. Subjects were presented tasks in one of 4 orders so potential order effects could be analyzed.

With respect to multiplicity, significant differences were seen between the tasks ($F_{(3, 227)}$=22.30, MSE=2.16, p<0.0001). Multiple comparisons reveal that the two high multiplicity tasks had the highest means and both were significantly higher than both low multiplicity means. An additional difference in multiplicity was seen between the two low multiplicity tasks. This was not judged to be problematic since both these means were significantly lower than the high multiplicity tasks.

With respect to uncertainty, significant differences were seen between the tasks ($F_{(3, 228)}$=7.88, MSE=2.89, p=0.0005). Multiple comparisons reveal that the two high uncertainty tasks had the highest means and both were significantly higher than both low uncertainty means.

With respect to order effects, these were not significant ($F_{(3,227)}$=1.49, MSE=2.37, p=0.22). This analysis reveals that the tasks were being correctly perceived regardless as to the order in which subjects were exposed to them. Based on the results of these three rounds of pretesting, it was determined that the experiments were ready to be pilot tested.

7.1.4 Experimental Pilot Testing

The final step before actual experimental data could begin was to pilot test both experiments. For pilot testing a handful of subjects were invited to participate. Their task was to

go through the experiment, but they received additional instructions to point out anything that wasn't immediately clear. The experimenter was available to answer questions.

For Experiment 1, 10 pilot testers were recruited, 5 going through each block. No subject reported any problems with the websites. Their reaction to the design was as expected. Pilot testers uniformly liked the high relationalism sites much better than the low relationalism sites. During debriefing, one pilot tester in particular was aware of the impact the sites had upon her feelings toward the site commenting, "I can't believe how much more I like the site and am willing to believe its content just because I can change the color scheme." Based on the verbal results and the fact pilot testers did not identify anything out of the ordinary about the sites, Experiment 1 was judged to be ready for main data collection.

Due to the small sample size, statistical analyses for this pilot study would not be very useful. The goal of this pilot was to verify that the procedures worked smoothly and that subjects would not have any undue problems completing the experiment. In this regard, the pilot was successful. None of these pilot subjects were allowed to participate in the experiment nor is the data collected from the pilot included in analyses presented later in this chapter.

For Experiment 2, 8 pilot testers were recruited and all 10 went through the entire process for Experiment 2 with the overall goal being to verify the experiment was ready for main data collection. Again a think aloud protocol was used and the experimenter was nearby to answer questions. Subjects in the more complex task conditions were relieved when they found out they did not have to actually work on the experimental task, but until they were told the experiment was over, subjects truly believed they were going to have to attempt to use the site they selected to accomplish the task. Based on the feedback from the pilot testers, Experiment 2 was judged to be ready for main data collection.

Much like the pilot test for Experiment 1, the small sample size precludes conducting statistical analyses. In terms of finding potential problems, this pilot was successful. Similar to the Experiment 1 pilot test, none of these pilot subjects were allowed to participate in the experiment nor is the data collected from the pilot included in analyses presented later in this chapter.

7.2 Experiment 1 Results

The first experiment investigates the relationship between the antecedents and relationalism. The antecedents under investigation are interactivity, vividness, customizability and homophily. The first three antecedents are design elements and were manipulated via the design of the experimental websites. Homophily was manipulated by targeting potential subjects that identified themselves as either conservative or liberal.

A sample of 110 subjects was recruited from political organizations (College Republicans and College Democrats) and from upper division political sciences courses at a small liberal arts school in the Northeastern United States to participate in the experiment. All subjects were compensated 10 dollars in exchange for their participation. The experiment took approximately 30 minutes for a subject to complete.

The general process subjects underwent in the experiment was to complete several political questions about the strength of their political beliefs, and then the experiment formally began. Subjects viewed one of the websites, then answered several survey items about the website, then played a simple video game to make certain their short term memory was cleared. Answering the survey items took about 3 minutes, and 1 round of the game took another 2 minutes. Subjects repeated the process (view, survey, game) for the remaining 3 websites except that after the final website subjects did not play the game.

7.2.1 Manipulation Check

As a manipulation check most of the survey items subjects completed after viewing a website was for the experimentally manipulated constructs. This check verifies that the subjects properly perceived the experimental manipulations. There were significant differences across the experimental website for interactivity ($F_{(7, 802)}$=27.17, MSE=1.32, p<0.0001), vividness ($F_{(7, 802)}$=49.94, MSE=1.44, p<0.0001) and customizability ($F_{(7,802)}$=53.10, MSE=1.44, p<0.0001). Multiple comparisons revealed significant differences between the four high interactivity sites versus the 4 low interactivity sites though the mean difference between the hihilo[10] site and the lohihi site was only 0.10. Multiple comparisons for vividness revealed significant differences between most of the high vividness sites versus the low vividness sites. There was not a difference between the lohilo site and the hilohi site in terms of the rated vividness. Multiple comparisons for customizability showed significant differences among most of the high customizability sites relative to the low customizability sites. There was no difference between the hihilo and the lolohi site in terms of customizability. Based on these manipulation checks, it was deemed that the manipulations were perceived largely as anticipated though these results do suggest interactions might exist.

7.2.2 Hypothesis Tests

To test the antecedent hypotheses a series of ANOVAs were conducted where the IVs are the experimentally manipulated constructs as well as political identity which was used to measure homophily. The results of a post hoc test for homophily using the scale items from Table 36 are also reported.

[10] Sites are rated in terms of their interactivity, vividness and customizability respectively; hence the lololo site signifies low interactivity, low vividness and low customizability.

To formally test the hypotheses for Experiment 1, an ANOVA will be used to analyze the data. The relationalism items shown in Table 37 were averaged to create a relationalism score. To test the first 3 hypotheses the data were collected in two blocks of four in the manner described in Section 7.1.2. Due to the confounding treatments within blocks, the mean square error is not used for the denominator of this test. Instead the denominator is the mean square for the block x interactivity x vividness x customizability term. The overall ANOVA was significant ($F_{(7, 802)}$=46.83, MSE=0.77, p<0.0001). Because the overall ANOVA was significant, it is appropriate to test the individual effects using the proper denominator for Hypotheses 1-3.

Hypothesis 1 states that a positive relationship is expected between interactivity and relationalism. To test this hypothesis an ANOVA was conducted. The results of this test were not significant ($F_{(1,3)}$=5.78, MS=2.08, p=0.09). Based on this result Hypothesis 1 is not supported. The mean for relationalism across the high interactivity sites was 4.05 (SD=1.03) while the mean for relationalism across the low interactivity sites was 3.81 (SD=1.02).

Hypothesis 2 states that a positive relationship is expected between vividness and relationalism. To test this hypothesis an ANOVA was conducted. The results of this test were significant ($F_{(1,3)}$=35.80, MS=2.08, p=0.009). Based on this result Hypothesis 2 is supported. The mean for relationalism across the high vividness sites was 4.23 (SD=0.95) while the mean for relationalism across the low vividness sites was 3.63 (SD=1.02).

Hypothesis 3 states that a positive relationship is expected between customizability and relationalism. To test this hypothesis an ANOVA was conducted. The results of this test were significant ($F_{(1,3)}$=66.21, MS=2.08, p=0.004). Based on this result Hypothesis 3 is supported. The mean for relationalism across the high vividness sites was 4.35 (SD=0.90) while the mean for relationalism across the low vividness sites was 3.53 (SD=0.99).

Hypothesis 4 states that a positive relationship is expected between homophily and relationalism. Homophily was measured by asking subject to identify themselves as very conservative, conservative, moderate, liberal or very liberal. In the analysis process these 5 groups were reduced to conservative, moderate and liberal to have approximately equal numbers in each condition. To test this hypothesis an ANOVA was conducted. The results of this test were not significant ($F_{(2,803)}$=0.09, MSE=0.77, p = 0.92). Based on this result Hypothesis 4 is not supported. These results are not surprising given the means for relationalism were 3.96 (SD=1.08), 3.94 (SD=1.10) and 3.91 (SD=0.97) for conservatives, moderates and liberals respectively.

As a post hoc test the homophily scale was added as a covariate instead of political identity. The homophily score was based on the average of the homophily items shown in Table 36. When this measure of homophily was used, it did exhibit a significant positive relationship with relationalism ($F_{(1, 808)}$=539.11, MSE=0.64, p<0.0001). Possible explanations for this finding as well as the implications from this experiment will be discussed in Chapter 9.

7.3 Experiment 2 Results

The second experiment investigates the relationship between relationalism and source selection and the effects of the hypothesized moderators. In this experiment subjects were exposed to five different websites and then given a task that varied along two complexity dimensions. Subjects were asked to select a source to use to accomplish that task. Their choice was recorded and the experiment ended.

A sample of 156 undergraduate college students was recruited from a small liberal arts school in the Northeastern United States. None of these subjects were among the experiment 1 subjects. These subjects were recruited from undergraduate business classes. All subjects were

compensated 10 dollars in exchange for their participation. The experiment took approximately 30 minutes for a subject to complete.

The general process subjects went through in this experiment was to first answer items designed to measure the personality and culture constructs. Then subjects viewed one of the experimental websites, and then rated it in terms of relationalism. They repeated this for 4 more websites. Then subjects were given a task, asked to rate the task in terms of multiplicity and uncertainty, and then they selected the website they thought was most appropriate to accomplish the task. To avoid any carryover effects on selection, subjects were presented with only a single task.

7.3.1 Manipulation Check

Two sets of manipulation checks were conducted for this experiment. First manipulation checks for the design qualities of the websites were conducted. The second set of manipulation checks were to verify whether or not subjects properly perceived the complexity of the experimental task they were given.

Only 5 websites were used in Experiment 2. The decision for 5 websites was made for two reasons. First, subjects had to evaluate the websites, and pretesting clearly demonstrated that having a single individual rate all 8 sites was too demanding a cognitive task (see Section 7.1.2 for more details). Second, when presented with more choices, individuals can feel overwhelmed and simply refuse to make a choice (Dar-Nimrod, Rawn, Lehman, & Schwartz, 2009; Schwartz et al., 2002). By using 5 sources, the highest (hihihi) and lowest (lololo) relationalism sites as well as each design element in isolation can be studied.

Subjects rated the 5 experimental websites in terms of interactivity, vividness and customizability. For interactivity, significant differences were seen across the websites

($F_{(4,775)}$=124.07, MSE=1.71, $p < 0.0001$). Likewise for vividness, significant differences were seen across the websites ($F_{(4,775)}$=109.65, MSE=1.60, $p < 0.0001$). Lastly for customizability, significant differences were seen across the websites ($F_{(4, 799)}$=88.30, MSE=1.64, $p < 0.0001$). Multiple comparisons for interactivity showed the means for the two high interactivity sites (hihihi and hilolo[10]) were significantly greater than the means for the other three sites. A similar pattern was also observed for vividness and customizability with the high levels of the construct in question having a significantly higher mean than the low implementations. Based on these results it was determined that subjects properly perceived the site manipulations and should be able to accurately perceive the relationalism of the different sources.

The second manipulation check is to verify subjects correctly perceived the task requirements. Task complexity is theorized to fall along two dimensions—multiplicity and uncertainty. Four tasks were developed to highlight various aspects of complexity[11]. For multiplicity, significant differences were seen across the groups ($F_{(3, 152)}$=105.94, MSE=1.08, $p < 0.0001$), and for uncertainty significant differences were also seen as well ($F_{(3, 152)}$=62.71, MSE=1.29, $p < 0.0001$). Multiple comparisons for multiplicity showed the differences were between the high and low multiplicity conditions with no differences within conditions. For uncertainty, the high uncertain conditions had the highest means, and both were significantly higher than the low uncertainty condition, though there was a difference in uncertainty between the low uncertainty conditions. Based on these results it was determined that subjects properly perceived the task requirements.

[11] For a review of these tasks, the reader is directed to Table 25.

7.3.2 Hypothesis Tests

The hypotheses will be analyzed using a multi-level logistic model. In the following analyses, the site is nested in subject (each subject provides choice information about the 5 sites). By analyzing the data in this manner site preferences can be identified and the interaction effects of task and personality can be tested.

Hypothesis 5 states that there will be a positive relationship between relationalism and selection. Since the target websites vary relationalism based on certain antecedents, selection can only vary on relationalism. Hypothesis 5 is expected to be positive and can be considered a baseline hypothesis and trivial outside the context of a task. A sample of 156 undergraduate students was recruited and rated the relationalism of 5 different websites. As expected the effect of relationalism on selection was significant ($F_{(1,623)}$=24.17, $p < 0.0001$). The logit equation for this analysis is 3.51+0.49(rel). The logit is the linear representation of the logistic model and is not very useful in seeing how relationalism impacts selection. To convert to a meaningful representation predicted values are generated and then exponentiated using Equation 2. The result of calculating predicted logits and then exponentiating them via Equation 2 is shown in graphical form in Figure 37.

$$p = \frac{e^{logit}}{(1 + e^{logit})} \qquad \textbf{Equation 2}$$

As can be seen in Figure 37 the probability of use for low relationalism sources is very low, while sources with high relationalism are much more likely to be used. The baseline Hypothesis 5 is supported.

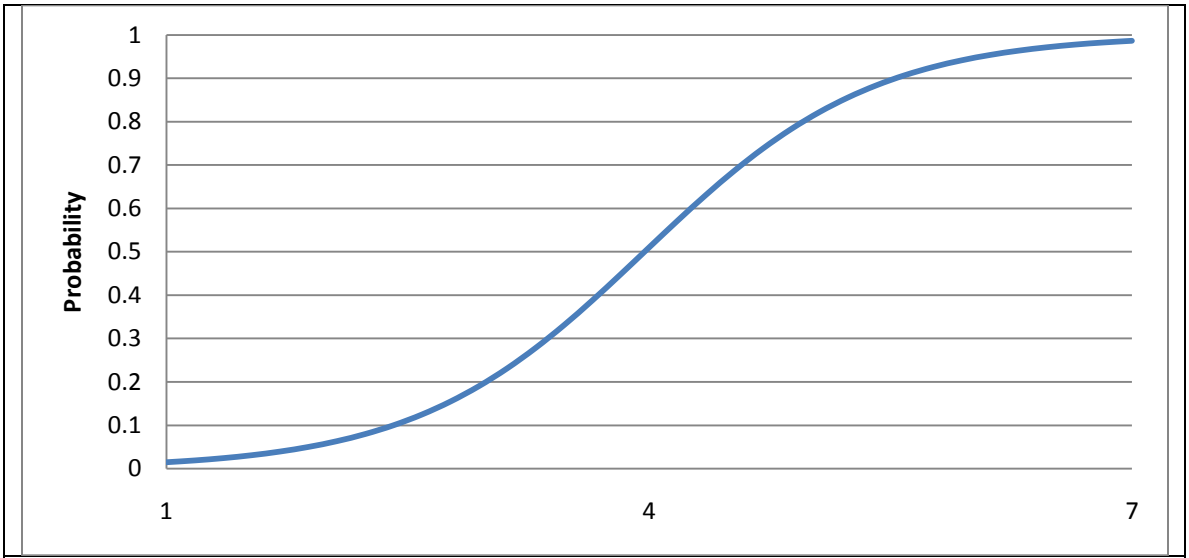


Figure 37. Plot of the probability of use as a function of increasing relationalism.

Expanding upon the baseline relationship in Hypothesis 5, Hypothesis 6 considers the impact of the task upon the baseline relationship. Specifically Hypothesis 6 states that task complexity will positively moderate the relationship between relationalism and selection. In particular Hypothesis 6a states multiplicity will positively moderate the relationship between relationalism and selection. A multi-level logistic model was used to analyze this hypothesis, and the moderation effects were significant ($F_{(4,612)}$=4.04, p=0.0031). Hypothesis 6b states multiplicity will positively moderate the relationship between relationalism and uncertainty. The multi-level logistic model also showed this interaction to be significant as well ($F_{(4,612)}$=2.95, p=0.0195).

To further investigate the exact nature of the interaction between multiplicity and relationalism, the data was subdivided into two groups based on whether a subject was given a high or low multiplicity task. In Chapter 3 it was argued that when faced with a complex task due to either multiplicity or uncertainty the relationship between relationalism and selection would be stronger. In comparing high and low multiplicity tasks, the preference is stronger for higher

relationalism sources (β_{hi}=0.65 vs. β_{lo}=0.34). The same pattern is seen is seen when comparing the high and low uncertainty conditions as well (β_{hi}=0.60 vs. β_{lo}=0.39).

Since there were four complexity conditions, one with no aspects of complexity, one emphasizing multiplicity, one emphasizing uncertainty, and the last emphasizing both multiplicity and uncertainty the plot of all on a single graph shows how the preference for relationalism is much stronger when the task has more elements of complexity in it. As can be seen in Figure 38 the probability of selecting a low relationalism source for a very complex task is much less than the probability of choosing a low relationalism source for a simple task. At the other end of the spectrum the converse is true. High relationalism sources are more likely to be selected for more complex tasks. Hypotheses 6a and 6b are supported.

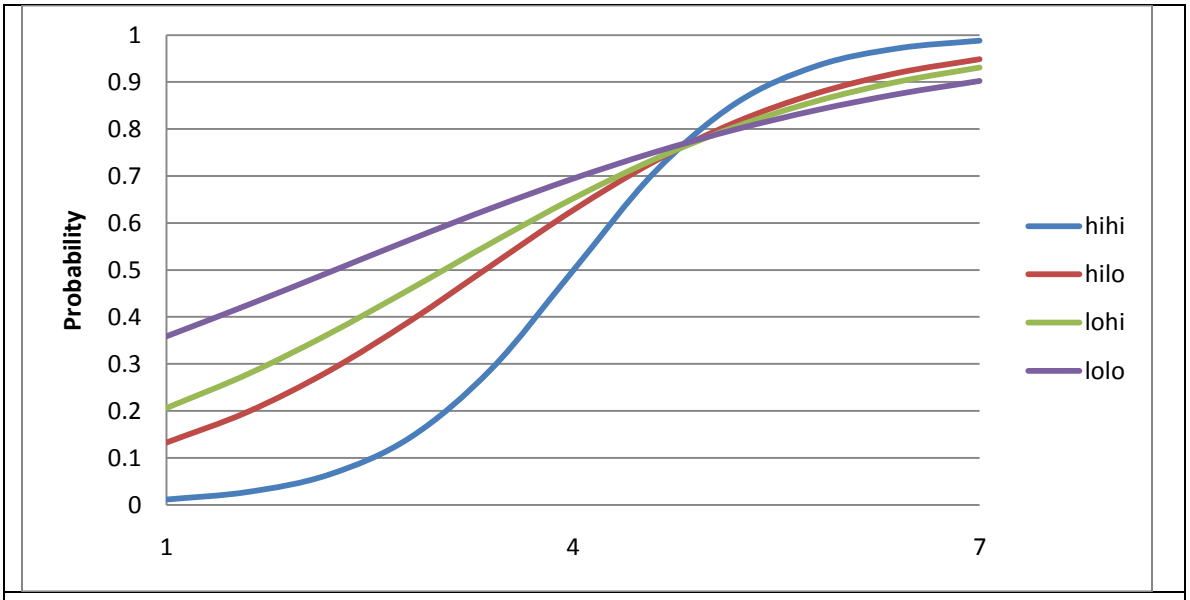


Figure 38. Plot of probability of use as a function of task condition and relationalism.

Hypothesis 7 investigates the effects of personality and culture on the relationship between relationalism and selection. Hypotheses 7a and 7b investigate the opposite effects of introversion and extraversion while Hypotheses 7c and 7d investigate the opposite effects of allocentrism and ideocentrism.

Hypothesis 7a argues that since extraverts are more likely to seek out interpersonal interaction, then being an extravert would strengthen the relationship between relationalism and selection. However when this interaction effect was tested, it was not significant ($F_{1,622)}$=1.73, p=0.1895). Hence Hypothesis 7a is not supported.

Hypothesis 7b argues that introverts shun interpersonal interaction; therefore, they would avoid high relationalism sources thereby weakening the relationship between relationalism and selection. However when this interaction was tested, it was significant ($F_{1,622)}$=11.26, p=0.0008). To better understand the exact nature of the interaction the simple slopes were calculated since both relationalism and introversion were continuous variables. In actuality, the interaction between relationalism and introversion is a curved response surface shown in Figure 39.

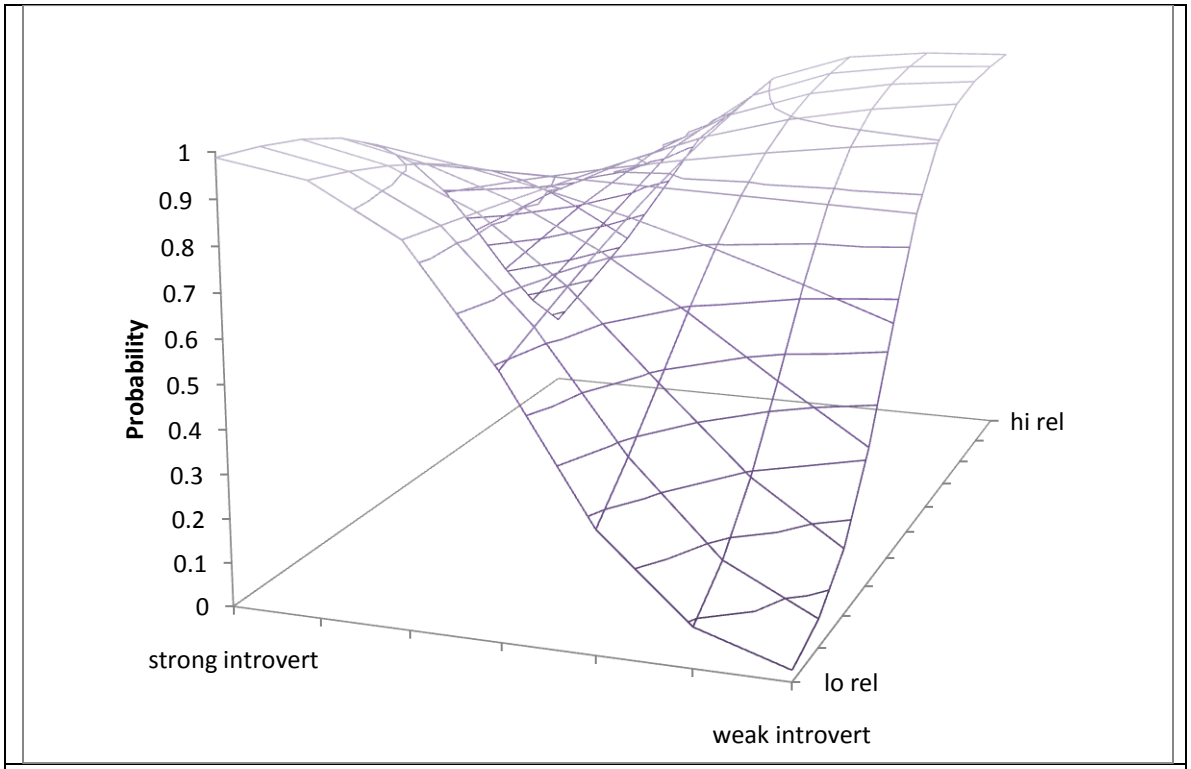


Figure 39. Response surface for relationalism x introversion interaction.

Calculating the simple slopes entails slicing across the three dimensional response surface and gives a snapshot of how the relationship between relationalism and selection depends on the level of introversion an individual has. Typically three simple slopes are calculated, one for high medium and low levels of the construct under investigation. Since this study is primarily interested in the relationship between relationalism and selection, three curves will be plotted. These curves correspond to the probability of selecting a source when an individual is a strong introvert, an introvert and a weak introvert. Taking into account that introverts avoid interpersonal interactions, it is expected that the relationship between relationalism and selection would be negative, and this is indeed the case.

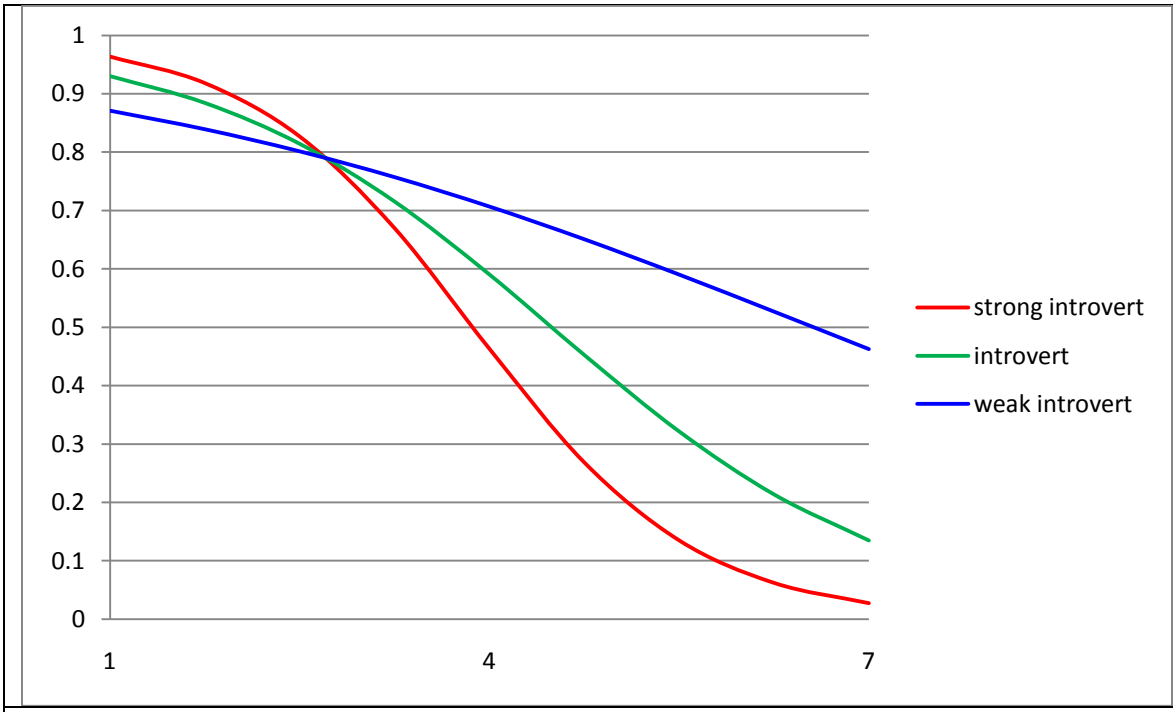


Figure 40. Simple slopes showing probability of selection based on amount of relationalism for three levels of introversion.

Looking at the simple slopes in Figure 40 introverts are more likely to have a higher probability of selecting lower relationalism sources, but as a source increases in relationalism, the probability diminishes less for weak introverts as opposed to introverts and strong

introverts. A strong introvert corresponds to an introversion score 1 standard deviation above the mean, an introvert is a mean introversion score, and a weak introvert corresponds to an introversion score 1 standard deviation below the mean. From this Hypothesis 7b is supported.

Hypothesis 7c states that allocentrism will positively moderate the relationship between relationalism and selection. This moderation is expected because allocentrics are concerned about the prevailing social norms of their reference group thereby making it more likely that when information is required they will want to have a relationship with the source. However, when the relationalism allocentrism interaction was tested, it was not significant ($F_{(1,622)}$=3.03, p=0.08); thus, Hypothesis 7c is not supported.

Hypothesis 7d states that ideocentrism will negatively moderate the relationship between relationalism and selection. This moderation is expected because ideocentrics are individualist and are less concerned with referent group norms making it more likely when information is required that they will seek out sources that do not convey relationship aspects. When the interaction between relationalism and ideocentrism was tested, it was not significant ($F_{(1,622)}$=0.04, p=0.85); thus, Hypothesis 7d is not supported.

7.4 Experimental Analyses Summary

This chapter presented the results of two experiments. The first experiment tested the antecedents to relationalism using a sample of 110 politically minded undergraduate subjects. The second experiment tested the relationship between relationalism and selection and the moderating effects of task and seeker characteristics using 156 undergraduate subjects.

In Experiment 1, the hypotheses showed mixed support. Hypothesis 1 was not supported. Using political identification as a measure for homophily was also not supported, but when the homophily scores were used, Hypothesis 4 was supported. A possible explanation for

the nonsupport of Hypothesis 1 based on post hoc qualitative data will be offered in Chapter 9. A possible explanation for mixed findings around Hypothesis 4 will also be offered in Chapter 9.

In Experiment 2, again the hypotheses garnered mixed support. The main effect for relationalism was supported as were the moderation hypotheses regarding the role of the task. The seeker characteristic hypotheses were not supported with the exception of introversion. Table 56 reviews the hypotheses and whether they received support.

Hyp	Detail	Support?
H1	Interactivity will have a positive relationship with relationalism.	No
H2	Vividness will have a positive relationship with relationalism.	Yes
H3	Customizability will have a positive relationship with relationalism.	Yes
H4	Homophily will have a positive relationship with relationalism.	No
H5	There will be a positive relationship between relationalism and source use.	Yes
H6a	Multiplicity will positively moderate the relationship between relationalism and source use.	Yes
H6b	Uncertainty will positively moderate the relationship between relationalism and source use.	Yes
H7a	Introversion will negatively moderate the relationship between relationalism and source use.	Yes
H7b	Extroversion will positively moderate the relationship between relationalism and source use.	No
H7c	Allocentrism will positively moderate the relationship between relationalism and source use.	No
H7d	Ideocentrism will negatively moderate the relationship between relationalism and source use.	No

Table 56. Review of experimental hypothesis support.

Chapter 8: Survey Results

In addition to the experiments detailed in the previous chapter, a survey of working professionals was also conducted. This chapter details the results of the survey which is divided into the following sections. Section 8.1 briefly reviews the survey procedures and describes the basic demographic characteristics of the sample. Section 8.2 reports the reliability and validity of the sample data. Section 8.3 formally tests the hypotheses that were presented in Chapter 3.

8.1 Procedures and Sample Characteristics

A market research firm (www.markettools.com) was hired to collect the survey data. This organization has access to over 3 million respondents and a dataset of 636 responses was collected. One potential problem with using this type of organization for data collection is the possibility of getting outdated or inappropriate panelists. To address this potential problem, several demographic screening questions were used. Respondents were asked their age, whether they were employed full time, and their job title. Any subject that reported they did not work full time was removed from the dataset. Any subject under the age of 20 was removed from the dataset as well. Any subject over the age of 65 was cross referenced to their job title to make sure they were not retired. Any job title that was student, waitress, retired, or any other job title judged as likely not to use information was removed from the dataset. Lastly respondents were asked to indicate how they agreed with the following statement: “I routinely need to find information to do my job.” Respondents who met the criteria above or disagreed with the previous statement were removed from the dataset. After these records were removed a final dataset of 503 observations was left.

Once the dataset was screened according to the criteria listed above, basic demographic information was calculated. The sample was almost 50-50 in its distribution of males (N=257) and females (N=242). Further the average age of the sample was 40.5 years with average job tenure of almost 9 years. Respondents were asked to classify their job as either technical, managerial or clerical 33.9% of the sample reported their job as being technical in nature (N=171) while 39.5% said their job was managerial (N=199), and lastly 21.8% of the sample reported their job as clerical (N=105). Most respondents worked at a location with 250 or fewer other individuals (N=380) while some worked at locations that had over 1000 other individuals (N=23).

To verify equal numbers of respondents across the four different types of complexity four different surveys were used. The only difference was when respondents were asked to think of a task that required them to find information. Each of the four groups was provided a description of one of the four types of complexity and asked to think of and describe a task they worked on that fit into that general category of complex task. Based on the description respondents saw, 131 surveys were in the low multiplicity, low uncertainty task type. 126 surveys were in the low multiplicity, high uncertainty condition. 109 surveys were high uncertainty, low multiplicity, and 137 surveys were high multiplicity and uncertainty. An analysis of the measures of complexity is presented elsewhere in this chapter.

8.2 Sample Reliability and Validity

Chapter 6 detailed the development of the survey measures and presented their reliability and validity. This section briefly demonstrates the reliability and validity of the sample data. In particular an EFA is conducted to demonstrate the scales are distinctive. In addition to

the EFA indices of reliability are presented as are the latent variable correlations. The latent means, variances and N for the sample data are shown in Table 57**.**

To verify the dimensionality of the data all the study constructs were subjects to an EFA using maximum likelihood and a promax rotation. A promax rotation allows the factors to correlate with each other during the rotation process unlike the orthogonal varimax rotation. Because relationalism is comprised of an affection and a receptivity dimension, relationalism was expected to have 2 dimensions (Walther & Burgoon, 1992). All other constructs were expected to be unidimensional. For the EFA, 15 factors were specified a priori. The results of the EFA indicate that there are 15 factors with no evidence of any cross loading among the factors (see Table 58) though some items did not load as strongly as others. Such clean results were expected due to the rigorous pretesting and scale development that occurred before primary data collection.

	N	**mean**	**variance**
relationalism (aff)	503	4.11	3.23
relationalism (rec)	503	5.41	1.39
interactivity	503	4.03	0.93
vividness	503	3.61	1.94
customizability	503	4.63	1.62
homophily	503	4.42	1.45
multiplicity	503	5.29	1.16
uncertainty	503	3.72	1.93
allocentrism	503	5.42	0.65
ideocentrism	503	4.88	0.54
introversion	503	3.73	1.41
extraversion	503	5.45	1.27

Table 57. Latent factor means and variances.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
rel 1 (aff)	**0.93**	-0.11	-0.02	-0.03	0.02	0.02	0.04	-0.05	0.05	0.06	-0.09	0.02	0.00	0.02	0.00
rel 2 (aff)	**0.99**	-0.04	0.00	-0.04	-0.02	0.02	-0.01	-0.07	0.01	0.01	-0.03	0.01	0.05	0.01	0.01
rel 3 (aff)	**0.87**	0.07	0.02	0.03	0.00	-0.02	-0.02	0.06	-0.05	-0.06	0.05	-0.03	0.02	-0.04	-0.02
rel 4 (aff)	**0.83**	0.08	0.00	0.06	0.03	-0.01	-0.02	0.03	-0.04	-0.05	0.05	-0.04	-0.05	-0.01	0.03
rel 5 (rec)	0.06	**0.68**	0.12	-0.05	-0.03	0.16	0.29	-0.16	0.03	0.12	0.07	-0.01	-0.11	-0.02	0.06
rel 6 (rec)	-0.05	**1.00**	0.02	0.01	0.03	0.01	0.00	-0.02	0.00	-0.01	0.01	-0.01	-0.01	-0.03	0.02
rel 7 (rec)	0.11	**0.72**	0.01	-0.04	-0.09	0.01	0.00	-0.04	0.02	0.01	0.00	-0.01	0.22	0.05	0.00
viv 1	-0.01	0.04	**0.86**	-0.01	0.02	0.03	0.00	-0.04	-0.01	-0.06	-0.04	-0.01	0.01	-0.04	-0.01
viv 2	-0.05	-0.02	**0.76**	0.00	-0.09	-0.02	0.01	0.01	0.03	-0.02	0.01	0.04	0.04	0.02	0.22
viv 3	0.03	0.04	**0.66**	0.03	0.05	-0.04	-0.05	0.00	-0.03	0.06	0.02	0.03	-0.01	0.00	0.13
viv 4	0.01	-0.03	**0.73**	0.01	0.13	0.00	-0.02	0.05	0.00	-0.01	0.04	-0.02	-0.05	0.05	0.06
homophily 1	0.04	0.02	-0.02	**0.69**	-0.04	0.04	-0.06	0.00	0.08	0.00	-0.01	0.05	0.16	0.01	0.02
homophily 2	-0.04	-0.02	0.01	**0.96**	0.02	0.02	-0.02	-0.01	0.01	0.03	0.01	-0.02	-0.05	0.01	-0.03
homophily 3	-0.02	0.03	-0.01	**0.91**	0.02	0.00	0.04	0.00	-0.03	0.02	-0.01	-0.04	-0.02	0.01	0.00
homophily 4	0.05	-0.04	0.03	**0.84**	-0.03	-0.02	0.06	0.01	-0.02	0.01	0.01	0.04	0.02	0.00	0.01
custom 1	0.19	-0.02	-0.05	0.10	**0.73**	-0.10	-0.04	0.08	0.02	-0.01	0.01	0.00	-0.01	0.06	-0.06
custom 2	0.03	0.01	0.07	0.09	**0.65**	0.01	0.10	0.00	-0.04	-0.03	-0.03	-0.01	-0.01	-0.08	0.08
custom 3	-0.02	0.00	-0.01	-0.06	**0.77**	-0.03	0.00	0.02	0.00	0.03	0.01	0.02	0.16	-0.02	0.03
custom 4	-0.03	0.04	0.05	0.00	**0.62**	0.03	-0.09	-0.05	0.03	0.00	0.05	-0.06	0.21	0.08	-0.05
custom 5	-0.06	-0.03	0.06	-0.09	**0.76**	0.08	0.05	-0.08	0.00	0.00	-0.02	0.01	0.12	-0.03	0.01
ex'ver 1	-0.03	0.03	-0.02	0.04	0.02	**0.80**	-0.05	0.13	0.00	0.04	-0.04	0.01	-0.06	-0.03	0.01
ex'ver 2	-0.01	-0.02	-0.02	0.05	0.05	**0.93**	-0.07	-0.01	0.07	-0.07	0.00	-0.02	0.03	0.02	-0.01
ex'ver 3	0.04	0.03	0.03	-0.04	-0.05	**0.70**	0.05	0.03	-0.06	0.00	0.03	0.01	0.03	0.02	0.00
int'ver 1	-0.04	0.08	-0.02	0.04	-0.03	-0.23	**0.67**	0.10	0.09	-0.02	-0.02	-0.01	-0.01	0.03	-0.02
int'ver 2	0.01	-0.02	0.03	0.07	0.02	0.06	**0.72**	-0.10	-0.01	-0.02	0.07	0.01	0.02	-0.02	-0.04
int'ver 3	0.01	-0.02	-0.05	-0.03	0.05	0.02	**0.86**	0.06	-0.04	-0.01	-0.04	0.01	0.04	0.01	0.02

Table 58. EFA results for study constructs.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
allo 1	0.05	0.04	0.05	-0.03	-0.08	0.19	0.11	**0.62**	0.03	0.02	-0.04	-0.01	0.01	0.07	-0.07
allo 2	-0.07	0.00	0.00	0.04	0.02	0.00	-0.03	**0.84**	-0.04	-0.03	0.02	0.00	-0.03	-0.02	0.02
allo 3	0.05	-0.07	0.01	-0.06	0.02	0.00	0.01	**0.84**	0.00	-0.01	0.01	0.04	0.03	0.00	0.03
allo 4	-0.04	-0.02	-0.03	0.04	-0.02	-0.01	-0.03	**0.85**	-0.01	0.04	-0.01	-0.03	0.03	-0.03	0.02
ideo 1	0.02	0.01	0.02	0.05	-0.17	0.04	-0.02	-0.09	**0.62**	0.04	0.03	0.04	0.07	-0.02	-0.01
ideo 2	-0.08	0.00	0.00	0.05	0.08	0.00	0.02	-0.04	**0.81**	-0.05	-0.01	-0.03	-0.05	-0.03	-0.02
ideo 3	0.03	-0.03	-0.05	-0.02	0.05	-0.05	-0.03	0.01	**0.82**	-0.02	-0.06	0.00	0.01	0.01	0.07
ideo 4	0.05	0.06	0.03	-0.11	0.04	0.03	0.09	0.17	**0.51**	0.05	0.08	0.00	-0.06	0.03	-0.06
comp (mult 1)	0.00	0.02	-0.07	0.04	-0.04	0.01	-0.02	0.01	0.00	**0.78**	0.03	0.01	-0.02	0.06	0.01
comp (mult 2)	-0.01	0.01	0.06	0.03	0.03	-0.04	-0.01	0.00	-0.04	**0.98**	-0.07	-0.01	-0.05	-0.01	-0.03
comp (mult 3)	-0.02	-0.04	-0.05	-0.02	0.01	-0.01	-0.01	0.00	0.04	**0.80**	0.09	-0.02	0.11	-0.05	0.03
comp (un 1)	-0.04	0.01	0.00	0.03	-0.05	-0.07	-0.09	0.05	0.04	-0.01	**0.91**	-0.04	0.02	0.00	-0.02
comp (un 2)	-0.07	-0.06	-0.09	0.01	0.07	0.08	0.12	-0.08	-0.06	-0.05	**0.73**	-0.02	0.05	0.05	0.05
comp (un 3)	0.07	0.06	0.13	-0.06	-0.02	0.00	0.01	0.03	0.01	0.13	**0.58**	0.08	-0.07	-0.06	-0.05
access 1	0.01	-0.03	0.07	0.07	0.03	0.00	-0.07	-0.01	-0.01	0.02	-0.04	**0.73**	0.05	0.00	-0.06
access 2	-0.01	-0.07	0.01	-0.08	-0.01	0.02	-0.01	-0.01	0.00	0.02	0.03	**0.90**	0.00	0.03	-0.04
access 3	-0.05	0.18	0.01	0.06	-0.03	-0.01	0.05	0.03	-0.01	-0.05	-0.01	**0.68**	0.03	-0.04	0.01
access 4	0.01	-0.04	-0.06	-0.01	0.00	-0.03	0.04	-0.01	0.02	-0.02	0.01	**0.94**	0.00	0.02	0.05
use 1	0.04	-0.06	0.04	0.01	-0.01	0.00	0.01	0.01	-0.02	-0.03	0.03	0.06	**0.88**	-0.02	-0.05
use 2	-0.01	-0.05	0.00	0.02	-0.05	0.02	0.03	0.01	-0.02	0.00	-0.03	-0.05	**1.00**	0.01	0.01
use 3	0.01	-0.03	-0.02	0.03	-0.04	-0.01	0.02	0.00	0.01	0.00	-0.02	-0.02	**0.99**	-0.04	0.04
use 4	0.02	-0.01	0.04	-0.01	-0.07	-0.03	0.00	0.04	0.04	-0.03	-0.02	-0.04	**0.97**	0.01	-0.03
use 5	-0.01	-0.07	0.05	0.00	-0.02	-0.01	-0.02	-0.01	0.02	-0.01	0.03	-0.02	**0.99**	-0.02	-0.02
use 6	0.00	0.04	0.02	-0.01	-0.02	-0.02	0.01	-0.02	-0.01	-0.02	0.02	-0.04	**0.94**	0.03	0.02

Table 58. EFA results for study constructs.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
quality 1	0.00	-0.05	0.07	0.00	0.04	0.00	0.02	-0.01	0.00	-0.02	-0.02	0.02	-0.01	**0.87**	-0.05
quality 2	0.01	-0.02	0.06	-0.02	0.02	0.00	-0.01	0.00	0.00	-0.04	-0.01	0.01	0.01	**0.89**	0.00
quality 3	0.00	-0.03	-0.03	0.01	0.00	0.01	-0.02	-0.01	-0.01	-0.03	0.03	0.00	0.02	**0.96**	-0.01
quality 4	-0.02	0.01	-0.03	0.01	0.01	-0.01	-0.02	0.01	0.00	-0.03	0.03	0.00	-0.02	**0.97**	0.03
quality 5	0.01	0.04	-0.03	0.03	-0.05	0.01	0.02	0.01	-0.01	0.08	-0.02	-0.01	-0.01	**0.86**	0.03
quality 6	-0.01	0.05	-0.04	0.00	-0.04	-0.01	0.02	-0.01	0.00	0.04	-0.01	0.01	0.00	**0.91**	0.03
interactivity 1	0.02	0.02	-0.06	0.00	0.02	0.01	-0.04	-0.02	0.03	-0.04	0.06	0.06	-0.07	-0.02	**0.95**
interactivity 2	0.11	-0.01	-0.04	-0.02	0.00	-0.01	-0.05	0.03	0.02	-0.02	0.07	0.00	-0.02	0.07	**0.81**
interactivity 3	-0.01	0.02	-0.04	0.00	-0.04	0.03	0.02	0.00	-0.03	0.01	-0.02	0.02	0.01	-0.09	**0.96**
interactivity 4	-0.07	-0.02	0.14	-0.07	0.02	-0.02	-0.01	0.03	0.01	0.05	-0.07	-0.04	0.12	0.09	**0.66**
interactivity 5	-0.04	0.01	0.08	0.06	0.03	0.00	0.07	-0.01	-0.01	0.02	-0.07	-0.08	-0.03	0.01	**0.73**

Table 58. EFA results for study constructs.

	AVE	ICR	α	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
relationalism (aff) (1)	0.86	0.96	0.95	**0.93**														
relationalism (rec) (2)	0.81	0.70	0.89	0.36	**0.90**													
interactivity (3)	0.74	0.93	0.91	0.75	0.35	**0.86**												
vividness (4)	0.71	0.91	0.87	0.61	0.15	0.55	**0.84**											
customizability (5)	0.78	0.91	0.88	0.48	0.32	0.42	0.51	**0.88**										
homophily (6)	0.81	0.94	0.92	0.46	0.38	0.40	0.30	0.45	**0.90**									
multiplicity (7)	0.81	0.93	0.89	0.06	0.23	0.13	0.11	0.15	0.02	**0.90**								
uncertainty (8)	0.70	0.87	0.78	0.10	0.02	0.10	0.19	0.18	0.10	0.34	**0.84**							
use (9)	0.81	0.97	0.97	0.35	0.60	0.29	0.26	0.61	0.44	0.27	0.13	**0.90**						
allocentrism (10)	0.74	0.92	0.88	0.12	0.33	0.17	-0.02	0.13	0.17	0.34	0.01	0.33	**0.86**					
ideocentrism (11)	0.87	0.84	0.78	0.06	0.15	0.09	-0.01	0.05	0.02	0.22	0.04	0.13	0.28	**0.76**				
introversion (12)	0.87	0.86	0.80	0.10	-0.09	0.08	0.27	0.11	0.10	-0.03	0.23	0.03	-0.15	0.04	**0.93**			
extraversion (13)	0.80	0.92	0.87	0.16	0.25	0.16	0.08	0.22	0.18	0.32	0.13	0.27	0.52	0.13	-0.18	**0.89**		
quality (14)	0.81	0.96	0.95	0.28	0.67	0.25	0.14	0.52	0.45	0.22	0.06	0.72	0.37	0.16	-0.02	0.31	**0.90**	
accessibility (15)	0.76	0.93	0.90	0.12	0.43	0.10	0.08	0.35	0.38	0.09	-0.02	0.49	0.21	0.08	-0.01	0.17	0.55	**0.87**

Bolded values on the diagonal are the root AVEs. If the on diagonal values are greater than the off diagonal values, then that construct is reliable.

Table 59. Reliabilities and correlations for study constructs.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	max
relationalism (aff) (1)	--															
relationalism (rec) (2)	0.40	--														0.40
interactivity (3)	0.81	0.39	--													0.81
vividness (4)	0.67	0.17	0.62	--												0.67
customizability (5)	0.53	0.36	0.47	0.58	--											0.58
homophily (6)	0.49	0.42	0.44	0.33	0.46	--										0.49
multiplicity (7)	0.06	0.25	0.14	0.13	0.15	0.02	--									0.25
uncertainty (8)	0.11	0.02	0.12	0.24	0.18	0.10	0.33	--								0.33
use (9)	0.36	0.65	0.31	0.29	0.65	0.49	0.28	0.14	--							0.65
allocentrism (10)	0.13	0.38	0.19	-0.02	0.13	0.17	0.33	0.01	0.32	--						0.38
ideocentrism (11)	0.08	0.17	0.10	-0.01	0.05	0.02	0.21	0.04	0.12	0.34	--					0.34
introversion (12)	0.11	-0.11	0.10	0.33	0.11	0.10	-0.03	0.23	0.03	-0.17	0.05	--				0.33
extraversion (13)	0.17	0.28	0.17	0.09	0.22	0.19	0.33	0.14	0.26	0.59	0.13	-0.22	--			0.59
quality (14)	0.29	0.72	0.26	0.16	0.53	0.47	0.22	0.07	0.72	0.40	0.18	-0.03	0.34	--		0.72
accessibility (15)	0.13	0.49	0.11	0.09	0.34	0.37	0.09	-0.02	0.47	0.24	0.09	-0.01	0.19	0.59	--	0.59

Table 60. Discriminant validities for study constructs.

Next the reliabilities were calculated and several methods of assessing the reliabilities were used. First Cronbach's α was calculated for each construct. In this regard, due to the amount of pretesting, all the scales were expected to demonstrate acceptable reliability, and indeed this was the case (see Table 59). All constructs exceeded Nunnally's (1994) guideline of 0.70. In addition to Cronbach's α, the internal composite reliability (ICR) was also computed. The ICR is interpreted in much the same way as Cronbach's α with values over 0.70 indicating reliability. All study constructs exceeded this value as well. Lastly the average variance extracted was also used to assess reliability. The generally accepted guideline for a scale to be reliable is for the AVE to be greater than 0.50. All the values in Table 59 exceed this value (Fornell & Larker, 1981). Furthermore, another way to use the AVE is to take its root and compare it to the latent construct correlations. If the root AVE exceeds the correlation, then reliability is demonstrated. The root AVEs are on the diagonal in Table 59 and all are greater than the off diagonal values.

Convinced of each scales' reliability, discriminant validity was assessed via two methods. First the latent construct correlation was divided by the root of its reliabilities using Equation 1. This method of assessing discriminant validity corrects the latent construct correlations for measurement error, and discriminant validity is demonstrated if no resultant value exceeds 0.85 (D. T. Campbell & Fiske, 1959b). The reasoning behind this test is that after correcting for measurement error, if the correlation is above 0.85, the constructs are essentially identical and the items are ineffective at discriminating between the two constructs. The results of this analysis are shown in Table 60 and all values are below 0.85. This indicates that each scale is measuring a distinct construct.

The second method to demonstrate discrimnant validity is to conduct a CFA and calculate a chi-square difference test. If the items do not discriminate between constructs, then loading all the items on a single factor in a CFA will result in a good fit. If the items do discriminate between constructs then when the items are loaded on separate factors, the fit will significantly improve. The degree to which loading all items on a single factor results in a less acceptable fit as opposed to loading them on the theorized factor demonstrates that the items are measuring different constructs. When loading all study items on a single factor the resulted in a poor fitting model. The model χ^2_{594}=8611.96, the NFI=0.35, the CFI=0.37, the SRMR=0.16 and the RMSEA=0.16. When the items were loaded on their theorized factors, the resultant 12 factor model yielded an excellent fitting model. The model χ^2_{528}=1291.11, the NFI=0.92, the CFI=0.94, the SRMR=0.05 and the RMSEA=0.05. A chi-square difference test showed the 12 factor model significantly fits the data better χ^2_{66}=7320.85, $p < 0.0001$ thereby corroborating the results generated by using Equation 1.

8.3 Hypothesis Tests

To test the model hypotheses, structural equation modeling (SEM) will be used. SEM allows researchers to assess the measurement model and structural model separately (Anderson & Gerbing, 1988). Using this two step approach allows the researcher to assess the relationships between the latent constructs before assessing the causal relationships that might exist between the exogenous and endogenous variables. To test the measurement and structural models EQS (version 6.1, build 97) was used (Bentler, 1995).

As discussed in Chapter 5 two sets of data were collected—one set contains responses to a given task for a source a respondent could have used, but decided not to while the other set of data contains responses about a given task for a source the respondent actually used. Hence

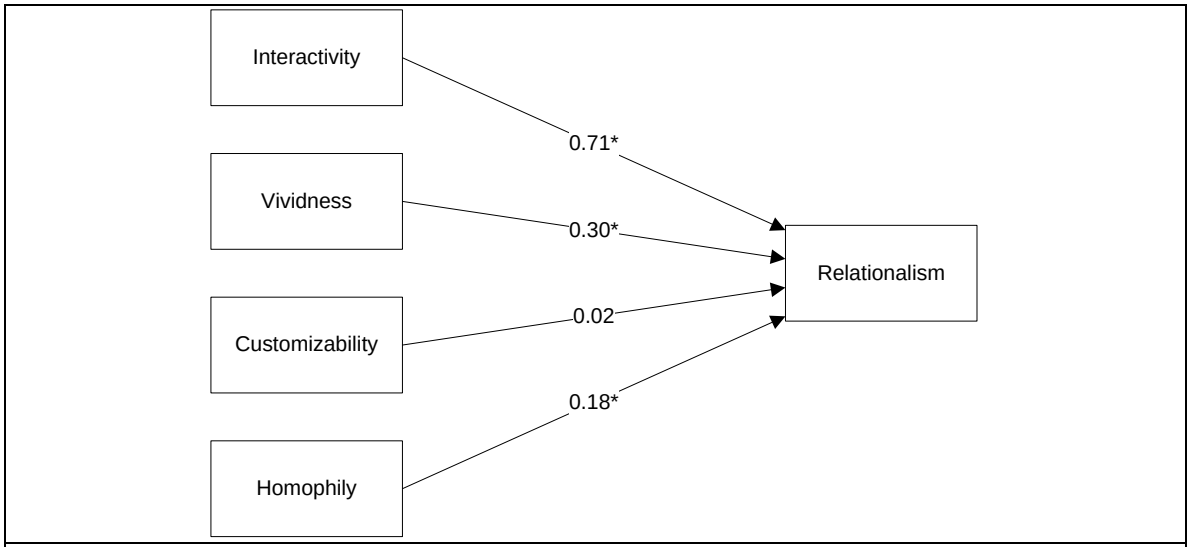
three measurement models were calculated, one for the unused source, one for the used source, and one containing all latent constructs. Assessing the measurement model entails entering all the constructs into the analysis without identifying the causal paths, but instead entering covariance terms between the latent constructs.

For the unused sources, all fifteen latent constructs were analyzed. The resultant model indicates an acceptable measurement model. The model χ^2_{837}=1297.94 ($p < 0.0001$), the NFI = 0.95, the CFI = 0.96, the SRMR = 0.05, and the RMSEA = 0.03 all of which indicates a good fit for the data. For the used sources, all fifteen latent constructs were analyzed. The resultant model indicates an acceptable measurement model. The model χ^2_{837}=1358.03 ($p < 0.0001$), the NFI = 0.96, the CFI = 0.97, the SRMR = 0.04, and the RMSEA = 0.03 all of which indicates a good fit for the data. The final measurement model that was calculated included all the latent constructs for both the used and unused sources. This analysis also demonstrated acceptable fit indices. The model χ^2_{2208}=3366.17 ($p < 0.0001$), the NFI = 0.94, the CFI = 0.95, the SRMR = 0.05, and the RMSEA = 0.03. Since these three analyses all showed the underlying model fit was acceptable, the structural model can be analyzed. The practical relationship between the measurement model and structural model is the measurement model acts as an upper bound on the acceptability of the structural model. If the measurement model has bad fit, then the structural model will as well which would mean the conclusions drawn from the hypothesis testing would be suspect (Kline, 2005).

8.3.1 Hypothesis Testing for Relationalism Antecedents

Since data were collected on two sources—one that respondents used and one they chose not to use, only the data corresponding to the sources used will be used in this analysis. The results of this model are shown in Figure 41.

Hypothesis testing will occur in two steps. Following from the guidelines from Anderson and Gerbing (1988) the measurement model will be estimated then the structural model. The measurement model showed good fit. The model χ^2_{123}=305.39 ($p < 0.0001$), the NFI = 0.94, the CFI = 0.95, the SRMR = 0.06, and the RMSEA = 0.05. Since the measurement model demonstrated good fit, it is appropriate to add the structural paths and test the study hypotheses 1 – 4.



Values marked with * are significant at $\alpha<0.05$

Figure 41. Model to test Hypotheses 1-4.

When the structural model was estimated, the model fit was within accepted parameters. The model χ^2_{123}=305.35 ($p < 0.0001$), the NFI = 0.93, the CFI = 0.95, the SRMR = 0.06, and the RMSEA = 0.05. Looking at the coefficient paths, Hypothesis 1 was supported ($\beta=0.71$, $p<0.001$). Interactivity has a positive relationship with relationalism. Hypothesis 2 was supported as well ($\beta=0.30$, $p<0.001$). Vividness has a positive relationship with relationalism. Hypothesis 3 was not supported ($\beta=0.02$, $p>0.05$). Customizability has no relationship with relationalism. Hypothesis 4 was supported ($\beta=0.18$, $p=0.03$). Homophily has a positive

relationship with relationalism. The implications from these findings are reconciled with the experimental findings in the next chapter.

8.3.2 Hypothesis Testing for Relationalism Preference

In Chapter 3, the hypothesis that relationalism will have a positive relationship with use was developed. Another way of stating this hypothesis is that individuals will prefer to use sources that have higher amounts of relationalism. In the survey, respondents were asked about two different sources. Respondents thought of a task and then completed items for a source that they chose *not* to use as well as the source they did use.

If individuals prefer high relationalism sources then the mean level of relationalism will be higher in the sources they used as opposed to the sources they did not use. To test Hypothesis 5, a structured means model will be used as well as a structural model. This analysis tests for mean differences in the latent constructs and is akin to MANOVA. Where MANOVA is useful for single observation multiple dependent variables, a structural means model allows for multiple observations across multiple dependent variables. This way all the relationalism indicators can be used rather than summing them into a single item.

Conducting a structured means analysis is a multi-step process whereby increasing stringent standards are placed on the data until the latent means can be compared (Byrne, 2008). The first step involves fitting each group individually. Two separate CFAs were conducted. The first, analyzing the not used sources yielded an excellent model fit. The model χ^2_7=19.30 (p=0.007), the NFI = 0.98, the CFI = 0.99, the SRMR = 0.03 and the RMSEA = 0.06. Likewise analyzing the used sources also yielded an excellent model fit. The model χ^2_7=15.03 (p=0.04), the NFI = 0.99, the CFI = 0.99, the SRMR = 0.02 and the RMSEA = 0.04. Since each model demonstrates good fit, the next stage of the analysis can be conducted.

The next step involves analyzing the used and not used sources simultaneously. No restrictions are placed on this constant. The goal of this analysis is to demonstrate configural invariance which incorporates the baseline model from both the used and not used sources and allows their simultaneous analysis (Byrne, 2008). When analyzing both the used and not used sources simultaneously, the model fit the data well. The model χ^2_{14}=9.95 (p=0.76), the NFI = 0.99, the CFI = 0.99, the SRMR = 0.02 and the RMSEA = 0.04. This demonstrates configural invariance and means it is justifiable to move to the next step and test for the invariance of the factor loadings.

Testing for invariance of factor loading involves constraining all factors loadings[12] to be equal across both types of sources. This analysis has two steps. First invariance is tested in the first order factors, and then the second order factor invariance is tested. If this test also demonstrates good model fit, then it is justifiable to move to the next step of the analysis. For the first order factors, when constraining all the factor loadings to be equivalent, the model showed good fit. The model χ^2_{18}=15.62 (p=0.61), the NFI = 0.98, the CFI = 0.99, the SRMR = 0.04 and the RMSEA = 0.05. This demonstrates invariance for the factor loadings and it is justifiable to move to testing for invariance of the second order factor. When testing the invariance of the second order factors, the additional constraint of all factor paths being equivalent is added. The model χ^2_{18}=16.49 (p=0.62), the NFI = 0.98, the CFI = 0.99, the SRMR = 0.04 and the RMSEA = 0.05. Based on these results, it is appropriate to continue to the next step in the process which is testing for intercept invariance.

Much like testing for factor loading invariance, testing for invariance of the intercept is conducted in two steps. Part of this test involves setting the constant term (which serves as the

[12] Loadings that are fixed for purposes of model identification are not constrained (Byrne, 2008).

intercept term) to be equal across all items in all groups. Two other constraints are also imposed which are constraining all first order factor loadings, and all second order factor loadings to be equal. If the model fit of this analysis is acceptable, then it is appropriate to test the invariance of the second order intercepts. The fit results for this analysis are acceptable. The model χ^2_{25}=44.85 (p=0.008), the NFI = 0.98, the CFI = 0.99, the SRMR = 0.04 and the RMSEA = 0.05. To test the invariance of the second order intercepts the first order latent means are constrained to zero in order to make the model identify since the model by definition at this point is underidentified (Byrne, 2008). The constrained model demonstrated excellent fit. The model χ^2_{23}=31.78 (p=0.10), the NFI = 0.98, the CFI = 0.99, the SRMR = 0.04 and the RMSEA = 0.05. Since all these tests of invariance were satisfactory, it is meaningful and appropriate to begin testing the latent factor means.

Relationalism is a higher order factor, so again to test for differences in the latent means, the first order means are investigated, and then the higher order means are investigated. For this analysis the constant is additionally loaded on each of the lower order relationalism factors as well as all the individual items. Further one group is set to zero and the other group is free to vary. Since the hypothesis is that individuals will tend to select sources higher in relationalism, the not used source group was set to zero and becomes the comparison group. Estimates from this analysis refer only to the sources used group. The test statistic is distributed as a z distribution and is interpreted like a z-score. The model fit for this analysis was acceptable. The model χ^2_{22}=27.72 (p=0.18), the NFI = 0.98, the CFI = 0.99, the SRMR = 0.04 and the RMSEA = 0.05. Relative to the not used group the mean for the affection dimension of relationalism is significantly higher in the source used group (z=5.32, p<0.001). Likewise relative

to the not used group the mean for the receptivity dimension of relationalism is significantly higher for the sources used group ($z=7.23$, $p<0.0001$).

Lastly the higher order latent means are compared. Again due to model underindentification issues, the means can be tested in one of three ways. Following from Byrne and Stewart (2006) all the lower order factor means will be set to zero while one higher order mean will be set to zero and the other mean allowed to vary. By setting the lower order means to zero across all groups, this method makes the implicit assumption that the lower order factors do not exist and as such a clearer interpretation of the higher order means is gained. The model fit for this final analysis was acceptable. The model $\chi^2_{25}=50.44$ ($p=0.001$), the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.05. Looking at the second order latent factor mean the mean for relationalism for sources used was 1.04 points higher than for the sources not used ($z=76.07$, $p<0.0001$).

8.3.3 Hypothesis Testing for Task Interactions

In Chapter 3 it was hypothesized that both uncertainty and multiplicity would positively moderate the relationship between relationalism and selection. Since tasks can be described in objective terms based on the uncertain and multiplicitous aspects of the task, it is meaningful and appropriate to aggregate across individuals and tasks despite their working on different tasks (D. J. Campbell, 1988). During data collection, respondents were instructed to think of a work task that corresponded to high or low multiplicity and uncertainty thereby creating four basic task categories. Depending on how the tasks are aggregated this allows for an analysis of the two way interaction of either multiplicity or uncertainty with relationalism. Since data were collected on both sources used and not used the test of Hypotheses 6a and 6b are also analyzed as structured means models.

Respondents were asked to think of a task that corresponded to combinations of low and high multiplicity and uncertainty thereby resulting in four different combinations of tasks. To test for the interaction effects of uncertainty with relationalism and the interaction effects of multiplicity with relationalism, subsets of data will need to be combined. To verify that the task a respondent was thinking of, they completed items to measure perceptions of multiplicity and uncertainty. To test for differences in complexity perceptions, average scores were created for each complexity type and an ANOVA was conducted to verify there are differences between complexity groups.

					differences			
	condition	N	mean	SD	lolo	lohi	hilo	hihi
mult	lolo	131	3.92	1.02	--	yes	yes	yes
	lohi	126	4.17	0.64		--	yes	yes
	hilo	109	6.19	0.59			--	no
	hihi	137	6.21	0.59				--
uncer	lolo	131	2.39	0.93	--	yes	no	yes
	lohi	126	4.38	0.61		--	yes	yes
	hilo	109	2.59	0.81			--	yes
	hihi	137	5.23	0.91				--

Table 61. Descriptive statistics and multiple comparison results for complexity.

With regards to uncertainty there was a significant difference observed between tasks ($F_{(3,499)}$=361.06, MSE=0.68, $p < 0.0001$). Multiple comparisons using Scheffe's method showed differences between tasks that were supposed to be high and low uncertainty. With regards to multiplicity there was a significant difference observed between tasks ($F_{(3,499)}$=357.69, MSE=0.54, $p < 0.0001$). As with uncertainty, Scheffe's multiple comparisons procedure revealed significant differences between the high multiplicity groups versus the low multiplicity groups. The results of these analyses indicate that respondents perceptions of the task matched the instructions they were given. Looking at the means for each condition (shown in Table 61) the differences

between conditions can be seen for each type of complexity. The results of the multiple comparisons are also shown in Table 61 with a condition on a given row compared to the other conditions on the right half of the table.

8.3.3.1 Interaction of Multiplicity with Relationalism

Using the same reasoning underlying the testing of Hypothesis 5, Hypotheses 6a will also be tested as a structured means model. Where in Hypothesis 5 the sources used versus not used formed the two comparison groups, for this analysis there will be the comparison groups high and low multiplicity. The process for these analyses will be the same as in Section 8.3.2; first individual models will be fitted to each group, then test for configural invariance followed by tests for factor invariance, intercept invariance, and lastly the test for differences in the latent construct means.

	χ^2	NFI	CFI	SRMR	RMSEA
low multiplicity	11.01 (7df, p=0.11)	0.98	0.99	0.04	0.05
high multiplicity	8.95 (7 df, p=0.25)	0.99	0.99	0.05	0.03

Table 62. Individual model results for multiplicity interaction hypothesis test.

In the first step, a model was constructed for each group individually. As can be seen in Table 62 all the models showed excellent fit. Since each model shows excellent fit separately, it is appropriate to begin analyzing the groups together imposing more rigorous limitations with each test.

The first analysis involves testing for configural invariance. This is a test to see if the underlying factor structure is equivalent among the groups. Factor loads are allowed to vary between groups, but the model submitted is equivalent across all groups. This model showed excellent fit. The model χ^2_{30}=20.66, the NFI = 0.99, the CFI = 0.99, the SRMR = 0.03 and the RMSEA = 0.04.

The next step is to test for invariance of the factor loadings. For this analysis all the first order factor loadings are constrained to be equal across both samples. This model showed excellent fit. The model χ^2_{18}=29.80, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.05. To complete this analysis the second order factors were also constrained to be equivalent across both samples. This model also showed excellent fit. The model χ^2_{19}=29.81, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.05.

The third step is to test or equivalence of the intercept. For the analysis of the first order intercepts, all the factor loadings are constrained as well as the variable intercepts. The model χ^2_{25}=44.80, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.08 and the RMSEA = 0.05. To test the second order intercept, the first order intercepts are set to zero and the second order intercepts are constrained to be equivalent. This model demonstrated acceptable fit. The model χ^2_{23}=55.91, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.05.

As with Hypothesis 5, the first order latent means will be tested, and then the second order latent means will be tested. Since the low multiplicity group is the baseline comparison, its mean will be set to zero and the high multiplicity mean will be allowed to vary. Hypothesis 6a will be supported if all tests are significant across the first and second order mean tests. The model fit for the first order latent mean test was acceptable. The model χ^2_{22}=32.59, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.04 and the RMSEA = 0.05. For the affection dimension of relationalism, individuals in high multiplicity tasks used higher relationalism sources than in low multiplicity tasks ($z=6.89$, $p<0.0001$). For the receptivity dimension of relationalism, individuals in high multiplicity tasks used higher relationalism sources than in low multiplicity tasks ($z=11.97$, $p<0.0001$).

For the second order latent mean test, all the first order means across both groups were set to zero. This effectively ignores the existence of the lower order factors, thereby allowing the model to be identified for analysis as well as giving a more accurate test of the higher order means (Byrne & Stewart, 2006). The model fit for the second order latent model was acceptable; the model χ^2_{23}=32.59, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.05. Comparing the means between the high and low multiplicity conditions, the mean level of relationalism for the sources used was significantly higher for high multiplicity tasks (z=9.54, p<0.0001). Hypothesis 6a is fully supported.

8.3.3.2 Interaction of Uncertainty with Relationalism

Like Hypothesis 6a, Hypothesis 6b will be analyzed using a structured means model. For this analysis there will be 4 comparison groups—high and low multiplicity combined with sources used and not used. The process for these analyses will be the same as in Section 8.3.2; first individual models will be fitted to each group, then test for configural invariance followed by tests for factor invariance, intercept invariance, and lastly the test for differences in the latent construct means.

	χ^2	NFI	CFI	SRMR	RMSEA
low uncertainty	8.51 (7df, p=0.28)	0.99	0.99	0.02	0.03
high uncertainty	15.41 (7df, p=0.03)	0.98	0.98	0.02	0.06

Table 63. Individual model results for uncertainty interaction hypothesis test.

In the first step, a model was constructed for each group individually. As can be seen in Table 63 all the models showed excellent fit. The latent factor means are also presented in this table. Since each model shows excellent fit separately, it is appropriate to begin analyzing the groups together imposing more rigorous limitations with each test.

The first analysis involves testing for configural invariance. This is a test to see if the underlying factor structure is equivalent among the groups. Factor loads are allowed to vary between groups, but the model submitted is equivalent across all groups. This model showed excellent fit. The model χ^2_{14}=6.69, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.02 and the RMSEA = 0.05.

The next step is to test for invariance of the factor loadings. For this analysis all the first order factor loadings are constrained to be equal across both samples. This model showed excellent fit. The model χ^2_{18}=9.21, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.03 and the RMSEA = 0.04. To complete this analysis the second order factors were also constrained to be equivalent across both samples. This model also showed excellent fit. The model χ^2_{19}=9.71, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.03 and the RMSEA = 0.04.

The third step is to test or equivalence of the intercept. For the analysis of the first order intercepts, all the factor loadings are constrained as well as the variable intercepts. The model χ^2_{25}=50.05, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.10 and the RMSEA = 0.06. While the SRMR is greater than accepted guidelines, all the other fit indices are within acceptable limits. To test the second order intercept, the first order intercepts are set to zero and the second order intercepts are constrained to be equivalent. This model demonstrated acceptable fit. The model χ^2_{23}=37.44, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.08 and the RMSEA = 0.06.

As with Hypothesis 5, the first order latent means will be tested, and then the second order latent means will be tested. Since the low uncertainty group is the baseline comparison, its mean will be set to zero and the high uncertainty group mean will be allowed to vary. Hypothesis 6b will be supported if all tests are significant across the first and second order mean tests. The model fit for the first order latent mean test was acceptable. The model χ^2_{22}=12.97,

the NFI = 0.98, the CFI = 0.99, the SRMR = 0.03 and the RMSEA = 0.04. For the affection dimension of relationalism, individuals in high uncertainty tasks used higher relationalism sources than in low uncertainty tasks ($z=11.27$, $p<0.0001$). For the receptivity dimension of relationalism, individuals in high uncertainty tasks used *lower* relationalism sources than in low uncertainty tasks ($z=-3.13$, $p=0.0008$).

For the second order latent mean test, all the first order means across both groups were set to zero. This effectively ignores the existence of the lower order factors, thereby allowing the model to be identified for analysis as well as giving a more accurate test of the higher order means (Byrne & Stewart, 2006). The model fit for the second order latent model was acceptable; the model $\chi^2_{23}=41.04$, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.07 and the RMSEA = 0.06. Comparing the means between the high and low uncertainty conditions, the mean level of relationalism for the sources used was significantly higher for high uncertainty tasks ($z=3.46$, $p=0.0002$). Hypothesis 6b is supported.

8.3.4 Hypothesis Testing for Personality Interactions

The final set of hypotheses involves testing the seeker characteristics impact on the relationship between relationalism and selection. Where the task characteristics were classified into discrete groups a priori, no such categorization occurred for the seeker characteristics. Instead discrete groups will be constructed from the construct scales. Again a structured means model will be used to test Hypothesis 7. Furthermore each interaction will be tested separately in order to maximize the power of the test, and differences seen among the means will indicate an interaction does exist.

8.3.4.1 Interaction of Introversion with Relationalism

The steps to test the interaction of introversion with relationalism will be the same used when testing the complexity hypotheses in the previous sections. First separate models were run for grouping. To create the introversion groups, percentile scores were created. Respondents who were in the 40th percentile or below were included in the weak introvert group. Respondents in or above the 60th percentile were included in the strong introvert group. Using these percentile scores as cut offs instead of a median split follows from the way the items were used in the experiments conducted by the scale authors (Cheek & Buss, 1981).

The procedure for testing Hypothesis 7a is the same as many of the previous tests. Each model is analyzed separately and the results of these analyses are shown in Table 64. As can be seen these models demonstrated acceptable fit and the next step of the analysis can be performed.

	χ^2	NFI	CFI	SRMR	RMSEA
Weak introversion	2.96 (8df, p=0.96)	0.99	1.00	0.01	0.01
Strong introversion	13.17 (8df, p=0.11)	0.97	0.98	0.08	0.05

Table 64. Individual model results for introversion interaction hypothesis test.

The first analysis involves testing for configural invariance. This is a test to see if the underlying factor structure is equivalent among the groups. Factor loads are allowed to vary between groups, but the model submitted is equivalent across all groups. This model showed excellent fit. The model χ^2_{16}=9.00, the NFI = 0.98, the CFI = 0.98, the SRMR = 0.06 and the RMSEA = 0.07.

The next step is to test for invariance of the factor loadings. For this analysis all the first order factor loadings are constrained to be equal across both samples. This model showed excellent fit. The model χ^2_{20}=35.12, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.07 and the

RMSEA = 0.06. To complete this analysis the second order factors were also constrained to be equivalent across both samples. This model also showed excellent fit. The model χ^2_{21}=35.86, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.07 and the RMSEA = 0.06.

The third step is to test or equivalence of the intercept. For the analysis of the first order intercepts, all the factor loadings are constrained as well as the variable intercepts. The model χ^2_{24}=40.94, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.07 and the RMSEA = 0.06. To test the second order intercept, the first order intercepts are set to zero and the second order intercepts are constrained to be equivalent. This model demonstrated acceptable fit. The model χ^2_{25}=55.78, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.07 and the RMSEA = 0.06.

As with Hypothesis 5, the first order latent means will be tested, and then the second order latent means will be tested. Since the weak introvert group is the baseline comparison, its mean will be set to zero and the strong introvert group mean will be allowed to vary. Hypothesis 7a will be supported if all tests are significant across the first and second order mean tests. The model fit for the first order latent mean test was acceptable. The model χ^2_{24}=50.41, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.07 and the RMSEA = 0.06. For the affection dimension of relationalism, strong introvert individuals used higher relationalism sources than weak introverted individuals (z=3.29, p=0.0005). For the receptivity dimension of relationalism, there was no difference in the relationalism of the sources used between weak and strong introverts (z=-0.07, p=0.47).

For the second order latent mean test, all the first order means across both groups were set to zero. This effectively ignores the existence of the lower order factors, thereby allowing the model to be identified for analysis as well as giving a more accurate test of the higher order means (Byrne & Stewart, 2006). The model fit for the second order latent model was

acceptable; the model χ^2_{25}=91.10, the NFI = 0.98, the CFI = 0.98, the SRMR = 0.07 and the RMSEA = 0.07. Comparing the means between the weak and strong introversion groups, the mean level of relationalism for the sources used was significantly higher for introverts (z=-3.93, p<0.0001). Hypothesis 7a is largely supported. The implications of this finding will be discussed in the next chapter.

8.3.4.2 Interaction of Extraversion with Relationalism

Extraverts are the opposite of introverts. Extraverts seek out interpersonal contact, and as such are expected to exhibit a stronger preference for high relationalism sources as compared to individuals that are less extraverted.

The procedure for testing Hypothesis 7b is the same is identical to the process used in Section 8.3.4.1. Each model is analyzed separately and the results of these analyses are shown in Table 65. As can be seen these models demonstrated acceptable fit and the next step of the analysis can be performed.

	χ^2	NFI	CFI	SRMR	RMSEA
Weak extraversion	2.96 (8df, p=0.96)	0.99	1.00	0.01	0.01
Strong extraversion	13.48 (8df, p=0.09)	0.98	0.99	0.06	0.06

Table 65. Individual model results for extraversion interaction hypothesis test.

The first analysis involves testing for configural invariance. This is a test to see if the underlying factor structure is equivalent among the groups. Factor loads are allowed to vary between groups, but the model submitted is equivalent across all groups. This model showed excellent fit. The model χ^2_{16}=21.96, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.04.

The next step is to test for invariance of the factor loadings. For this analysis all the first order factor loadings are constrained to be equal across both samples. This model showed

excellent fit. The model χ^2_{20}=25.50, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.03. To complete this analysis the second order factors were also constrained to be equivalent across both samples. This model also showed excellent fit. The model χ^2_{21}=28.33, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.06 and the RMSEA = 0.04.

The third step is to test the equivalence of the intercept. For the analysis of the first order intercepts, all the factor loadings are constrained as well as the variable intercepts. The model χ^2_{24}=61.67, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.06 and the RMSEA = 0.04. To test the second order intercept, the first order intercepts are set to zero and the second order intercepts are constrained to be equivalent. This model demonstrated acceptable fit. The model χ^2_{25}=37.90, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.04.

As with Hypothesis 5, the first order latent means will be tested, and then the second order latent means will be tested. Since the weak introvert group is the baseline comparison, its mean will be set to zero and the strong introvert group mean will be allowed to vary. Hypothesis 7b will be supported if all tests are significant across the first and second order mean tests. The model fit for the first order latent mean test was acceptable. The model χ^2_{24}=31.54, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.04. For the affection dimension of relationalism, there was a significant difference in the relationalism of the sources used between weak and strong extraverts (z=3.58, p=0.0002). For the receptivity dimension of relationalism, there was a significant difference in the relationalism of the sources used between weak and strong extraverts (z=5.12, p<0.0001) with strong extraverts as expected selecting sources that are significantly higher in relationalism.

For the second order latent mean test, all the first order means across both groups were set to zero. This effectively ignores the existence of the lower order factors, thereby allowing

the model to be identified for analysis as well as giving a more accurate test of the higher order means (Byrne & Stewart, 2006). The model fit for the second order latent model was acceptable; the model χ^2_{25}=37.33, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.07 and the RMSEA = 0.04. Comparing the means between the weak and strong extraversion groups, the mean level of relationalism for the sources used was significantly higher for strong extraverts (z=6.79, p<0.0001). Hypothesis 7b is supported. The implications of this finding will be discussed in the next chapter.

8.3.4.3 Interaction of Allocentrism with Relationalism

Allocentrism refers to individuals who place the welfare of their group above their own personaldesires and wants. It is expected that since allocentrics are more aware of group norms place more value on the norms of the group, the increased importance of social relationships would be reflected in their preferences for information sources. In particular, strong allocentrics would exhibit a stronger preference for high relationalism sources over individuals with weaker allocentric tendencies. The process for testing this hypothesis is the same as the one used in Section 8.3.4.2. The analysis starts by analyzing each model separately. The results of these analyses are shown in Table 66. As can be seen these models demonstrated acceptable fit and the next step of the analysis can be performed.

	S-B χ^2	NFI	CFI	SRMR	RMSEA
Weak allocentrism	11.70 (8df, p=0.16)	0.98	0.98	0.08	0.04
Strong allocentrism	5.27 (8df, p=0.72)	0.99	1.00	0.03	0.01

Table 66. Individual model results for allocentrism interaction hypothesis test.

The first analysis involves testing for configural invariance. This is a test to see if the underlying factor structure is equivalent among the groups. Factor loads are allowed to vary between groups, but the model submitted is equivalent across all groups. This model showed

excellent fit. The model χ^2_{16}=20.02, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.03.

The next step is to test for invariance of the factor loadings. For this analysis all the first order factor loadings are constrained to be equal across both samples. This model showed excellent fit. The model χ^2_{20}=25.71, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.03. To complete this analysis the second order factors were also constrained to be equivalent across both samples. This model also showed excellent fit. The model χ^2_{21}=26.32, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.03.

The third step is to test or equivalence of the intercept. For the analysis of the first order intercepts, all the factor loadings are constrained as well as the variable intercepts. The model χ^2_{26}=94.52, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.08 and the RMSEA = 0.05. To test the second order intercept, the first order intercepts are set to zero and the second order intercepts are constrained to be equivalent. This model demonstrated acceptable fit. The model χ^2_{25}=28.21, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.04.

As with Hypothesis 5, the first order latent means will be tested, and then the second order latent means will be tested. Since the weak introvert group is the baseline comparison, its mean will be set to zero and the strong introvert group mean will be allowed to vary. Hypothesis 7c will be supported if all tests are significant across the first and second order mean tests. The model fit for the first order latent mean test was acceptable. The model χ^2_{24}=32.98, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.06 and the RMSEA = 0.04. For the affection dimension of relationalism, there was a significant difference in the relationalism of the sources used between weak and strong allocentrists (z=2.46, p=0.007). For the receptivity dimension of

relationalism, there was a significant difference in the relationalism of the sources used between weak and strong allocentrists ($z=6.90$, $p<0.0001$).

For the second order latent mean test, all the first order means across both groups were set to zero. This effectively ignores the existence of the lower order factors, thereby allowing the model to be identified for analysis as well as giving a more accurate test of the higher order means (Byrne & Stewart, 2006). The model fit for the second order latent model was acceptable; the model $\chi^2_{25}=64.26$, the NFI = 0.97, the CFI = 0.98, the SRMR = 0.08 and the RMSEA = 0.07. Comparing the means between the weak and strong allocentrist groups, the mean level of relationalism for the sources used was significantly higher for strong allocentrists ($z=9.35$, $p<0.0001$). Hypothesis 7c is supported. The implications of this finding will be discussed and reconciled with the experimental results in the next chapter.

8.3.4.4 Interaction of Ideocentrism with Relationalism

Ideocentrists are the opposite of allocentrists. Ideocentrists do not have a strong sense of community and are much more likely to ignore group norms. It is expected that this type of individual would not be particularly inclined to seek out high relationalism sources, and that their tendencies toward doing things for themselves and ignoring group norms would make them less likely to use high relationalism sources. The process for testing this hypothesis is the same as the one used in Section 8.3.4.2. The analysis starts by analyzing each model separately. The results of these analyses are shown in Table 67. As can be seen these models demonstrated acceptable fit and the next step of the analysis can be performed.

The first analysis involves testing for configural invariance. This is a test to see if the underlying factor structure is equivalent among the groups. Factor loads are allowed to vary between groups, but the model submitted is equivalent across all groups. This model showed

excellent fit. The model χ^2_{16}=13.71, the NFI = 0.99, the CFI = 1.00, the SRMR = 0.03 and the RMSEA = 0.01.

	χ^2	NFI	CFI	SRMR	RMSEA
Weak ideocentrism	3.06 (8df, p=0.93)	0.99	1.00	0.02	0.01
Strong ideocentrism	16.68 (8df, p=0.03)	0.98	0.99	0.07	0.06

Table 67. Individual model results for ideocentrism interaction hypothesis test.

The next step is to test for invariance of the factor loadings. For this analysis all the first order factor loadings are constrained to be equal across both samples. This model showed excellent fit. The model χ^2_{20}=17.46, the NFI = 0.99, the CFI = 0.99, the SRMR = 0.04 and the RMSEA = 0.01. To complete this analysis the second order factors were also constrained to be equivalent across both samples. This model also showed excellent fit. The model χ^2_{21}=19.89, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.06 and the RMSEA = 0.01.

The third step is to test or equivalence of the intercept. For the analysis of the first order intercepts, all the factor loadings are constrained as well as the variable intercepts. The model χ^2_{26}=26.34, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.04 and the RMSEA = 0.01. To test the second order intercept, the first order intercepts are set to zero and the second order intercepts are constrained to be equivalent. This model demonstrated acceptable fit. The model χ^2_{25}=26.31, the NFI = 0.98, the CFI = 0.99, the SRMR = 0.06 and the RMSEA = 0.01.

As with Hypothesis 5, the first order latent means will be tested, and then the second order latent means will be tested. Since the weak ideocentrist group is the baseline comparison, its mean will be set to zero and the strong ideocentrist group mean will be allowed to vary. Hypothesis 7d will be supported if all tests are significant across the first and second order mean tests. The model fit for the first order latent mean test was acceptable. The model χ^2_{24}=23.86, the NFI = 0.99, the CFI = 0.99, the SRMR = 0.05 and the RMSEA = 0.02. For the affection

dimension of relationalism, there was a significant difference in the relationalism of the sources used between weak and strong ideocentrists (z=-2.55, p=0.005). For the receptivity dimension of relationalism, there was a significant difference in the relationalism of the sources used between weak and strong ideocentrists (z=-2.51, p=0.006).

For the second order latent mean test, all the first order means across both groups were set to zero. This effectively ignores the existence of the lower order factors, thereby allowing the model to be identified for analysis as well as giving a more accurate test of the higher order means (Byrne & Stewart, 2006). The model fit for the second order latent model was acceptable; the model χ^2_{25}=23.38, the NFI = 0.99, the CFI = 0.99, the SRMR = 0.04 and the RMSEA = 0.02. Comparing the means between the weak and strong ideocentrist groups, the mean level of relationalism for the sources used was significantly lower for strong ideocentrists (z=-2.94, p=0.002). Hypothesis 7d is fully supported. The implications of this finding will be discussed and reconciled with the experimental results in the next chapter.

8.4 Survey Analyses Summary

This chapter analyzed the data from the survey of 600 working professionals. The study hypotheses were largely supported. For a review, see Table 68**.** Some interesting patterns were seen in the results particularly in light of the results from the two experiments whose results were detailed in Chapter 7. The final chapter of this document reconciles the results of these analyses and discusses the implications of these results for both practitioners and academic researchers as well as provides suggestions for future work to build upon the foundation this work provides.

Hyp	Detail	Support?
H1	Interactivity will have a positive relationship with relationalism.	Yes
H2	Vividness will have a positive relationship with relationalism.	Yes
H3	Customizability will have a positive relationship with relationalism.	No
H4	Homophily will have a positive relationship with relationalism.	Yes
H5	There will be a positive relationship between relationalism and source use.	Yes
H6a	Multiplicity will positively moderate the relationship between relationalism and source use.	Yes
H6b	Uncertainty will positively moderate the relationship between relationalism and source use.	Yes
H7a	Introversion will negatively moderate the relationship between relationalism and source use.	Yes
H7b	Extroversion will positively moderate the relationship between relationalism and source use.	Yes
H7c	Allocentrism will positively moderate the relationship between relationalism and source use.	Yes
H7d	Ideocentrism will negatively moderate the relationship between relationalism and source use.	Yes

Table 68. Review of survey hypothesis support.

Chapter 9: Post Hoc Analyses, Implications & Future Research

This project has sought to develop a new construct that will help explain source selection. The findings contained in this document contribute to the information seeking and source selection literature, particularly the literature related to IT-enabled communication technologies. The new construct, relationalism, was proposed, developed, and tested, and the results of those tests appear very promising. This chapter will briefly review the results and provide interpretations for them. In addition the limitations of this project will be reviewed, opportunities for future work will be identified, and the major takeaways will be presented.

In Chapter 2, several theoretical perspectives were reviewed that inform this study. Central to this work was the role of O'Reilly's (1982) work, which argues that a model of source selection should include source, task, and seeker characteristics. The definition of relationalism was also presented in this chapter. Relationships are the key component of relationalism, so literature surrounding how relationships develop was also reviewed. In particular, key points about the differences between social and an exchange relationships were discussed (Blau, 1964; M. S. Clark & Mills, 1993).Whereas source selection has been viewed as a simple economic cost-benefit analysis (P. J. Carlson & Davis, 1998; Vancouver & Morrison, 1995), the concept of relationalism relies on social relationships to be effective. Hence, theories germane to relationship formation were also presented. Social exchange theory (Blau, 1964), uncertainty reduction theory (Berger & Calabrese, 1975), and anthropomorhization theory (Epley et al., 2007) were drawn upon for guidance about how relationships form, which, in turn, supported this study's argument that individuals can form relationships with inanimate objects. Finally Walther and Burgoon's (1992) theory of relational communication which asserts that individuals will use whatever resources are available subject to the constraints of the source to engage in

impression management. In other words this theory purports that individuals use sources socially and will use them to develop relationships. Chapter 2 ended with a discussion about what characteristics are conducive to social relationship formation. Based on a review of the literature across several academic disciplines, four antecedents were found that help enable relationship formation: feedback, shared history multiple cues, and identification.

In Chapter 3, the research model operationalized the four antecedents identified in Chapter 2. These antecedents were hypothesized to have positive relationships with relationalism. Specifically, the effects of three design elements—interactivity, vividness, and customizability—and the social element—homophily—were expected to impact relationalism. Furthermore, in Chapter 3, the research model operationalized source, task, and seeker characteristics. In particular, relationalism is the primary source characteristic under investigation, while two aspects of task complexity (D. J. Campbell, 1988), two personality traits (Eysenck, 1990), and culture (H. C. Triandis et al., 1985) serve as the task and seeker constructs in this study's research model. In addition, two known source characteristics—information quality (O'Reilly, 1982) and source accessibility (Culnan, 1983)—were included as control variables.

Chapter 4 expands on the research model and hypotheses presented in Chapter 3 by detailing the first of two methods used to test the hypotheses. Two experiments were developed: the first testing the antecedents to relationalism and the second testing source selection. The reasoning for using an experiment was presented as well as the methods, procedures, and analysis plan. As with any research design, there are some shortcomings and tradeoffs that have to be made. The biggest sacrifice made in terms of the experiment is that it only looked at a single type of source, while in reality, individuals can choose from many types

of sources. This is the primary reason behind conducting a survey of working professionals in addition to conducting the experiments.

Chapter 5 continues the model expansion begun in Chapter 4 by laying out the plan for surveying the working professionals. In this chapter, plans were developed for who would be surveyed, how many participants would be needed, and how the data would be collected and analyzed.

The next three chapters—Chapter 6, Chapter 7, and Chapter 8—all presented the results of the experiments and the survey. Since relationalism is a new construct, it was subjected to a thorough analysis as part of its development process. Guidelines for construct development established by others informed the process that the relationalism scale went through in terms of generating items and subjecting those items to increasingly rigorous analyses to verify that the final scale was both reliable and valid (Churchill, 1979; Loevinger, 1957; Moore & Benbasat, 1991). Chapter 6 detailed the process of how the relationalism scale was rigorously developed and validated. Chapter 7 presented the results from Experiment 1 and Experiment 2. Lastly, Chapter 8 presented the results from a survey of 600 currently employed information professionals.

The rest of this chapter is devoted to discussing the results presented in Chapter 7 and Chapter 8, reconciling any differences between the results and the methods used and integrating these findings into a coherent whole that can be used to inform future researchers in the information source selection area. This chapter ends by examining these results in light of the limitations of the study and provides major takeaways for both practitioners and researchers.

9.1 Discussion of Results

Part of the strength of this work rests in using multiple methods. The experiment investigates a single type of source in a controlled setting while the survey allows for any information source to be considered. Due to the multiple methods employed in this research, discussing the results will be divided into three sections. The first discusses the results of the experiments, the second details the results of the survey, and the third integrates these findings into a cohesive whole.

9.1.1 Discussion of Experiments 1 & 2

Between Experiments 1 and 2 the entire research model (see Figure 8) was investigated. The first experiment tested relationalism and its antecedents, while the second tested how relationalism impacted source selection. Across both experiments, the hypotheses were largely supported with the exception of the hypotheses related to interactivity and seeker characteristics.

In Experiment 1, it was expected that all four antecedents, interactivity, vividness, customizability and homphily would positively impact participants' perceptions of relationalism. For the vividness and customizability constructs, their impact on relationalism was clear and unquestionable, as both constructs had the hypothesized relationship with relationalism. Based on the results seen in Experiment 1, organizations interested in providing high relationalism information sources to its users should definitely take the time to develop sources that are both vivid and customizable.

The fact that the hypothesis involving interactivity was not supported came as a surprise, particularly since interactivity and vividness are typically strongly associated with each other in HCI studies (Bonebrake, 2002; Fortin & Dholakia, 2005; Steuer, 1992). It was

determined that these findings were not the result of improperly implemented interactivity. During the pretesting phase, subjects clearly said that they felt the high interactivity sites were in fact interactive, and the perceptual interactivity data from Experiment 1 clearly shows mean differences in the levels of perceived interactivity among the websites. To try to understand why these results were obtained, a qualitative post hoc analysis was conducted. The Experiment 1 subjects were emailed and asked to participate in an extended group interview. Of the 110 subjects who completely participated in Experiment 1, 15 subjects were able to come to an evening interview session. The interview lasted for approximately one hour. In the interview several common themes appeared. Firstly, subjects liked the higher relationalism sites over the lower relationalism sites. Secondly, subjects responded very well to the vividness and customizability features of the websites. The third theme dealt with the interactivity features of the websites. While subjects reported that they appreciated the interactivity features of the website, many of them also felt intimidated actually using these features to contact the governor. (The interactivity features are shown in Table 69.)

Interactivity		Vividness		Customizability	
Low	High	Low	High	Low	High
No comment	Comment	B&W charts	Color charts	No layout color	Layout color
No polls	Polls	No pictures	Pictures	No favorites	Favorites
No chat	Chat	No audio	Audio	No toggle	Toggle

Table 69. Review of website features for each construct.

Interactivity was implemented via three methods. The first was a chat feature, the second was in email form, and the third was a comment section at the bottom of the policy pages. No data were collected during the time period when the governor was ostensibly online and available to chat with constituents, but the general pattern of responses from these subjects was that they did not have anything to say to the governor of North Dakota, since the

majority of these subjects were from upstate New York. They felt most comfortable using the comment sections and were happy that the chat function said the governor was unavailable.

Based on the results of the qualitative interviews, a post hoc multiple regression was conducted using the perceptual measures for all of the antecedents and relationalism, and the result of this analysis was significant ($F_{(4,805)}$=472.54, MSE=0.32, p<0.0001). The result for interactivity in particular was significant (β=0.13, t=7.41, p<0.0001), which does support Hypothesis 1 and supports the notion that interactivity was properly implemented. Reconciling the differences between the qualitative results, the ANOVA, and the regression, it appears that the non-significant results were most likely due to subjects' apprehensiveness about potentially interacting with the governor of a state over 1500 miles away whose policies had little direct impact upon their lives.

Another surprising finding from Experiment 1 dealt with homophily. It was expected that conservatives would identify with the governor and like the website content more than their liberal counterparts, thereby rating the relationalism of the sites higher than the more liberal subjects. As part of site development, the content was reviewed by experts knowledgeable about mainstream conservative thought. The experts said the content conformed to mainstream conservative ideas but that conservatives were not a unitary group. The site content was selected to reflect major challenges that a governor would face (e.g., employment or education) instead of hot-button polarizing issues (e.g. abortion).

As part of the qualitative interview, subjects were also asked about how the content made them feel, particularly toward the governor. Subjects reported mixed feelings about the governor for the most part. Everyone in the interview had something good and bad to say about the various policies laid out on the websites. What was thought to be a good way to manipulate

homophily turned out to be rather ineffective. When asked what should be on the sites to elicit positive responses from conservatives and negative responses from liberals, the sample of 15 interviewees could not agree on consistent content that would have universal appeal (or repulsion).

While the face validity of the experimental manipulation looked appropriate, manipulating feelings of homophily is more complex than what the experiment accomplished, which is the reason behind the post hoc test regressing relationalism on homophily using the perceptual measure. In accordance with Hypothesis 4, there was a significant relationship ($\beta=0.26$, $t=13.33$, $p<0.0001$). This seeming discrepancy in the findings between the experimental manipulation and the perceptual measures would indicate that the impact of homphily on relationalism is more complex than anticipated. The perceptual homophily measure instead of picking up solely on political affiliation measured how subjects felt the site was like and unlike them.

For Experiment 2, the hypotheses were largely supported. As expected in the baseline relationship, a strong, positive relationship was seen between relationalism and selection. Furthermore, the effects of the task moderated the relationship between relationalism and selection, as was anticipated. The seeker hypotheses were largely unsupported though.

Individuals socially orient themselves in their physical environment and prefer socialized information sources—sources capable of conveying a relationship. Evolutionary theory would argue this is the case because this preference has encoded itself in our genes (Calabuig & Olcina, 2009; Wilson & Kniffin, 2009). The results from Experiment 2 clearly support this line of reasoning, with subjects choosing higher relationalism sources over low relationalism sources. Figure 37 clearly shows that the probability of using the lowest relationalism sources is

approximately .10, while the highest relationalism sources have a .90 probability of being selected.

Furthermore, relationships are dyadic in nature; therefore, they require work and maintenance in order to keep functioning. Social exchange theory argues that when individuals interact, they take turns sharing similar information. Further, as shown in Figure 6, both relational and content communication occurs. Conveying both of these aspects is less efficient than simply conveying content alone. For this reason it was expected that the task would moderate the relationship between relationalism and use.

Hypothesis 6a and 6b were supported. Looking at Figure 38, when tasks were simple, the probability of using higher relationalism sources increased, but it increased less than if the task had complex elements. Also, when the task was simple, the probability of using a lower relationalism source was greater than the probability of using a source with the same level of relationalism when the task was more complex. These findings are in line with theory, which states that selection is essentially a cost-benefit analysis. When the task is more complex, the benefits from using a higher cost, higher relationalism source is offset by the increased benefits a high relationalism source provides.

An interesting post hoc test comparing multiplicity to uncertainty was conducted to see if subjects' preference for relationalism changed depending on the type of complex task. When comparing uncertainty to multiplicity, there was no difference ($F_{(1, 304)}$=0.04, p=0.83), which indicates that individuals' preference for higher relationalism sources does not depend on the type of complexity. Any type of complexity decreased the probability of selecting a low relationalism source and thereby increased the likelihood of selecting a high relationalism source.

The seeker characteristic hypotheses were largely unsupported. Only the interaction between relationalism and introversion was supported. Introverts are theorized to have higher levels of cortical arousal when interacting with others and are, therefore, less likely to interact with other individuals (Eysenck, 1990; Eysenck & Eysenck, 1985). There are two lines of thought about how introversion would impact individuals' preference for relationalism. The first is the "rich-get–richer" school of thought, which states that in mediated environments, introverts would continue to avoid interpersonal contact. The second school of thought takes the opposite stance, arguing that the mediated environment takes the edge off the interaction and, therefore, reduces cortical stimulation (Amichai-Hamburger et al., 2008; Kraut et al., 1998). The findings in this research support the rich-get-richer view. Stronger introverts were significantly less likely to select higher relationalism sources in comparison to the less introverted subjects. With regards to extraverts, it appears that simply being an extravert is enough to drive preference for higher relationalism sources. No amount of additional extraversion made an individual more likely to use the highest relationalism sources available.

The cultural hypotheses were also unsupported. Theory argues that allocentrics are concerned with group norms and are focused on the welfare of the group, thereby leading this research to argue that this tendency would translate into a preference for sources that conveyed relationship aspects; however, the data reveal no such relationship. This could be due to the fact that the experimental sample was comprised of undergraduate students with no real ties to one another. Further the assigned task occurred outside of a group context. Therefore, there were not any group norms or expectations to encourage subjects to conform when selecting a source. Because Ideocentrics are more likely to forego any sort of information

source, it is not particularly surprising that the ideocentrism hypothesis was not supported in comparison to the other seeker characteristic hypotheses.

9.1.2 Discussion of Survey Results

The survey also tested all of the research hypotheses. A sample of 636 working professionals was obtained, though after screening the final dataset yielded 503 usable responses. Respondents were instructed to think of a recent work task that required them to find information and to respond to the survey items while thinking about a source they chose not to use as well as a source that they did use. Where in the experiment the only sources available were the experimentally created websites, in the survey, respondents were free to think of any source be it another person, a website, or something else.

For the relationalism antecedents, interactivity, vividness, and homophily all showed significant positive relationships with relationalism. From this, it can be deduced that if source designers want to develop sources with which users can conceivably form relationships, they need to focus on developing sources that are communicative and rich and that users can identify with. Only customizability did not show a relationship with relationalism.

A possible explanation for this finding is that since respondents were free to think of any source, the type of source thought of acted as a confound and masked the true relationship between customizability and relationalism. Potentially respondents could be thinking of noncustomizable sources that were had high amounts of relationalism thereby masking a relationship between customizability and relationalism. To test this idea, a post hoc analysis was conducted. The source data were classified into three categories—web, person, and other—and Hypothesis 3 was retested using only the web and person sources. These two sources were selected because, of the three source types, they are the most easily customizable. When

analyzed, customizability still demonstrated no relationship with relationalism, though the results did approach significance (β_{cus}=0.11, p=0.06). When only the sources that are easily customizable are considered, it appears that the type of source of which a respondent was thinking confounded the results (easy customizable versus not easily customizable). As such, it appears that customizability potentially plays a role in the development of relationalism, but its role is reduced in comparison to the other three factors.

When the sources respondents used were compared to the sources they considered, but did not use, the relationalism of the used sources was significantly greater than the relationalism of the unused sources. Thus, Hypothesis 5 was clearly supported, as would be expected from an evolutionary standpoint (Gallup, 1982).

The role of the task also moderated individuals' preference for relationalism. Respondents were free to think of any work task but were given parameters to consider as they thought of a task. While there was not a formal manipulation check as in the experiments, perceptual measures of task complexity verified that individuals rated the tasks they were considering along proper complexity dimensions.

Since relationalism is a multidimensional construct, the latent factor means cannot be calculated (Bentler, 1995). However, when testing the mean differences between the latent factors, the parameter corresponds to the difference between these means. In the baseline condition, the mean is set to zero, and the coefficient corresponds to the degree to which that other mean is greater than (or less than) the baseline condition (Byrne, 2008; Byrne & Stewart, 2006). When faced with a more multiplicitous task, individuals prefer sources that are 0.71 points (on a 7-point scale) higher in relationalism. When faced with a more uncertain task, individuals prefer sources that are 0.69 points (on a 7-point scale) higher in relationalism.

Assuming the relationalism scale linearly increases, this is akin to saying that when the task becomes more complex, individuals choose sources that are almost 12% higher in relationalism than when faced with a simpler task.

The personality and culture hypotheses also proved to be significant. For the second order means, strong extraverts used sources with significantly more relationalism than weak extraverts. On average, their sources were more relational by a factor of 0.48. The converse was true for introverts, with the strong introverts choosing sources that on average had 0.82 less relationalism than weak introverts. Both of these findings support the theoretical argument that extraverts will gravitate toward sources with high relationalism, while introverts will avoid them (Amichai-Hamburger et al., 2008).

Both culture hypotheses were also supported in the hypothesized direction. Strong allocentrics, who are more cognizant of social norms and more tied to their social network, tended to use sources that were 0.12 points higher in relationalism than weak allocentrics. Conversely strong ideocentrics tended to use sources .36 points lower in relationalism than weak ideocentrics. In the survey, respondents were asked to name the source of which they were thinking, and if that source was a person, they were told to name their relationship to the respondent.

A couple of individuals named a book or some other type of print media and instead of leaving the relationship question blank, wrote in that they preferred to figure things out for themselves. Both of these individuals had extremely high ideocentrism scores. Rather than ideocentrism negatively moderating the relationship between relationalism and selection, strong ideocentrism could be an indicator for no selection. One of the first decisions an individual has to make when selecting a source is whether to go to a source or try to resolve the

issue on their own. Based on these two comments, it could be that ideocentrics prefer to figure things out for themselves and not rely on any source. Future research should investigate this more fully.

9.1.3 Reconciling Experimental and Survey Differences

One of the strengths of this research is the usage of multiple methods to assess the research model. While it was expected that prior to data analysis the differences between the experiment and the survey would be minimal. As can be seen in Table 70, this was largely the case, but there were discrepancies seen across the methods in several places. Differences in support were seen for Hypothesis 1, Hypothesis 3, Hypothesis 4 and Hypotheses 7b-7d.

One possible reason these differences were seen is due to the slightly different dependent variables for the survey and experiment. In the experiment subjects merely selected a source that they would like to use while in the survey respondents were thinking of sources they had actually used. This is a small but potentially important distinction. When an individual selects a source to use, upon using it, the individual might discover what appeared to be a useful source is not as useful as originally anticipated. This would necessitate the selection of a new source. The experiment only captures the initial selection of a single source while the survey captures the end result of this process. This is akin to the strong yet still imperfect correlation between intended behavior and actual behavior in the Theory of Reasoned Action (Ajzen & Fishbein, 1980). Future research into this potentially important distinction is needed to discover the extent of the differences between selection and use.

It should not be too surprising differences were seen given that in the experiment the type of source was standardized while the survey respondents were free to select any source. Further the relationship between seeker and source was likely to be different as well. In the

experiment, all the sites were new to the subjects; whereas, in the survey the respondent could complete survey items based on a source she has an ongoing relationship with. While it is argued that a relationship can form quickly between seeker and source, it also stands to reason that the relationship will not remain static. The multiple methods, despite not yielding identical results, offer the opportunity to triangulate on what exactly relationalism is and how it relates with other constructs.

Hypothesis	Exp	Survey	Explanation for Discrepancy
H1: Interactivity will have a positive relationship with relationalism.	No	Yes	The experiment concluded once a subject selected a source and never used it. The survey required respondents to think of a source they had actually used.
H2: Vividness will have a positive relationship with relationalism.	Yes	Yes	
H3: Customizability will have a positive relationship with relationalism.	Yes	No	Customizability effects for survey sources could be masked in the different types of sources respondents considered while completing the survey.
H4: Homophily will have a positive relationship with relationalism.	No	Yes	The objective manipulation of homophily was ineffective. Regardless of political affiliation subjects found something to like about the governor. Using the perceptual scale did yield significant results for homophily.
H5: Relationalism will have a positive relationship with source selection.	Yes	Yes	
H6a: Multiplicity will positively moderate the relationship between relationalism and source selection.	Yes	Yes	
H6b: Uncertainty will positively moderate the relationship between relationalism and source selection.	Yes	Yes	
Table 70. Review of hypotheses support for both methods.			

Hypothesis	Exp	Survey	Explanation for Discrepancy
H7a: Introversion will negatively moderate the relationship between relationalism and source selection.	Yes	Yes	
H7b: Extraversion will positively moderate the relationship between relationalism and source selection.	No	Yes	Due to anonymity it is difficult to determine why these findings conflicted. One potential explanation is the large sample size used in the survey (N=503) is detecting trivial differences.
H7c: Allocentrism will positively moderate the relationship between relationalism and source selection.	No	Yes	Due to subject anonymity it is difficult to determine why these findings conflicted. One potential explanation is the large sample size used in the survey (N=503) is detecting trivial differences.
H7d: Ideocentrism will negatively moderate the relationship between relationalism and source selection.	No	Yes	Due to subject anonymity it is difficult to determine why these findings conflicted. One potential explanation is the large sample size used in the survey (N=503) is detecting trivial differences.
Table 70. Review of hypotheses support for both methods.			

Interactivity was expected to demonstrate a positive relationship with relationalism across both methodologies. The additional qualitative interviews proved invaluable in discovering a possible cause for the discrepancy between the two findings. While subjects did perceive the interactivity manipulation correctly, the subjects who participated in the interview expressed apprehension about sending the governor messages.

In the survey, respondents were searching for an actual work-related need and were thinking about a source of their own choosing. In the experiment, individuals were searching in response to an experimentally mandated need that bore no relevance to their lives. It is important to remember that during the experiment, subjects actually thought they were dealing with the real governor's website and that their messages would be seen by someone in the governor's office. In this situation, the subjects' apprehension is understandable. Based on the results from the experiment, survey, and qualitative interviews, it seems valid to assert that interactivity truly would have a positive effect on relationalism with the following caveat: the seeker needs to feel comfortable interacting with the source. While subjects were comfortable interacting with websites, most were not comfortable interacting with the governor of a state 1500 miles away. In the survey, the interaction between seeker and source would be more natural as the respondent had selected a source to address a real task that had to be accomplished.

Customizability was also expected to have a positive relationship with relationalism. Customizability did exhibit the expected relationship in the experiment but not in the survey. Again the qualitative interviews shed some light on this discrepancy. In the experiment, customizability was implemented via three methods. First, subjects had the ability to toggle between tabular and graphic presentation modes. Second, subjects could change the color

schemes of the website. Third, subjects could set preferences, so they could get to certain pieces of information quickly and easily. In the follow-up interviews, subjects reported that they really liked the customizability features and that they had not seen features like that before on other websites.

In terms of the differences in the findings, customizability is representative of shared history. The sources of which the respondents were thinking in the survey could be sources they commonly used; as such, they may have developed a shared history with these sources such that the customizability features did not stand out in their minds when answering those survey items. In the experiment, subjects were explicitly exposed to those features and were made aware of them before they were given any tasks. Nevertheless, customizability would be most effective in relationship formation when the individual is not really aware that customization has occurred.

Additionally the experimental websites used a medium that specifically could be easily customized. Further, customizability was implemented via three different methods (see Table 69) in order to offer numerous methods for customization. In the survey where any source could be selected, the data showed that numerous different source types were selected (e.g. other individuals, books, websites, spreadsheets, special reports). The effects of customizability could have been masked amongst these different source types.

Differences were also seen in homophily. As discussed earlier, homophily as implemented in the experiment was ineffective. Subjects found things to like and dislike about the governor regardless of political affiliation. When the homophily scale was used which took into account the perceptions of the site being like the subject, that relationship was significant.

Homophily is representative of identifying with the source, and in the experiment, subjects identified with the sources, just not along political lines. Additionally, there is a temporal aspect to homophily as well. When interacting with others, everyone has met someone who was not as they initially appeared; viewed from this perspective, homophily can change across time as the relationship develops. Of all the antecedents, homophily provides the richest area for future research. This will be discussed in Section 9.4.

The last discrepancy occurred between the interactions for introversion. The follow-up qualitative interviews were not helpful in understanding the findings related to introversion. IRB restrictions prevented the researcher from being able to cross reference subjects to their data. One possible explanation for this discrepancy, however, could be due to sample size. Each group in the survey was comprised of over 200 individuals. Looking at the mean differences between conditions, strong extraverts used sources higher in relationalism by only 6%. Likewise strong allocentrics used sources only 2% higher in relationalism, and strong ideocentrics only used sources 5% lower in realationalism. Compare these percentages to introversion, which was significant in both the experiment and the survey, and strong introverts used sources 12% lower in relationalism. While significant differences were found, the sample sizes were so large that potentially trivial differences between groups could be significant.

9.2 Limitations of the Current Work

Before discussing the contributions of this work, any implications must be examined in light of the limitations inherent in this study. The two different methodologies minimize the biggest limitations of this work as each method addresses the shortcomings of the other. The experiment placed artificial demands upon the subjects, which was why a survey was used as well. Experiments are not very generalizable, but the survey results largely corroborate the

experimental findings. Conversely, although relationalism is unique to a particular source, the survey did not control for source. The experiment addresses this potential criticism and again largely corroborates the findings seen in the survey.

Nevertheless, there were discrepancies seen between the survey and the experiment. While the discussion of what caused these discrepancies was presented in Section 9.1.3, one should note that these explanations are merely educated conjectures. A small qualitative sample lends some support to the explanations offered to account for the discrepancies seen in interactivity and customizability. However, the differences seen in the data for introversion have no such additional data to explain why such disparity was observed.

Despite the discrepancies seen across the multiple methods, the overall research model is robust. The hypotheses were largely supported as expected. In turn the discrepancies offer multiple avenues for future research to further investigate the nomological network surrounding information search. One suggestion for future research would be to examine how relationalism develops across time with an explicit focus on how an individual's personality impacts the formation of a relationship between seeker and source.

Another limitation of this work is the cross sectional nature of the study. Nowhere is this limitation more apparent than in the discrepancy seen in the personality effects. How relationalism develops over time is not considered in this work; relationships between individuals evolve over time as the dyad shares common experiences. While this work has demonstrated the concept of relationalism, future research should investigate these research questions longitudinally. In the experiment in particular, the relationalism was based on a quickly formed relationship. As mentioned previously, individuals are often different than the way they first appear. It is no different with information sources. As an academic example, how

many well crafted abstracts have we read, only to find the paper itself lacking in some way? The websites used here were simple enough that discrepancies between initial impressions and long term impressions would be minimal. However, it would still be interesting to see if the relationship changes with repeated interactions with the source. Since interpersonal relationships evolve it is reasonable to argue that relationalism would evolve as well.

Another limitation is seen in the nonsignificant experimental results for homophily. In an attempt to manipulate homophily, the researcher did not explicitly consider the effects of how 19-23 year old undergraduates in central New York would feel about interacting with the governor of North Dakota. In the follow-up qualitative study, all subjects reported believing the sites were real. Also in pretesting, several testers asked the researcher if the sites were real. During pretesting this was taken as strong evidence that the experimental manipulations would work and that subjects would take the tasks seriously and behave accordingly. However, subjects' apprehension about communicating with a stranger was not explicitly considered. In retrospect, the experimental website content should probably have been more relevant to the subjects' day-to-day lives, particularly since trying to manipulate homophily via political content did not work.

9.3 Implications for Research

Despite the aforementioned limitations, this research does have quite a few implications for MIS research. Several implications for research were identified a priori in Chapter 1. This section will revisit these implications and identify others that were identified as this research project matured. An overview of study contributions are presented in Table 71 and further developed in the subsequent sections.

Finding	Implication
Relationalism was measured as a reliable and valid construct.	Relationalism would be useful for: • Incorporating into decision making models regarding information search. • Conceptualizing the benefits of using an information source. • Investigating the social processes inherent between seeker and information source.
Individuals select sources higher in relationalism.	Evolutionary processes have (Kock, 2004, 2009): • Predisposed individuals to prefer to interact with higher relationalism sources. • Source designers should take care to design high relationalism sources.
Different dimensions of task complexity differentially impacts the relationalism of a source selected.	Rather than looking at the requirements of a particular task, the basic task characteristics of: • Multiplicity • Uncertainty Should be the guiding principles when designing sources for users and consumers. The source should be consistent with the type of task it is being designed to support.
It is easier to form a relationship when a source perceived as similar.	Individuals are moving in ever more self selected circles where: • Conformity is viewed as a desirable selling point. • Similarity is based on Bayesian algorithms. • Similarity is driven by social relationships and tagging. Organizing based on homophily will continue unabated into the future. Business intelligence systems and machine learning rests on finding similarities in massive amounts of data, and an individual's interaction with an organization is going to be increasingly based on similarity.
Table 71. Review of study implications for research.	

Finding	Implication
Individuals prefer sources that exhibit social presence.	Internet communication technologies have advanced to the point where the concept of social presence is expected from users. To adequately capture the concept of presence an information source should exhibit: • Interactivity • Vividness • Customizability The concepts of interactivity and vividness should be updated to keep pace with the evolution of technology. This research represents an early foray of the idea of information sources being truly customizable, and as such offers new avenues for future research.

Table 71. Review of study implications for research.

9.3.1 Relationalism as a New Construct

The idea of a new relationalism construct was posited back in Chapter 1. In the ensuing pages, this idea was further developed, defined and rigorously tested across multiple sampling frames. Over the course of this document, theoretical arguments were made as to why it is reasonable to expect individuals to form relationships with information sources. While it is easy to assume that individuals can form relationships with an interpersonal information source, forming a relationship with an inanimate object (e.g., book or website) may initially seem impossible. It was argued from social exchange theory (Blau, 1964), anthropomorphization theory (Epley et al., 2007), and uncertainty theory (Berger & Calabrese, 1975) that not only is it possible for individuals to form relationships with inanimate objects, but that given the right antecedent conditions, a source designer can directly influence the probability that an individual would form a relationship with an information source. As such, clearly identifying the construct of relationalism can be considered a major contribution of this work.

In addition to identifying and defining the construct, a scale was developed to measure this construct. Scale development has been discussed in numerous disciplines in the social sciences, including seminal works in psychology (Loevinger, 1957), marketing (Churchill, 1979), and information systems (Moore & Benbasat, 1991). When developing the relationalism scale, the guidelines established in these earlier works were followed, but in addition to the rigorous development methods discussed in those works, this research took an additional step. Several disciplines, including marketing, psychology, HCI, communication, and information systems, were reviewed for existing constructs that seemed to be related to relationalism. Conducting this additional step and demonstrating that relationalism is unique from these related constructs lends further credibility to relationalism as a distinct construct.

Relationalism enhances the nomological network surrounding source selection in a couple of ways. First in accordance with economic theory, which posits selection as the result of a cost-benefit analysis, relationalism is a benefit inherent to a source in much the same way as accessibility is a cost. Prior to this study the cost-benefit tradeoff was seen as source accessibility versus information quality. Now the costs and benefits are tied strictly to the source which can help source designers develop sources individuals will tend to select. Before designers had to focus on making sources as accessible as possible[13] and hope the source contained high quality information, now designers can have a hand in impacting both the costs and the benefits of a source.

Secondly the social interaction view of source selection focuses primarily on the social processes involved when individuals interact with other individuals while communicating. At the time these theories were being developed inanimate sources high in relationalism were rare, but now they are much more commonplace. The concept of relationalism extends these theories into situations where the information source in question is no longer another individual.

9.3.2 Individuals prefer high relationalism sources

Relationalism demonstrated a clear relationship with source selection across both the experiment and the survey. This study demonstrated that in addition to considering the benefits of using a particular source and evaluating that source's information quality, individuals also take into account the relationalism of the source when choosing whether or not to use it. The social view of source selection argues that individuals prefer interpersonal sources and will

[13] Source designers should always design sources to be as accessible as possible. Just because a designer can directly impact source benefits does not mean designers should ignore the source costs.

select such sources over inanimate sources (Boyd & Fulk, 1996; Janet Fulk et al., 2004). By designing sources high in relationalism, designers can pique individuals' innate preference for interpersonal information sources, as sources' relationalism will enter into individuals' cost–benefit calculation during source selection.

In a post-relationalism world one avenue for future research includes developing a comprehensive model of source selection. Building on O'Reilly (O'Reilly, 1982) who argued that source, task and seeker characteristics are necessary to develop a selection model, this research identified relationalism as another important source characteristic. This work takes an important first step and argues that the process all information seekers go through is fundamentally the same—need, search, and finally use (Choo, 2006). This work differs from previous research into information seeking which treats every information need as unique. This has lead to many studies that examine the information seeking behaviors of a particular subset of individuals such as lawyers, engineers, doctors or nurses (Leckie, Pettigrew, & Sylvain, 1996). The focus is on how a certain type of sample searches for information whether the sample is high school students (Kuhlthau, 1991), academicians (Ellis, 1993), engineers (Gerstenberger & Allen, 1968), or medical researchers (J. D. Johnson, 1997). The underlying assumption being each population searches for information differently than the other. This work addresses that assumption and further discusses it in Section 9.3.3.

The implication from the finding that individuals prefer high relationalism sources is simple. Designers need to incorporate relationalism into the sources they provide to individuals. While this appears to be self evident, the moderation effects of the task on the selection process also need to be addressed.

9.3.3 Task complexity and relationalism

The importance of the task should be considered by developing a generalized model of search applicable to any individual using any source, applicable to a wide array of individuals and sources, needless redundancy is avoided. Currently without a unified model, researchers often investigate how one population or another search for information.

Ostensibly, the tasks a doctor does are quite different than those of an engineer. Another implication of this work stems from the way tasks are conceptualized. Rather than focusing on the outward behavioral mechanics of the task, it is argued that every task can be classified along various dimensions and it is these dimensions that influence the preference for high relationalism sources. In effect the drive for high relationalism sources is tempered by these task characteristics. Since all tasks fall into one of four basic types, then despite surface differences any task can be measured along these universal dimensions thereby revealing the underlying commonalities (D. J. Campbell, 1988). The surface differences are then immaterial in determining how an individual would select a source and it is meaningful to develop a model of source selection that is applicable to all different types of individuals.

By recognizing the commonalities among the tasks individuals engage in and how these generic task descriptions interact with individual's preference for higher relationalism sources, research can focus on developing sources that optimally suit the search needs for a given task type as opposed to describing how yet another sample searches for information. Following the reductionist view predominant in the search literature, the pattern of adding more and more models of how a different groups search for information can continue endlessly. It is more productive to focus on developing better sources to meet seeker's needs than endlessly developing models that describe behavior that can be grouped on their similarities.

9.3.4 Homophily and relationalism

Another contribution of this work relates to homophily. The unique method for implementing homophily and the potential benefits for doing so were discussed in Chapter 1. Research has clearly demonstrated that individuals self organize into clusters based on the similarities they have with other (Ingram & Morris, 2007; Lazerfeld & Merton, 1954). These self reinforcing circles of association are marketed as being beneficial on e-commerce sites, such as iTunes and Amazon. Some researchers have claimed that the time-saving benefits of having items already prescreened based on Bayseian algorithms designed to maximize the probability of completing a sales transaction are particularly beneficial in our attention-starved world swimming in information (Im & Hars, 2007; H.-N. Kim, Ji, Ha, & Jo); however, others have warned about the increasing polarization of society in which ideas are not cross pollinated and individuals are not exposed to divergent opinions (Hardy & Scheufele, 2009; Kwak et al., 2005; Mutz & Mondak, 2006).

It was expected that by creating website content consistent with conservative principles, homophily could be directly manipulated without having to rely on general proxies that can be unduly influenced by stereotypes (Brashears, 2008; Ingram & Morris, 2007). While direct political manipulation did not work, the perceptual measures of homophily did demonstrate a positive relationship with relationalism. Future work should investigate this discrepancy and try to understand what gives rise to feelings of homophily, so it can be leveraged purposefully in designing high relationalism sources. The findings in this study offer a rich avenue for future work, which will be further discussed in a subsequent section.

9.3.5 Social Presence and Relationalism

Social presence is defined as the perception of 'being there' in a mediated setting (Short et al., 1976). Operationalized in this research as interactivity, vividness and customizability these factors all contribute to the perception that an individual is interacting with another when using an information source. Since its original proposition, social presence has become intertwined with internet communication technologies (ICTs).

ICTs have changed greatly over the years as the underlying technology supports more features, increased bandwidth and generally allows for more information to be conveyed in less time. The majority of prior research has focused solely on enabling social presence in particular viewing interactivity as the number of things an individual can do to a source (Kiousis, 2002). This view was appropriate when ICTs were in their infancy, but now the marketplace is more mature. The underlying purpose of an information source is to communicate information; therefore, the degree to which a source accomplishes this task is how interactivity should be judged given that the technological underpinnings are inconsequential.

This research contributes by using a more relevant view of interactivity and how a source allows for and enhances communication between seeker and source. This conceptualization is more closely aligned with social presence, and as such represents a natural evolution from a time when concerns about the information processing power of a source directly impacted how interactive the source could be. Now with those concerns no longer relevant, the focus should shift to the interaction among communicating partners.

Additionally, this study uses a construct, customizability which is also another aspect of social presence. This is the ability of a source to communicate in a manner more suited to the communication partner. Just as an individual uses different methods of communication when

talking to their friends as opposed to their parents, customizability is a source's ability to transform itself to the needs of the individual.

Customizability has been discussed in prior works, but never in terms of designing information sources (Alpert et al., 2003; Wind & Rangaswany, 2001). As the experiment demonstrated, the ability to customize the information source leads to increased relationalism and eventually to increased selection of that source. Customization is an underutilized technique in current source development, one that needs further development. This work took important first steps in implemented it, but future work needs to further investigate customizability.

9.4 Opportunities for Future Research

This study can act as the starting point for several additional lines of inquiry. Drawing from the basic overview of the research model several opportunities for future research are suggested. An overview of these extensions rooted in the implications discussed above is shown in Figure 42.

Historically there have been two main theoretical perspectives on source selection, trait theories and social interaction theories (P. J. Carlson & Davis, 1998). Trait theories argue source selection to be determined by various traits the source and the requirements of the task. Social interaction theories argue that social influences impact source selection and individuals eventually ascribe characteristics to these sources which, in turn, influence source selection.

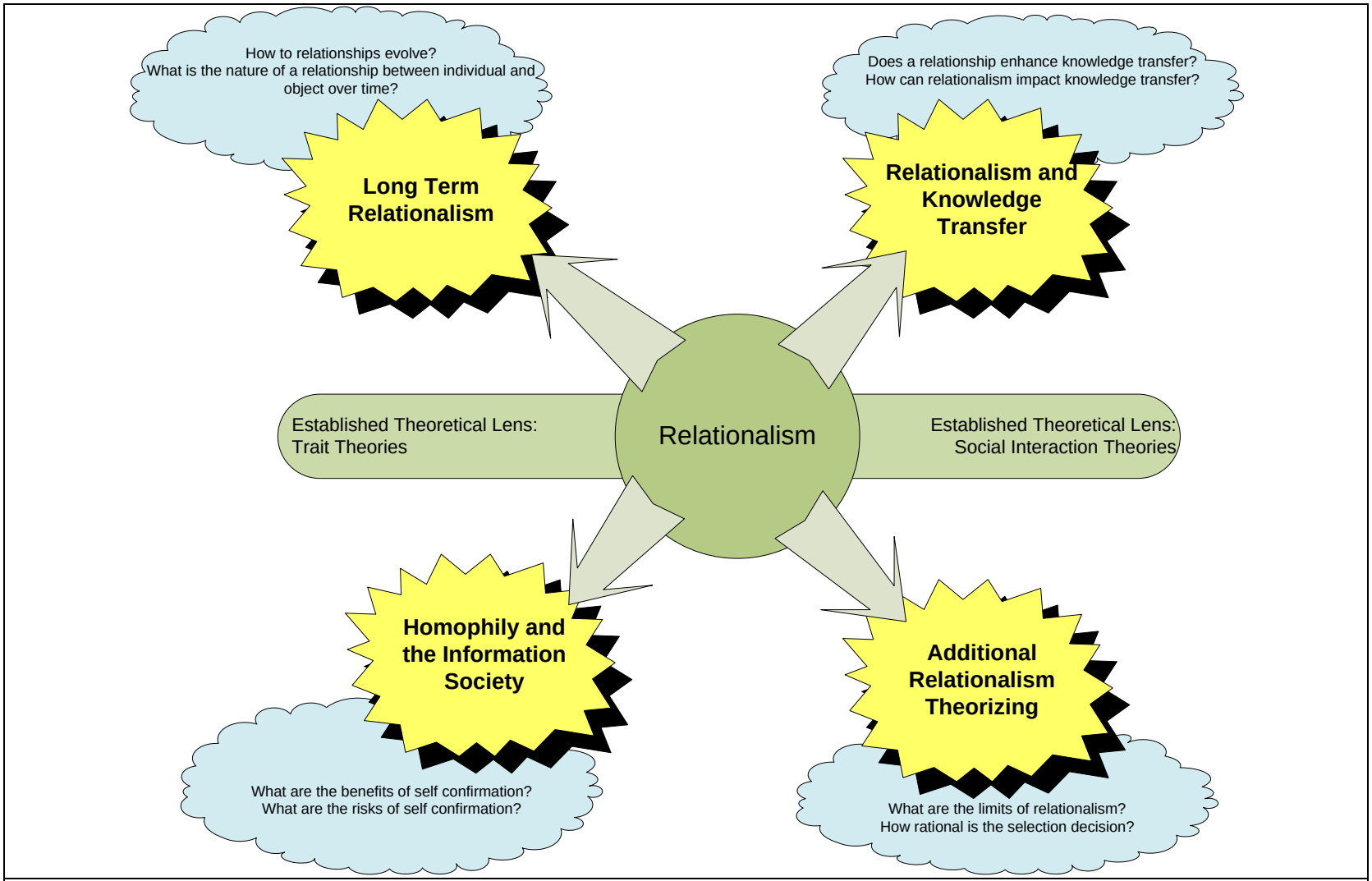


Figure 42. Agenda for future research.

As shown in Figure 42, relationalism crosses the trait and social interaction theoretical boundaries. Relationalism can be described as a trait and considered in terms of costs and benefits much like other established traits of selection such as information quality and accessibility. It is meaningful for an individual to consider the costs of maintaining a relationship against the benefits of maintaining a relationship when selecting a particular source. Relationalism also integrates with social interaction theories as well. Social interaction theories are all rooted in viewing communication as a dynamic web of interactions (J. Fulk et al., 1987). The basis for this perspective is meaning is socially constructed and results from the relationships that form between interacting partners. Relationalism is the perception of a relationship with a source. Inherent in this definition is the individual will create meaning on the basis of the information conveyed via the relationship she has with the source.

Extending from relationalism's bridging of trait and social interaction theories are four broad avenues for future research. First, there is room for additional theorizing about relationalism and the interplay between trait and social interaction theories. Second, future research should investigate how relationalism evolves over time. Third, future research should investigate the effect of repeated self selection and the polarization of information sources. Finally, future research should investigate how relationalism impacts knowledge transfer. Each of these along with potential research questions are further discussed in the following sections.

9.4.1 Additional Theorizing into Relationalism

Theory from Walther and Burgoon (1992) guided the development of the dimensions of relationalism. The concept of relationalism was based upon how individuals form relationships with each other and applied to an individual and information source, whether that source was person or object. Interpersonal relationships are typified by their complexity particularly when

the relationship has existed for quite some time. Relationalism extends this into a realm where individuals are potentially interacting with and forming relationships with inanimate objects. While this research largely supports the idea that individuals can and do form relationships with objects, what is unanswered is the limits of this extension of Walther and Burgoon's (1992) original theory. Future research should investigate the limits of relationalism (see lower right arm of Figure 42).

Additionally this research considers two dimensions that are relevant when forming relationships with information sources. Other research has endeavored to examine the totality of human interaction and have argued for as many as 12 different relationship dimensions (Burgoon & Hale, 1984). This work argues that information search is fundamentally a social process, but does not develop a formalized theory of information search. Subsequent research should build on the beginnings offered here and incorporate social processes into the cost benefit calculus individuals use in source selection with the goal being a formal theory of socialized information search. As discussed earlier, this work is the initial step toward a unified model of information search (see bottom right path in Figure 42). By drawing from a theory that looks at objective task characteristics to define complexity, what the actual task is becomes less important relative to how the task manifests the dimensions of complexity (D. J. Campbell, 1988). The goal of this work was to identify relationalism as a construct, not to develop a unified theory of source selection.

Future work should further develop how different groups select sources. By mapping tasks to the objective complexity dimensions and investigating the cognitive decision making processes individuals go through in selecting a source. There is unquestionably an element of cost benefit in selecting a source, and relationalism enriches the cost benefit decision making

the individual engages in when selecting an information source. The benefit to a relationship is it enhances information transfer, but relationships are not costless entities. Individuals have to invest in relationships to keep them functioning. The unintended costs of relationalism occurs when individuals continue to invest and use high relationalism sources and pay the relationship cost when it is not necessary for the information task should be investigated. It is well documented individuals are not rational decision makers (Simon, 1979), hence given the impact of relationalism on the selection process, would an individual make a less rational choice and select a higher relationalism source when the task conditions do not warrant such a selection? Only future work can adequately answer that question.

Furthermore, within the knowledge management literature, it is argued that a relationship between source and seeker is required for the transfer of knowledge (Ko et al., 2005; Levin & Cross, 2004) and that economic invectives are insufficient in motivating individuals to use knowledge management systems (Bock, Zmud, Kim, & Lee, 2005; Osterloh & Frey, 2000). In these studies, the relationship under investigation was between individuals; however, this work extends this concept to any information source instead of just interacting individuals. In addition, by demonstrating that individuals can form relationships with nonhuman sources, organizations can develop knowledge systems that are high in relationalism and distribute them to individuals within the organization.

In particular, wikis are tools ripe for further analysis in terms of relationalism, as they are information sources that allow open knowledge collaboration (Awazu & Desouza, 2004; Stvilia, Twidale, Smith, & Gasser, 2008) in which individuals are free to modify any entry. While recent research has investigated factors that lead an individual to contribute to a wiki (Yates, Wagner, & Majchrzak, 2010), what still needs to be researched is how individuals use wikis

when they need information and what patterns of usage and contribution exist. Wikis differ from online forums in that users can edit each other's information; hence, unless an audit trail is consulted, the content can possibly be in flux. While the editing abilities should lead to perceptions of higher relationalism, how it such editing impacts perceptions of quality is another matter. The MIS field should embrace relationalism and its inherent usefulness and heed the call of Kane and Fichman (2009) and further investigate how individuals form relationships with information sources.

9.4.2 Relationalism and Knowledge Transfer

Where relationalism could play an important role in knowledge management, a KMS that only has knowledge flowing into it is not particularly useful. Knowledge transfer has at its core connection instead of collection. Relationalism is about the connection between seeker and source. From this perspective this research would agree with the argument that knowledge flows along relationship lines (M. S. Clark & Mills, 1993). Again the relationships in prior work all revolved around individuals interacting with each other. By arguing that individuals can form a relationship with an inanimate object adds a layer of complexity not seen in these earlier works. While this claim is theoretically grounded (Berger & Calabrese, 1975; Blau, 1964; Epley et al., 2007; Walther & Burgoon, 1992) and empirically supported in this work there is still several avenues for future research regarding knowledge transfer and relationalism.

Knowledge management systems aid in the transfer of knowledge (McCall, Arnold, & Sutton, 2008). As stated previously while it is a noble goal to capture the organization's knowledge, unless that knowledge is transferred to the individual who requires it is, the system is ineffective. Future work into knowledge management and knowledge transfer should investigate the effects of how a relationship enhances knowledge transfer (see top right arm of

Figure 42). Early work has demonstrated that a KMS is more effective at knowledge transfer than traditional information sources (Ringberg & Reihlen, 2008). The KMS in that study was one that was a low relationalism source. Future work should investigate how a high relationalism source can potentially enhance and impact transfer, in essence investigating the efficacy of relationalism in transferring knowledge (see upper right arm of Figure 42).

Another area for future research is to study the development of relationalism over time. While trust relationships can form very quickly in goal oriented settings (Meyerson, Weick, Kramer, & Tyler, 1996), it is reasonable to assume based on this and the findings in the experiment, that perceptions of relationalism can form quickly as well. Future work should investigate how relationalism changes over time. Relationships develop, and it is expected that relationalism would evolve over time as well. The results of this longitudinal study would contribute to a theory of socialized information search that would complement the cost benefit analyses individuals currently engage in when selecting a source.

The antecedents would play a crucial role in this longitudinal study. Does the nature of the relationship between the antecedents vary across time? For example in the experiment subjects could customize the site to their liking. These preferences will remain in effect until changed again. Over time and with repeated use and individual might forget they customized that page. Hence as the relationship between seeker and source develops customizability might be less important than at the beginning. Without a longitudinal analysis this is pure conjecture.

9.4.3 Homophily and the Information Society

With regards to the relationalism antecedents, future research should further investigate the effects of homophily. While it is well documented that individuals self organize into groups of similar others (Ingram & Morris, 2007), the effects of consistently consulting

homophilous information is not well understood. Websites use this as a strong selling point (Im & Hars, 2007; H.-N. Kim, Ji, Ha, & Jo, 2008), but the long term impact of never having one's beliefs challenged is unknown (see bottom left arm in Figure 42).

When Simon (1971, pp. 40-41) wrote "...in an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it" he could scarcely have imagined the degree to which attention has become such a rare commodity today. Individuals modify their behavior to conserve scarce resources (Becker, 1976). Technology has come to the aid of individuals with the simplification of interfaces and reducing communications latencies essentially to zero; both of these conserve time for users. The same motive has also spawned a plethora of indexing and searching schemes, of which Google is the chief example. These are all seeking to be attention-optimizers.

In addition to these technological innovations, collaborative filtering is another way to conserve attention. Collaborative filtering techniques rely on advanced mathematical techniques—Bayesian algorithms, Markov decision models, clustering models—but a simpler and potentially more effective method lies in the collective wisdom of groups. A "folksonomy" where others tag information for others to later find is a relatively new development in the information search area. Recent work into folksonomies has shown that consensus around stable distributions and shared vocabularies does emerge, even in the absence of a central controlled vocabulary (Halpin, Robu, & Shepherd, 2007).

Is increasingly polarized information society a symptom or a result of millions of individuals trying to conserve attention? Further, what is the result of the narrowing of the intellectual vision that comes with constantly having ones opinions reaffirmed and never challenged? Moving in self referent circles reduces the serendipity that has been the source of most radical innovation of the past, when brilliant minds studied concepts for hours before gaining their important insights. President Obama spoke to this at a recent commencement address when he said, "…you're coming of age in a 24/7 media environment that bombards us with all kinds of content and exposes us to all kinds of arguments, some of which don't always rank that high on the truth meter. And with iPods and iPads; and Xboxes and PlayStations — none of which I know how to work; information becomes a distraction, a diversion, a form of entertainment, rather than a tool of empowerment, rather than the means of emancipation. So all of this is not only putting pressure on you; it's putting new pressure on our country and on our democracy." In an information glut, deciding where to spend attention is critical. Future research needs to investigate the consequences of long term self confirmation in ones opinions and attitudes. Future research should investigate both the benefits and risks of continual affirmation from the information one seeks. Does it lead to lessened objectivity and increased intolerance from divergent viewpoints?

9.4.4 Long term relationalism

The final avenue for future research is longitudinal. Both the experiment and survey in this work was cross sectional and only considered an interaction with a single source at a single time. Future work (see top left arm in Figure 42) should investigate how relationalism evolves across time. The social interaction view of source selection explicitly argues that relationships do change over time (Janet Fulk et al., 2004; J. Fulk et al., 1987). Within the interpersonal realm

relationships change over time (Altman & Taylor, 1973), so it stands to reason that an individual's relationship with a source should also change as well. The nature of this change (or if it is even true) is unknown at this time.

Relationalism is inherent within any source, but forming a relationship involves a certain time investment with an information source. The results of the experiment demonstrate that individuals can form a relationship with a source quickly, much like individuals can learn to trust one another quickly (Jarvenpaa, Knoll, & Leidner, 1998). Future research should investigate how the relationship between a seeker and a source evolves over time (see upper left arm of Figure 42). In particular, when an object with high relationalism is involved does the relationship grow to a point and remain steady or does it change more like an interpersonal relationship? How does the relationship between seeker and source evolve over time and what is the nature of that relationship? Only additional research can answer these questions.

9.5 Implications for Practice

This research has several implications for managers working in organizations that provide information sources either for their employees or customers. In Chapter 1, it was suggested that by providing high relationalism sources organizations could enable or enhance existing social structures, thereby increasing the spread of organizational knowledge. The findings from this research can help managers attain this goal. Table 72 reviews the findings of this research and draws implications for managers.

Result	Implication
Mean differences in the amount of relationalism for sources selected versus those not selected	When designing new information sources, designers should carefully consider the: • Relationalism Of these new information source. Doing so will lead to greater acceptance and usage of the new source.
Relationalism can be directly manipulated via interactivity, vividness and customizability	When an organization decides to implement a new instance of a particular source, these elements directly correspond to: • The ability of a source to support interactive communication. • The ability of the source to adequately convey the information in a reasonable time frame. • The ability of the source to mimic interpersonal communication. Considering these factors can yield a knowledge system (in an extreme case) like IBM's Watson.
Individuals can form a relationship with information sources	Organizations can use individuals' inherent tendencies to form relationships in order to • Engage in impression management (e.g. BP's oil spill cleanup efforts). • Increase knowledge management initiatives where by users share their knowledge for later reuse.
Table 72. Implications for practice.	

Since future information sources that organizations will provide to their users are likely to be web-based, the experimental results are particularly germane to this discussion. Knowledge management systems should be designed with relationalism in mind and should inherently support relationship formation. In addition to making the sites interactive, vivid, and customizable, other relationship cues, such as the originating provider, can be incorporated as well (Durcikova & Gray, 2009).

This work also has implications for managers involved in organizational impression management. With individuals able to find out more about an organization much faster and easier than ever before, the face an organization portrays to the outside world becomes critical, and relationalism can be a portion of organizational impression management.

Impression management has been defined as the process whereby individuals attempt to control the images that are projected in real or imagined social situations (Leary & Kowalski, 1990). Research has identified many ways in which individuals try to control the image they present, and many of these findings are relevant to how an organization can do the same. Explicitly drawing from the findings of this study where perceptions of relationalism are the result of interactivity, vividness, customizability and homophily, organizations should take these into account when designing materials for consumers. Three formal points of contact are investing prospectuses, annual reports and organizational websites. The organization can design these sources with relationalism in mind.

Since modern organizations are large complex entities, the amount of information they have to present can be overwhelming. This is an aspect of multiplicity, and as this research demonstrates individuals would rather use a high relationalism source when faced with a

multiplicitous task. By building a relationship with consumers, organizations can provide enhanced value to consumers.

Since relationships develop over time, this also benefits the organization in that switching costs develop. An individual through the relationship relies on the organization and will depend on the information the organization provides. Remembering that both multiplicity and uncertainty positively moderate the relationalism selection relationship, an individual will be even less likely to find a different source for their information needs.

It is also important to remember that the control variable, information quality, also plays a role in source selection. When it comes to purchasing, decisions are often based on perceptions and predictions of product quality. These judgments are in turn dependent on product attributes and their relation to the potential utility a consumer may derive from that product. It is often an unwieldy task for consumers to process all the available attribute information. As a result, consumers often rely on simple decision-making strategies when evaluating products. For example, consumers may infer from a product's price that its physical attributes are of higher quality (since the underlying assumption is that the inputs to production may be more expensive). Alternately, consumers may consider a brand name as an umbrella concept under which various attributes are assumed to accompany the product. This is part of the role relationalism in the decision making process. By forming a relationship with the consumer, one of the potential benefits is increased brand loyalty. Consequently, consumers often use brand or price information in making product assessments and, as such, this attention to brand and price information may inhibit the use of other information in judging a product's quality (Oxoby & Finnigan, 2007).

Managers should remember that relationalism is real and plays a role in source selection. Individuals can and do form relationships with information sources. This study demonstrated that individuals do prefer sources higher in relationalism. This finding, while not particularly exciting in and of itself, lays the groundwork for the impact of the relationalism complexity interaction. Managers need to take into account the type of tasks a system is designed to support when building new information systems. Since all tasks can be described in terms of multiple paths, multiple outcomes, conflicting interdependencies and probabilistic linkages (D. J. Campbell, 1988), any organization that endeavors to provide information sources for its users can draw upon this work to help in building the information system.

Lastly, though relationalism can be viewed as a benefit to using a particular source, it should not be viewed as a replacement for other source benefits, particularly information quality. Individuals need high quality information if the decisions they make are to be beneficial to the organization. Relationalism should be used to encourage individuals to select a given source over another. It should not be used apart for other source benefits.

9.6 Conclusion

This dissertation proposed and developed a new construct called relationalism. This construct grew out of the finding that while accessibility is a key driver of source selection (O'Reilly, 1982), when it comes to interpersonal sources, accessibility is less important (Zimmer et al., 2008). This work surmised that accessibility was less important for interpersonal sources due to the relationship that developed between the interacting individuals. Relationalism as a construct was proposed, defined, developed, and situated in a nomological network. As theorized, relationalism exhibits a positive relationship with source selection, though this preference is tempered by the task in which an individual is involved.

This dissertation offers new avenues for future research into source selection. Answering the question of how individuals relate to information sources is important to MIS researchers who can then share the results of these studies with organizations that provide sources to their users. It is hoped that future work will expand upon this with the goal being a comprehensive model of source selection.

Appendices

Appendix A: Experiment 1 Scales

Please choose the item which best reflects your political values.				
Very conservative	conservative	moderate	liberal	Very liberal

Subjects complete the above question one time.

	Thinking about the source you just viewed, please indicate your level of agreement or disagreement with each of the items below.	strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree
Interactivity	This source allows non-concurrent communication							
	This source enables two-way communication							
	This source enables concurrent communication							
	This source enables conversation							
	This source is interactive							
	This source is interpersonal							
	This source is primarily for one-way communication							
Relationalism	Using this source was like talking to another person							
	I felt like I was having a conversation when using this source							
	I felt like this source listened to me							
	I felt like this source liked me as a person							
	This source was unresponsive to my needs							
	This is a trustworthy source							
	I felt like this was a reasonable source							
Vividness	The content on this source is animated							
	The content on this source is lively							
	I can acquire information from this source using different sensory channels							
	This source contains information exciting to the senses							
Customizability	This source can adapt its presentation to meet my needs							
	The arrangement of this source is made especially for me							
	This source can be tailored to fulfill my information requirements							
	This source provides a variety of content that I can modify to achieve my goals							
	This source is customizable							

Subjects complete the above items after each of the 4 websites they view.

Below are a set of 4 polar opposite phrases. Continuing to think of the source just viewed; please indicate where you stand on these continuums.									
Homophily	This website does not think like me								This website thinks like me
	This website behaves like me								This website does not behave like me
	This website is similar to me								This website is different from me
	This website is unlike me								This website is like me

Subjects complete the above items after each website they view.

Appendix B: Experiment 2 Scales

Please indicate how strongly you agree or disagree with the following statements	strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree
1. I feel tense when I'm with people I do not know well							
2. When speaking with others, I worry about saying something dumb							
3. I have trouble looking someone in the eyes							
4. I like to be with people							
5. I welcome the opportunity to mix socially with people							
6. I would be unhappy if I were prevented from making many social contacts							
7. I feel good when I cooperate with others							
8. If a coworker gets a prize, I would feel proud							
9. It is important to me to respect the decisions made by my groups							
10. The wellbeing of my coworkers is important to me							
11. I often "do my own thing"							
12. I rely on myself most of the time; I rarely rely on others							
13. I'd rather depend on myself than others							
14. It is important that I do my job better than others							
Items 1-3: Introversion Items 4-6: Extraversion Items 7-10: Allocentrism Items 11-14: Ideocentrism							

Subjects complete the above items once.

Thinking about the source you just viewed, please indicate your level of agreement or disagreement with each of the items below.		strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree
Relationalism	Using this source was like talking to another person							
	I felt like I was having a conversation when using this source							
	I felt like this source listened to me							
	I felt like this source liked me as a person							
	This source was unresponsive to my needs							
	This is a trustworthy source							
	I felt like this was a reasonable source							

Subjects complete the above items after each website.

While thinking of the task you entered in the box above, please indicate your level of agreement (or disagreement) with the following statements.	strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree
1. There is a considerable amount of information that needs to be processed in order to complete the task							
2. I am dealing with an unstructured business problem							
3. There are large numbers of subtasks requiring specific knowledge and skills that must be carried out to perform the major task							
4. I am dealing with an ad-hoc, non-routine business problem							
5. There are quite a large number of steps required to complete this task							
6. I am working on an unpredictable task							
Odd numbered items: Multiplicity Even numbered items: Uncertainty							

Subjects complete the above items after they are presented with the experimental task

Which website would you like to use to complete the task you were just given?				
First site	Second site	Third site	Fourth site	Fifth site

Appendix C: Survey Scales

This appendix shows the full survey respondents completed for this project.

1. What is your gender? Male/Female
2. Do you currently work full time? Yes/No
3. How old were you on your last birthday? _____
4. What is your job title? _____
5. How many years have you been at your current employer? _____
6. I would describe my primary job duties as: Clerical/ Technical/ Managerial
7. Approximately how many people work in your organization at the same location as you? 1-250/ 251-500/ 501-750/ 751-1000/ 1000 or more
8. How many people work in your department at your location? _____
9. Approximately how many coworkers do you communicate with on a typical day? _____

I routinely need to find information to do my job.							
Please indicate how strongly you agree or disagree with the following statements	strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree
1. I feel tense when I'm with people I do not know well							
2. When speaking with others, I worry about saying something dumb							
3. I have trouble looking someone in the eyes							
4. I like to be with people							
5. I welcome the opportunity to mix socially with people							
6. I would be unhappy if I were prevented from making many social contacts							
7. I feel good when I cooperate with others							
8. If a coworker gets a prize, I would feel proud							
9. It is important to me to respect the decisions made by my groups							
10. The wellbeing of my coworkers is important to me							
11. I often "do my own thing"							
12. I rely on myself most of the time; I rarely rely on others							
13. I'd rather depend on myself than others							
14. It is important that I do my job better than others							
Items 1-3: Introversion Items 4-6: Extraversion Items 7-10: Allocentrism Items 11-14: Ideocentrism							

Respondents saw only ***one*** of the following sets of instructions.	
HIHI	The rest of this survey deals with the information sources you choose to use when you need additional information to accomplish your work tasks. Since you probably work on many different tasks during the day, I need you to think of a single specific task that you have recently worked on. In particular you should think of a task that has many steps and no clear cut solution. An example of this type of task would be deciding on the features to include in an entire product line and how to price those products. In the box below briefly describe the task you are thinking of:
HILO	The rest of this survey deals with the information sources you choose to use when you need additional information to accomplish your work tasks. Since you probably work on many different tasks during the day, I need you to think of a single specific task that you have recently worked on. In particular you should think of a task that does not have too many pieces but that has no clear cut solution. An example of this type of task would be trying to predict the value of a stock one year into the future. In the box below briefly describe the task you are thinking of.
LOHI	The rest of this survey deals with the information sources you choose to use when you need additional information to accomplish your work tasks. Since you probably work on many different tasks during the day, I need you to think of a single specific task that you have recently worked on. In particular you should think of a task that has lots of things to attend to, but all aspects have a clear cut solution. For example a task that has several component parts is finding total revenues for fiscal year 2008 for the ten largest organizations in the automotive, pharmaceutical, oil, construction and fashion industries. In the box below briefly describe the task you are thinking of.
LOLO	The rest of this survey deals with the information sources you choose to use when you need additional information to accomplish your work tasks. Since you probably work on many different tasks during the day, I need you to think of a single specific task that you have recently worked on. In particular you should think of a relatively simple task, one that does not have too many steps and has a clear cut solution. For example you might need to know the total 2009 revenues for a particular organization or you might need to know how to set a date format in Microsoft excel. In the box below briefly describe the task you are thinking of.

While thinking of the task you entered in the box above, please indicate your level of agreement (or disagreement) with the following statements.	strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree
1. There is a considerable amount of information that needs to be processed in order to complete the task							
2. I am dealing with an unstructured business problem							
3. There are large numbers of subtasks requiring specific knowledge and skills that must be carried out to perform the major task							
4. I am dealing with an ad-hoc, non-routine business problem							
5. There are quite a large number of steps required to complete this task							
6. I am working on an unpredictable task							
Odd numbered items: Multiplicity Even numbered items: Uncertainty							

When faced with a task where additional information is required to adequately address the task, you have a wide array of potential information sources. I would like for you to think of two sources--one that you did not use when you worked on the task you described above and a second source that you did use when you worked on the task above. First, think of the source you did **NOT** use in accomplishing the task above. This source can be anything that potentially could have provided you with the information you needed to complete the task above such as a book, another person, a website, a journal, anything. Think of the source that actually could have given you the information you required, do not think of sources that sends you to other sources (such as google or other search engines). In the box below write in the source you are thinking of. If you are thinking of another person also include their relationship to you (supervisor, colleague, coworker in my department, friend, mentor, etc.). Lastly, please do not think of a source that the reason you didn't use it was because you could not get to it. Think of a source that you could legitimately access, but chose not to use it.
What source are you thinking of? Please be specific. If it is a book, put the name of the book. If it is a person, put their name. I want you to have a clear mental image of a specific source. Again, please do not think of search engines such as Google, Yahoo, Bing etc.
If you are thinking of another individual, what is their relationship to you? If you are not thinking of a person, leave this question blank.

While thinking of the source you **DID NOT USE** please indicate your level of agreement (or disagreement) with the following statements.		strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree
Interactivity	This source allows non-concurrent communication							
	This source enables two-way communication							
	This source enables concurrent communication							
	This source enables conversation							
	This source is interactive							
	This source is interpersonal							
	This source is primarily for one-way communication							
Relationalism	Using this source was like talking to another person							
	I felt like I was having a conversation when using this source							
	I felt like this source listened to me							
	I felt like this source liked me as a person							
	This source was unresponsive to my needs							
	This is a trustworthy source							
	I felt like this was a reasonable source							
Vividness	The content on this source is animated							
	The content on this source is lively							
	I can acquire information from this source using different sensory channels							
	This source contains information exciting to the senses							
Customizability	This source can adapt its presentation to meet my needs							
	The arrangement of this source is made especially for me							
	This source can be tailored to fulfill my information requirements							
	This source provides a variety of content that I can modify to achieve my goals							
	This source is customizable							

Below are a set of 4 polar opposite phrases. Continuing to think of the source you **DID NOT USE**, please indicate where you stand on these continuums.									
Homophily	This source does not think like me								This source thinks like me
	This source behaves like me								This source does not behave like me
	This source is similar to me								This source is different from me
	This source is unlike me								This source is like me

Below are a set of 4 polar opposite phrases. Continuing to think of the source you **DID NOT USE**, please indicate where you stand on these continuums.									
accessibility	Inconvenient								Convenient
	Available								Unavailable
	Dependable								Undependable
	inaccessible								Accessible

	While thinking of the source you **DID NOT USE** please indicate your level of agreement (or disagreement) with the following statements.	strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree
Usability	I would probably use this source in the future							
	I do not ever intend to use this source							
	I would like to use this source							
	This source is among my favorites							
	Using this source allows me to accomplish tasks more quickly							
	Using this source enhances my effectiveness on the job							
	Using this source improves my job performance							
	Using this source makes it easier to do my job							
	Using this source increases my productivity							
	Overall, I find using this source to be advantageous in doing my job							
Quality	This source is clear in meaning							
	This source is easy to comprehend							
	This source is accurate							
	This source is credible							
	This source is informative							
	This source is valuable							

I want you to keep thinking of the task you entered earlier, but I would like for you to think of the source that you **did use** when you worked on that task. Think of the source you did use in accomplishing the task above. This source can be anything that potentially could have provided you with the information you needed to complete the task above such as a book, another person, a website, a journal, anything. Think of the source that actually could have given you the information you required, do not think of sources that send you to other sources (such as Google or other search engines). In the box below write in the source you are thinking of. If you are thinking of another person also include their relationship to you (supervisor, colleague, coworker in my department, friend, mentor, professor, etc.)
What source are you thinking of? Please be specific. If it is a book, put the name of the book. If it is a person, put their name. I want you to have a clear mental image of a specific source. Again, please do not think of search engines such as Google, Yahoo, Bing etc.
If you are thinking of another individual, what is their relationship to you? If you are not thinking of a person, leave this question blank.

While thinking of the source you **DID USE** please indicate your level of agreement (or disagreement) with the following statements.		strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree
Interactivity	This source allows non-concurrent communication							
	This source enables two-way communication							
	This source enables concurrent communication							
	This source enables conversation							
	This source is interactive							
	This source is interpersonal							
	This source is primarily for one-way communication							
Relationalism	Using this source was like talking to another person							
	I felt like I was having a conversation when using this source							
	I felt like this source listened to me							
	I felt like this source liked me as a person							
	This source was unresponsive to my needs							
	This is a trustworthy source							
	I felt like this was a reasonable source							
Vividness	The content on this source is animated							
	The content on this source is lively							
	I can acquire information from this source using different sensory channels							
	This source contains information exciting to the senses							

While thinking of the source you **DID USE** please indicate your level of agreement (or disagreement) with the following statements.		strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree
Customizability	This source can adapt its presentation to meet my needs							
	The arrangement of this source is made especially for me							
	This source can be tailored to fulfill my information requirements							
	This source provides a variety of content that I can modify to achieve my goals							
	This source is customizable							

Below are a set of 4 polar opposite phrases. Continuing to think of the source you **DID USE**, please indicate where you stand on these continuums.									
homophily	This source does not think like me								This source thinks like me
	This source behaves like me								This source does not behave like me
	This source is similar to me								This source is different from me
	This source is unlike me								This source is like me

Below are a set of 4 polar opposite phrases. Continuing to think of the source you **DID USE**, please indicate where you stand on these continuums.									
accessibility	Inconvenient								Convenient
	Available								Unavailable
	Dependable								Undependable
	inaccessible								Accessible

	While thinking of the source you **DID USE** please indicate your level of agreement (or disagreement) with the following statements.	strongly disagree	disagree	slightly disagree	neutral	slightly agree	agree	strongly agree
Usability	I would probably use this source in the future							
	I do not ever intend to use this source							
	I would like to use this source							
	This source is among my favorites							
	Using this source allows me to accomplish tasks more quickly							
	Using this source enhances my effectiveness on the job							
	Using this source improves my job performance							
	Using this source makes it easier to do my job							
	Using this source increases my productivity							
	Overall, I find using this source to be advantageous in doing my job							
Quality	This source is clear in meaning							
	This source is easy to comprehend							
	This source is accurate							
	This source is credible							
	This source is informative							
	This source is valuable							

References

Aarts, H., Verplanken, B., & van Knippenberg, A. (1998). Predicting Behavior from Actions in the Past: Repeated Decision Making or a Matter of Habit?, *Journal of Applied Social Psychology* (Vol. 28, pp. 1355-1374).

Aggarwal, P., & McGill, A. L. (2007). Is that car smiling at me? Schema congruity as a basis for evaluating anthropomorphized products. *Journal of Consumer Research, 34*(4), 468-479.

Agheyisi, R., & Fishman, J. A. (1970). Language Attitude Studies: A Brief Survey of Methodological Approaches. *Anthropological Linguistics, 12*(5), 137-157.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Allen, T. J. (1984). *Managing the Flow of Technology*. Cambridge, MA: MIT Press.

Alpert, S. R., Karat, J., Karat, C.-M., Vergo, J. G., & Brodie, C. (2003). User Attitudes Regarding a User-Adaptive eCommerce Web Site. *User Modeling and User-Adapted Interaction, 13*(4), 373-396.

Altman, I., & Taylor, D. A. (1973). *Social Penetration: The Development of Interpersonal Relationships*. New York, NY: Holt, Rinehart & Winston.

Amichai-Hamburger, Y., Kaplan, H., & Dorpatcheon, N. (2008). Click to the past: The impact of extroversion by users of nostalgic websites on the use of internet social services. *Computers in Human Behavior, 24*(5), 1907-1912.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411-423.

Antheunis, M. L., Valkenburg, P. M., & Peter, J. (2007). Computer-Mediated communication and interpersonal attraction: An experimental test of two explanatory hypotheses. *CyberPsychology & Behavior, 10*(6), 831-835.

Armstrong, J. S., & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research, 14*(3), 396-402.

Awazu, Y., & Desouza, K. C. (2004). Open knowledge management: Lessons from the open source revolution. *Journal of the American Society for Information Science & Technology, 55*(11), 1016-1019.

Barki, H., Titah, R., & Boffo, C. l. (2007). Information System Use--Related Activity: An Expanded Behavioral Conceptualization of Individual-Level Information System Use. *Information Systems Research, 18*(2), 173-192.

Barrick, M. R., & Mount, M. K. (1991). The Big Five Persnality Dimensions and Job Performance: A Meta-Analysis. *Personnel Psychology, 44*(1), 1-26.

Becker, G. S. (1976). *The Economic Approach to Human Behavior*. Chicago, IL: University of Chicago Press.

Belkin, N. J., Marchetti, P. G., & Cool, C. (1993). Braque: design of an interface to support user interaction in information retrieval, *Information Processing & Management* (Vol. 29, pp. 325-344).

Beniger, J. R. (1987). Personalization of mass media and the growth of pseudo-community. *Communication Research, 14*(3), 352-371.

Bentler, P. M. (1995). *EQS Structural Equations Program Manual*. Encino, CA: Multivariate Software, Inc.

Berger, C. R. (1979). Beyond Initial Interaction: Uncertainty, Understanding, and the Development of Interpersonal Relationships. In H. Giles & R. N. St. Clair (Eds.), *Language and Social Psychology* (pp. 122-144). Oxford, UK: Basil Blackwell.

Berger, C. R., & Calabrese, R. J. (1975). Some Explorations in Initial Interaction and Beyond: Toward a Developmental Theory of Interpersonal Communication. *Human Communication Research, 1*(1), 99-112.

Blair, E., & Zinkhan, G. M. (2006). Nonresponse and Generalizability in Academic Research. *Journal of the Academy of Marketing Science, 34*(1), 4-7.

Blau, P. M. (1964). *Exchange and Power in Social Life*. Mahwah, NJ: Lawrence Erlbaum.

Blinder, A. S., & Morgan, J. (2005). Are Two Heads Better than One? Monetary Policy by Committee. *Journal of Money, Credit, and Banking, 37*(5), 789-812.

Bock, G.-W., Zmud, R. W., Kim, Y.-G., & Lee, J.-N. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. *MIS Quarterly, 29*(1), 87-111.

Bollen, K. A. (1989). *Structural equations with latent variables*. New York: John Wiley and Sons.

Bonebrake, K. (2002). College students' Internet use, relationship formation, and personality correlates. *CyberPsychology & Behavior, 5*(6), 551-557.

Bos, N., Gergle, D., Olson, J. S., & Olson, G. M. (2001). *Being there versus seeing there: Trust via video.* Paper presented at the Proceedings of Human Factors in Computing Systems.

Bowlby, J. (1982). *Attachment and Loss: Volume 1* (2nd ed.). New York, NY: Basic Books.

Boyd, B. K., & Fulk, J. (1996). Executive scanning and perceived uncertainty: A multidimensional model. *Journal of Management, 22*(1), 1-21.

Brashears, M. E. (2008). Gender and homophily: Differences in male and female association in Blau space. *Social Science Research, 37*(2), 400-415.

Breazeal, C. (2003a). Emotion and Sociable Humanoid Robots. *International Journal of Human Computer Studies, 59*(1), 119-155.

Breazeal, C. (2003b). Toward Sociable Robots. *Robotics and Autonomous Systems, 42*(3-4), 167-175.

Brewer, M. B. (1979). In-group Bias in the Minimal Intergroup Situation: A Cognitive-Motivational Analysis. *Psychological Bulletin, 86*(2), 307-324.

Brewer, M. B. (1991). The Social Self: On Being the Same and Different at the Same Time. *Personality and Social Psychology Bulletin, 17*(5), 475-482.

Brewer, M. B., & Chen, Y.-R. (2007). Where (Who) Are Collectives in Collectivism? Toward Conceptual Clarification of Individualism and Collectivism. *Psychological Review, 114*(1), 133-151.

Brown, J. S., & Duguid, P. (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization Science, 2*(1), 40-57.

Brush, T. H., & Artz, K. W. (1999). Toward a Contingent Resource-Based Theory: The Impact of Information Asymmetry on the Value of Capabilities in Veterinary Medicine. *Strategic Management Journal, 20*(3), 223-250.

Bull, P. (1983). *Bodily Movement and Interpersonal Communication*. Chichester, NY: John Wiley & Sons Ltd.

Bull, P., & Rumsey, N. (1988). *The Social Psychology of Facial Appearance*. New York, NY: Springer-Verlag.

Burgoon, J. K. (1994). Nonverbal Signals. In M. L. Knapp & G. R. Miller (Eds.), *Handbook of Interpersonal Communication* (pp. 229-285). Thousand Oaks, CA: Sage Publications.

Burgoon, J. K., Bonito, J. A., Bengtsson, B., Cederberg, C., Lundeberg, M., & Allspach, L. (2000). Interactivity in human-computer interaction: A study of credibility, understanding, and influence. *Computers in Human Behavior, 16*(6), 553-574.

Burgoon, J. K., & Hale, J. L. (1984). The Fundamental Topoi of Relational Communication. *Communication Monographs, 51*(3), 193-214.

Burgoon, J. K., & Hale, J. L. (1987). Validation and Measurement of the Fundamental Themes of Relational Communication. *Communication Monographs, 54*(1), 19-41.

Burgoon, J. K., & Le Poire, B. A. (1999). Nonverbal cues and interpersonal judgments: Participant and observer perceptions of intimacy, dominance, composure, and formality. *Communication Monographs, 66*(2), 105-124.

Burke, R. R. (1996). Virtual Shopping: Breakthrough in Marketing Research. *Harvard Business Review, 74*(2), 120-131.

Byrne, B. M. (2008). *Structural Equation Modeling with EQS: Basic Concepts, Applications and Programming* (2nd ed.). New York, NY: Routledge & Taylor.

Byrne, B. M., & Stewart, S. M. (2006). The MACS Approach to Testing for Multigroup Invariance of a Second-Order Structure: A Walk Through the Process. *Structural Equation Modeling, 13*(2), 287-321.

Byström, K., & Järvelin, K. (1995). Task Complexity Affects Information Seeking and Use. *Information Processing and Management, 31*(2), 191-213.

Calabuig, V., & Olcina, G. (2009). Cooperation and cultural transmission in a coordination game. *Journal of Economic Behavior & Organization, 72*(1), 188-201.

Campbell, D. J. (1984). The Effects of Goal-Contingent Payment on the Performance of a Complex Task. *Personnel Psychology, 37*(1), 23-40.

Campbell, D. J. (1988). Task Complexity: A Review and Analysis. *Academy of Management Review, 13*(1), 40-52.

Campbell, D. J., & Ilgen, D. R. (1976). Additive Effects of Task Difficulty and Goal Setting on Subsequent Task Performance. *Journal of Applied Psychology, 61*(3), 319-324.

Campbell, D. T., & Fiske, D. W. (1959a). Convergent and Discriminant Validation by the Multitrait-Multimethod Matrix. *Psychological Bulletin, 56*(2), 81-105.

Campbell, D. T., & Fiske, D. W. (1959b). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin, 56*(1), 81-105.

Campbell, D. T., & Stanley, J. C. (1963). *Experimental and Quasi-Experimental Designs for Research*. Dallas, TX: Houghton Mifflin Company.

Cannon-Bowers, J. A., Salas, E., & Converse, S. (1993). Shared mental models in expert team decision making. In J. Castellan Jr. (Ed.), *Cognitive Skills and Their Acquisition*. Hillsdale, NJ: Lawrence Erlbaum Associates Inc.

Caporael, L. R. (1986). Anthropomorphism and mechanomorphism: Two faces of the human machine. *Computers in Human Behavior, 2*(3), 215-234.

Carlson, J. R., & Zmud, R. W. (1999). Channel Expansion Theory and the Experiential nature of Media Richness Perceptions. *Academy of Management Journal, 42*(2), 153-170.

Carlson, P. J., & Davis, G. B. (1998). An Investigation of Media Selection Among Directors and Mangers: From "Self" to "Other" Orientation. *MIS Quarterly, 22*(3), 335-362.

Carpenter, S., & Radhakrishan, P. (2002). The Relation Between Allocentrism and Perceptions of Ingroups. *Personality and Social Psychology Bulletin, 28*(11), 1528-1537.

Cattell, R. B., Eber, H. W., & Tatsuoka, M. M. (1970). *The Handbook for the Sixteen Personality Factor Questionnaire*. Champaign, IL: Institute for Personality and Ability Testing.

Cheek, J. M., & Buss, A. H. (1981). Shyness and sociability. *Journal of Personality and Social Psychology, 41*(2), 330-339.

Chesebro, J. (1985). Computer-medicated interpersonal communication. In B. Ruben (Ed.), *Information and Behavior* (Vol. 1, pp. 202-224). New Brunswick, NJ: Transaction.

Chi, E. H., Gumbrecht, M., & Hong, L. (2006). *Visual Foraging of Highlighted Text: An Eye-tracking Study.* Paper presented at the Conference on Human Factors in Computing Systems, Montreal, Quebec

Choo, C. W. (2006). *The Knowing Organization* (2nd ed.). New York, NY: Oxford University Press.

Churchill, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research, 16*(1), 64-73.

Clark, L. A., & Watson, D. (1995). Constructing Validity: Basic Issues in Objective Scale Development. *Psychological Assessment, 7*(3), 309-319.

Clark, M. S., & Mills, J. (1993). The Difference between Communal and Exchange Relationships. *Personality and Social Psychology Bulletin, 19*(6), 684-691.

Clatterbuck, G. (1979). Attributional Confidence and Uncertainty. *Human Communication Research, 5*(2), 147-157.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (Second ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cohen, J. (2001). Defining Identification: A Theoretical Look at the Identification of Audiences with Media Characters. *Mass Communication and Society, 4*(2), 245-264.

Cooke, N. J., Kiekel, P. A., & Helm, E. E. (2001). Measuring Team Knowledge During Skill Acquisition of a Complex Task. *INTERNATIONAL JOURNAL OF COGNITIVE ERGONOMICS, 5*(3), 297-315.

Cropanzano, R., James, K., & Citera, M. (1992). A Goal Heirarchy Model of Personality, Motivation, and Leadership. *Research in Organizational Behavior, 15*(2), 267-322.

Cropanzano, R., & Mitchell, M. S. (2005). Social Exchange Theory: An Interdisciplinary Review. *Journal of Management, 31*(6), 874-900.

Culnan, M. J. (1983). Environmental Scanning: The Effects of Task Complexity and Source Accessibility on Information Gathering Behavior. *Decision Sciences, 14*(2), 194-206.

Culnan, M. J. (1984). The Dimensions of Accessibility to Online Information: Implications for Implementing Office Information Systems. *ACM Transactions on Office Information Systems, 2*(2), 141-150.

Culnan, M. J. (1985). The Dimensions of Perceived Accessibility to Information: Implications for Delivery of Information Systems and Services. *Journal of the American Society for Information Science, 36*(5), 302-308.

Daft, R. L., Lengel, R. H., & Trevino, L. K. (1987). Message Equivocality, Media Selection, and Manager Performance: Implications for Information Systems. *MIS Quarterly, 11*(3), 354-366.

Daft, R. L., & Macintosh, N. B. (1981). A Tentative Exploration into the Amount and Equivocality of Information Processing in Organizational Work Units. *Administrative Science Quarterly, 26*(2), 207-224.

Dahlin, K. B., Weingart, L. R., & Hinds, P. J. (2005). Team diversity and information use. *Academy of Management Journal, 48*(6), 1107-1123.

Dar-Nimrod, I., Rawn, C. D., Lehman, D. R., & Schwartz, B. (2009). The Maximization Paradox: The costs of seeking alternatives. *Personality and Individual Differences, 46*(5-6), 631-635.

Daugherty, T., Li, H., & Biocca, F. (2008). Consumer learning and the effects of virtual experience relative to indirect and direct product experience. *Psychology & Marketing, 25*(7), 568-586.

Davenport, T. H., & Prusak, L. (1998). *Working Knowledge*. Boston, MA: Harvard Business School Press.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.

de Mooj, M. (2004). *Consumer Behavior and Culture: Consequences for Global Marketing and Advertising*. Thousand Oaks, CA: Sage Publications.

Derlega, V. J., Winstead, B. A., & Jones, W. H. (1991). *Personality: Contemporary Theory and Research*. Chicago, IL: Nelson Hall.

Devine, D. J., & Kozlowski, S. W. J. (1995). Domain-specific knowledge and task characteristics in decision making. *Organizational Behavior and Human Decision Processes, 64*(3), 294-306.

Diamantopoulos, A., & Siguaw, J. A. (2006). Formative Versus Reflective Indicators in Organizational Measure Development: A Comparison and Empirical Illustration. *British Journal of Management, 17*(4), 263-282.

Dillard, J. P., Solomon, D. H., & Palmer, M. T. (1999). Structuring the concept of relational communication. *Communication Monographs, 66*(1), 49-65.

Downes, E. J., & McMillan, S. J. (2000). Defining interactivity: A qualitative identification of key dimensions. *New Media & Society, 2*(2), 157-179.

Downing, R. E., Moore, J. L., & Brown, S. W. (2005). The effects and interaction of spatial visualization and domain expertise on information seeking. *Computers in Human Behavior, 21*(2), 195-209.

Duck, S. (1988). *Relating to Others*. Chicago, IL: The Dorsey Press.

Duck, S. (1991). *Understanding Relationships*. New York, NY: Guilford Press.

Durcikova, A., & Gray, P. (2009). How Knowledge Validation Processes Affect Knowledge Contribution. *Journal of Management Information Systems, 25*(4), 81-107.

Eddy, T. J., Gallup, G. G., & Povinelli, D. J. (1993). Attribution of cognitive states to animals: Anthropomorphism in comparative perspective. *Journal of Social Issues, 49*(1), 87-101.

Edwards, J. R., & Bagozzi, R. P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological Methods, 5*(2), 155-174.

Eliassi-Rad, T., & Shavlik, J. (2003). A System for Building Intelligent Agents that Learn to Retrieve and Extract Information. *User Modeling and User-Adapted Interaction, 13*(1), 35-88.

Ellis, D. (1989). A Behavioral Appraoch to Information Retrieval System Design. *Journal of Documentation, 45*(3), 171-212.

Ellis, D. (1993). Modeling the information-seeking patterns of academic researchers: A grounded theory approach, *The Library Quarterly* (Vol. 63, pp. 69-86).

Ellis, D., Cox, D., & Hall, K. (1993). A comparison of the information-seeking patterns of researchers in the physical and social sciences, *Journal of Documentation* (Vol. 49, pp. 356-369).

Epley, N., Waytz, A., Akalis, S., & Cacioppo, J. T. (2008). When we need a human: Motivational determinants of anthropomorphism. *Social Cognition, 26*(2), 143-155.

Epley, N., Waytz, A., & Cacioppo, J. T. (2007). On seeing human: A three-factor theory of anthropomorphism. *Psychological Review, 114*(4), 864-886.

Etzioni, A. (1989). Humble Decision Making. *Harvard Business Review, 82*(3), 90-99.

Eyal, K., & Rubin, A. M. (2003). Viewer aggression and homophily, identification, and parasocial relationships with television characters. *Journal of Broadcasting & Electronic Media, 47*(1), 77-98.

Eysenck, H. J. (1967). *The Biological Basis of Personality*. Springfield, IL: Charles C. Thomas.

Eysenck, H. J. (1990). Biological Dimensions of Personality. In L. A. Pervin (Ed.), *Handbook of Personality: Theory and Research* (pp. 244-276). New York, NY: Guilford.

Eysenck, H. J., & Eysenck, M. W. (1985). *Personality and Individual Differences*. New York, NY: Guilford.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Reseach Methods, 39*(2), 175-191.

Ferrin, D. L., Bligh, M. C., & Kohles, J. C. (2008). It takes two to tango: An interdependence analysis of the spiraling of perceived trustworthiness and cooperation in interpersonal and intergroup. *Organizational Behavior and Human Decision Processes, 107*(2), 161-178.

Fornell, C., & Larker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(3), 39-50.

Fortin, D. R., & Dholakia, R. R. (2005). Interactivity and vividness effects on social presence and involvement with a web-based advertisement. *Journal of Business Research, 58*(3), 387-396.

Foulger, D. (1990). *Medium as Process: The structure, use, and practice of computer conferencing on IBM's IBMPC computer conferencing facility.*, Temple University.

Frenzen, J., & Nakamoto, K. (1993). Structure, Cooperation, and the Flow of Market Information. *Journal of Consumer Research, 20*(3), 360-375.

Frey, K. P., & Eagly, A. H. (1993). Vividness can undermine the persuasiveness of messages. *Journal of Personality and Social Psychology, 65*(1), 32-44.

Fulk, J., Heino, R., Flanagin, A. J., Monge, P. R., & Bar, F. o. (2004). A Test of the Individual Action Model for Organizational Information Commons. *Organization Science, 15*(5), 569-585.

Fulk, J., Steinfield, C., Schmitz, J., & Power, J. G. (1987). A Social Information Processing Model of Media Use in Organizations. *Communication Research, 14*(5), 529-552.

Gabarro, J. (1990). The development of working relationships. In J. Galegher, R. E. Kraut & C. Egido (Eds.), *Intellectual Teamwork: Social and Technological Foundations of Cooperative Work* (pp. 79-110). Hillsdale, NJ: Lawrence Erlbaum Associates.

Gale, A. (1973). The Psychophysiology of Individual Differences: Studies of Extraversion and the EEG. In P. Kline (Ed.), *New Approaches to Psychological Measurement* (pp. 211-256). London, UK: Wiley.

Galletta, D. F., Henry, R. M., McCoy, S., & Polak, P. (2006). When the Wait Isn't So Bad: The Interacting Effects of Website Delay, Familiarity, and Breadth. *Information Systems Research, 17*(1), 20-37.

Gallup, G. G. (1982). Self Awareness and the Emergence of Mind in Primates. *American Journal of Primatology, 2*, 237-248.

Gallup, G. G. (1985). Do Minds Exist in Species Other than our Own? *Neuroscience & Behavioral Reviews, 2*, 631-641.

Gefen, D. (2003). TAM or Just Plain Habit: A Look at Experienced Online Shoppers. *Journal of End User Computing, 15*(3), 1.

Gerring, R. J., & Prentice, D. A. (1996). Notes on Audience Response. In D. Bordwell & N. Carroll (Eds.), *Post-Theory: Reconstructing Film Studies* (pp. 388-403). Madison, WI: University of Wisconsin Press.

Gerstenberger, P. G., & Allen, T. J. (1968). Criteria Used by Research and Development Engineers in Selection of an Information Source. *Journal of Applied Psychology, 52*(4), 272-279.

Goei, R., Massi Lindsey, L. L., Boster, F. J., Skalski, P. D., & Bowman, J. M. (2003). The mediating roles of liking and obligation on the relationship between favors and compliance. *Communication Research, 30*(2), 178-197.

Gong, L. (2008). How social is social responses to computers? The function of the degree of anthropomorphism in computer representations. *Computers in Human Behavior, 24*(4), 1494-1509.

Gong, L., & Nass, C. (2007). When a Talking-Face Computer Agent is Half-Human and Half-Humanoid: Human Identity and Consistency Preference. *Human Communication Research, 33*(2), 163-193.

Goodhue, D. L. (1998). Development and measurement validity of a task-technology fit instrument for user evaluations of information systems. *Decision Sciences, 29*(1), 105-138.

Goodhue, D. L., & Thompson, R. L. (1995). Task-Technology Fit and Individual Performance. *MIS Quarterly, 19*(2), 213-236.

Gopher, D., & Donchin, E. (1986). Workload: An examination of the concept. In K. R. Boff, L. Kaufman & J. P. Thomas (Eds.), *Handbook of perception and human performance, Vol. 2: Cognitive processes and performance.* (pp. 1-49). Oxford England: John Wiley & Sons.

Gouldner, A. W. (1960). The Norm of Reciprocity: A Preliminary StatementThe Norm of Reciprocity: A Preliminary Statement *American Sociological Review, 25*(2), 161-178.

Gouveia, V. V., Clemente, M., & Espinosa, P. (2003). The Horizontal and Vertical Attributes of Individualism and Collectivism in a Spanish Population. *The Journal of Social Psychology, 143*(1), 43-63.

Granitz, N. A., Koernig, S. K., & Harich, K. R. (2009). Now it's personal: Antecedents and outcomes of rapport between business faculty and their students. *Journal of Marketing Education, 31*(1), 52-65.

Gremler, D. D., & Gwinner, K. P. (2000). Customer-Employee Rapport in Service Relationships. *Journal of Service Research, 3*(1), 82-104.

Gundykunst, W. B., Ting-Toomey, S., & Chua, E. (1988). *Culture and Interpersonal Communication*. Newbury Park, CA: Sage Publications.

Guthrie, S. E. (1993). *Faces in the Clouds: A New Theory of Religion*. New York, NY: Oxford University Press.

Haerem, T., & Rau, D. (2007). The influence of degree of expertise and objective task complexity on perceived task complexity and performance. *Journal of Applied Psychology, 92*(5), 1320-1331.

Hall, E. T. (1976). *Beyond Culture*. Garden City, NY: Doubleday.

Halpin, H., Robu, V., & Shepherd, H. (2007). *The complex dynamics of collaborative tagging*. Paper presented at the Proceedings of the 16th international conference on World Wide Web.

Hansen, M. T., Nohria, N., & Tierney, T. (1999). What's Your Strategy for Managing Knowledge? *Harvard Business Review, 77*(2), 106-115.

Hardey, M. (2008). The formation of social rules for digital interactions. *Information, Communication & Society, 11*(8), 1111-1131.

Hardy, B. W., & Scheufele, D. A. (2009). Presidential campaign dynamics and the ebb and flow of talk as a moderator: Media exposure, knowledge, and political discussion. *Communication Theory, 19*(1), 89-101.

Hart, P. J., & Rice, R. E. (1991). Using Information from External Databases: Contextual Relationships of Use, Access Method, Task, Database Type, Organizational Differences, and Outcomes. *Information Processing & Management, 27*(2), 461-479.

Hertzum, M., Andersen, H. H. K., Andersen, V., & Hansen, C. B. (2002). Trust in information sources: Seeking information from people, documents, and virtual agents. *Interacting with Computers, 14*(5), 575-599.

Hewstone, M., Rubin, M., & Willis, H. (2002). Intergroup Bias. *Annual Review of Psychology, 53*(1), 575-604.

Hill, G. W. (1982). Group versus individual performance: Are *N* + 1 heads better than one? *Psychological Bulletin, 91*(3), 517-539.

Hills, P., & Argyle, M. (2001). Happiness, introversion-extraversion and happy introverts. *Personality and Individual Differences, 30*(4), 595-608.

Hinkelmann, K., & Kempthorne, O. (2008). *Design and Analysis of Experiments* (2nd ed. Vol. 1). New York, NY: John Wiley & Sons.

Hofstede, G. H. (1991). *Cultures and Organizations: Software of the Mind*. London, UK: McGraw-Hill International (UK) Limited.

Hollingshead, A. B. (1998). Retrieval Processes in Transactive Memory Systems. *Journal of Personality & Social Psychology, 74*(3), 659-671.

Homans, G. C. (1958). Social Behavior as Exchange. *American Journal of Sociology, 63*(6), 597-606.

Hsieh, Y.-C., Chiu, H.-C., & Chiang, M.-Y. (2005). Maintaining a committed online customer: A study across search-experience-credence products. *Journal of Retailing, 81*(1), 75-82.

Humphrey, N. (1992). *A History of the Mind*. New York, NY: Simon & Schuster.

Humphries, N. (1984). *Consciousness Regained*. New York, NY: Oxford University Press.

Im, I., & Hars, A. (2007). Does a One-Size Recommendation System Fit All? The Effectiveness of Collaborative Filtering Based Recommendation Systems Across Different Domains and Search Modes. *ACM Transactions on Information Systems, 26*(1), 4.1-4.30.

Infante, D., Rancer, A., & Womack, D. (1997). *Building Communication Theory* (3rd ed.). Prospect Heights, IL: Waveland Press Inc.

Ingram, P., & Morris, M. W. (2007). Do people mix at mixers? Structure, homophily, and the 'life of the party'. *Administrative Science Quarterly, 52*(4), 558-585.

Jacoby, J., Jaccard, J. J., Currim, I., Kuss, A., Ansari, A., & Troutman, T. (1994). Tracing the Impact of Item-by-Item Information Accessing on Uncertainty Reduction. *Journal of Consumer Research, 21*(3), 291-303.

Jarvenpaa, S. L., Knoll, K., & Leidner, D. E. (1998). Is there anybody out there? Antecedents of trust in global virtual teams. *Journal of Management Information Systems, 14*(4), 29-64.

Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research, 30*(2), 199-218.

Jiang, Z., & Benbasat, I. (2007a). The Effects of Presentation Formats and Task Complexity on Online Consumers' Product Understanding. *MIS Quarterly, 31*(3), 475-500.

Jiang, Z., & Benbasat, I. (2007b). Investigating the Influence of the Functional Mechanisms of Online Product Presentations. *Information Systems Research, 18*(4), 454-470.

Jimmieson, N. L., & Terry, D. J. (1999). The moderating role of task characteristics in determining responses to a stressful work simulation. *Journal of Organizational Behavior, 20*(5), 709-736.

Johansen, R., & DeGrasse, R. (1978). Computer-Based Teleconferencing: Effects on Working Patterns. *Journal of Communication, 29*(2), 30-41.

Johnson, G. J., Bruner, G. C., & Kumar, A. (2006). Interactivity and its Facets Revisited. *Journal of Advertising, 35*(4), 35-52.

Johnson, J. D. (1997). *Cancer Related Information Seeking*. Cresskill, NJ: Hampton Press.

Kalyanaraman, S., & Sundar, S. S. (2006). The Psychological Appeal of Personalized Content in Web Portals: Does Customization Affect Attitudes and Behavior? *Journal of Communication, 56*(1), 110-132.

Kane, G. C., & Fichman, R. G. (2009). THE SHOEMAKER'S CHILDREN: USING WIKIS FOR INFORMATION SYSTEMS TEACHING, RESEARCH, AND PUBLICATION. *MIS Quarterly, 33*(1), 1-17.

Karelaia, N., & Hogarth, R. M. (2008). Determinants of linear judgment: A meta-analysis of lens model studies. *Psychological Bulletin, 134*(3), 404-426.

Kelley, H. (1983). Epilogue: An essential science. In H. Kelley, E. Berscheid, J. Christensen, T. Harvey, G. Huston, E. Levinger, L. McClintock, L. Peplau & D. Peterson (Eds.), *Close Relationships* (pp. 486-503). New York, NY: Freeman.

Kim, H.-N., Ji, A.-T., Ha, I., & Jo, G.-S. Collaborative filtering based on collaborative tagging for enhancing the quality of recommendation. *Electronic Commerce Research & Applications, 9*(1), 73-83.

Kim, H.-N., Ji, A.-T., Ha, I., & Jo, G.-S. (2008). Collaborative filtering based on collaborative tagging for enhancing the quality of recommendation. *Electronic Commerce Research & Applications, 9*(1), 73-83.

Kim, S., & Soergel, D. (2005). Selecting and Measuring Task Characteristics as Independent Variables. *Proceedings of the American Society for Information Science and Technology, 42*(1), na.

Kiousis, S. (2002). Interactivity: A Current Explication. *New Media & Society, 4*(3), 355-383.

Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling* (2 ed.). New York, New York: Guilford Press.

Knobloch, L. K., Miller, L. E., Sprecher, S., Wenzel, A., & Harvey, J. (2008). Uncertainty and relationship initiation. In *Handbook of relationship initiation.* (pp. 121-134). New York, NY US: Psychology Press.

Ko, D.-G., Kirsch, L. J., & King, W. R. (2005). Antecedents of Knowledge Transfer from Consultants to Client in Enterprise Systems Implementations. *MIS Quarterly, 29*(1), 59-85.

Kobsa, A., Koenemann, J., & Pokl, W. (2001). Personalized Hypermedia Presentation Techniques for Improving Online Customer Relationships. *The Knowledge Engineering Review, 16*(2), 111-155.

Kock, N. (2004). The psychobiological model: Towards a new theory of computer-mediated communication based on Darwinian evolution. *Organization Science, 15*(3), 327-348.

Kock, N. (2009). Information Systems Theorizing Based on Evolutionary Psychology: An Interdisciplinary Review and Theory Integration Framework. *MIS Quarterly, 33*(2), 395-418.

Kraemer, K. L., Danzinger, J. N., Dunkle, D. E., & King, J. L. (1993). The Usefulness of Computer-Based Information to Public Managers. *MIS Quarterly, 17*(2), 129-148.

Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukophadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist, 53*(9), 1017-1031.

Kuhlthau, C. C. (1991). Inside the Search Process: Information Seeking from the User's Perspective. *Journal of the American Society of Information Science, 42*(5), 361-371.

Kumari, V., Ffytche, D. H., Williams, S. C. R., & Gray, J. A. (2004). Personality Predicts Brain Responses to Cognitive Demands. *Journal of Neuroscience, 24*(47), 10636-10641.

Kwak, N., Williams, A. E., Wang, X., & Lee, H. (2005). Talking Politics and Engaging Politics: An Examination of the Interactive Relationships Between Structural Features of Political Talk and Discussion Engagement. *Communication Research, 32*(1), 87-111.

Kwasitsu, L. (2000). Information-seeking behavior of design, process, and manufacturing engineers. *Library & Information Science Research, 25*(4), 459-476.

Laroche, M., Kalamas, M., & Cleveland, M. (2005). 'I' versus 'we': How individualists and collectivists use information sources to formulate their service expectations. *International Marketing Review, 22*(3), 279-308.

Lazerfeld, P. F., & Merton, R. K. (1954). Friendship as a Social Process: A Substantive Methodological Analysis. In M. Berger, T. Abel & C. H. Page (Eds.), *Freedom and Control in Modern Society*. New York, NY: Van Norstrand.

Lazersfeld, P. F., & Merton, R. K. (1954). Friendship as a Social Process: A Substantive Methodological Analysis. In M. Berger, T. Abel & C. H. Page (Eds.), *Freedom and Control in Modern Society*. New York, NY: Van Norstrand.

Leary, M. R., & Kowalski, R. M. (1990). Impression management: A literature review and two component model. *Psychological Bulletin, 107*(1), 34-47.

Leckie, G. J., Pettigrew, K. E., & Sylvain, C. (1996). Modelling the Information Seeking of Professionals: A General Model Derived from Research on Engineers, Health Care Professionals, and Lawyers. *Library Quarterly, 66*(2), 161-193.

Lee, E.-J. (2008). Flattery may get Computers somewhere, sometimes: The Moderating Role of Output Modality, Computer Gender and User Gender. *International Journal of Human Computer Studies, 66*(11), 789-800.

Leung, K. (1989). CROSS-CULTURAL DIFFERENCES: INDIVIDUAL-LEVEL VS. CULTURE-LEVEL ANALYSIS. *International Journal of Psychology, 24*(6), 703.

Levin, D. Z., & Cross, R. (2004). The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management Science, 50*(11), 1477-1490.

Levine, T., & Donitsa-Schmidt, S. (1998). Computer Use, Confidence, Attitudes, and Knowledge: A Causal Analysis. *Computers in Human Behavior, 14*(2), 125-146.

Levinson, H. (1965). Reciprocation: The relationship between man and organization. *Administrative Science Quarterly, 9*(4), 370-390.

Levitt, B., & March, J. G. (1988). Organizational learning. *Annual Review of Sociology, 14*(1), 319-338.

Li, D., Browne, G. J., & Chau, P. Y. K. (2006). An Empirical Investigation ofWeb Site Use Using a Commitment-Based Model. *Decision Sciences, 37*(3), 427-444.

Limayem, M., & Hirt, S. G. (2003). Force of habit and information systems usage: Theory and initial validation, *J. Assoc. Inform. Systems* (Vol. 4, pp. 65-97).

Littlepage, G. E., Hollingshead, A. B., Drake, L. R., & Littlepage, A. M. (2008). Transactive memory and performance in work groups: Specificity, communication, ability differences, and work allocation. *Group Dynamics: Theory, Research, and Practice, 12*(3), 223-241.

Lobel, M., Neubauer, M., & Swedburg, R. (2005). Comparing How Students Collaborate to Learn About the Self and Relationships in a Real-Time Non-Turn-Taking Online and Turn-Taking Face-to-Face Environment. *Journal of Computer-Mediated Communication, 10*(4).

Loevinger, J. (1957). Objective tests as instruments of psychological theory. *Psychological Reports, 3*(6), 635-694.

Lucas, R. E., & Diener, E. (2001). Understanding extraverts' enjoyment of social situations: The importance of pleasantness. *Journal of Personality and Social Psychology, 81*(2), 343-356.

Lucas, R. E., Le, K., & Dyrenforth, P. S. (2008). Explaining the extraversion/positive affect relation: Sociability cannot account for extraverts' greater happiness. *Journal of Personality, 76*(3), 385-414.

MacCallum, R. C., & Browne, M. W. (1993). The use of causal indicators in covariance structure models: Some practical issues. *Psychological Bulletin, 114*(3), 533.

Mantovani, F. (2001). Networked seduction: A test-bed for the study of strategic communication on the Internet. *CyberPsychology & Behavior, 4*(1), 147-154.

McCall, H., Arnold, V., & Sutton, S. G. (2008). Use of Knowledge Management Systems and the Impact on the Acquisition of Explicit Knowledge. *Journal of Information Systems, 22*(2), 77-101.

McCrae, R. R., & Costa, P. T. (1985). Updating Norman's Adequate Taxonomy: Intelligence and Personality Dimensions in Natural Language and in Questionnaires. *Journal of Personality and Social Psychology, 49*, 710-721.

McCroskey, J., Richmond, V. P., & Daly, J. A. (1975). The Development of a Measure of Perceived Homophily in Interpersonal Communication. *Human Communication Research, 1*(4), 323-332.

McCroskey, L. L., McCroskey, J., & Richmond, V. P. (2006). Analysis and Improvement of the Measurement of Interpersonal Attraction and Homophily. *Communication Quarterly, 54*(1), 1-31.

McKinney, V., Yoon, K., & Zahedi, F. M. (2002). The Measurement of Web-Customer Satisfaction: An Expectation and Disconfirmation Approach. *Information Systems Research, 13*(3), 296-315.

McMillan, S. J. (2002). A four-part model of cyber-interactivity: Some cyber-places are more interactive than others. *New Media & Society, 4*(2), 271-291.

McMillan, S. J., & Hwang, J.-S. (2002). Measures of Perceived Interactivity: An Exploration of the Role of Direction of Communication, User Control, and Time in Shaping Perceptions of Interactivity. *Journal of Advertising, 31*(3), 29-42.

McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology, 27*, 415-444.

Meho, L. I., & Tibbo, H. R. (2003). Modeling the Information-seeking Behavior of Social Scientists: Ellis's Study Revisited, *Journal of the American Society for Information Science and Technology* (Vol. 54, pp. 570-575S577).

Mehrabian, A. (1967). Orientation Behaviors and Nonverbal Attitude Communication. *Journal of Communication, 16*(3), 324-332.

Meyer, J. P., & Herscovitch, L. (2001). Commitment in the Workplace: Toward a General Model. *Human Resource Management Review, 11*(3), 299-326.

Meyers, D. (1985). *Home Computer Communications Networks*. New Orlean, LA: Loyola University.

Meyerson, D., Weick, K. E., Kramer, R. M., & Tyler, T. R. (1996). Swift trust and temporary groups. In *Trust in organizations: Frontiers of theory and research.* (pp. 166-195). Thousand Oaks, CA US: Sage Publications, Inc.

Miller, G. A. (1956). The Magical Number Seven Plus or Minus Two. *Psychological Review, 63*, 81-97.

Miller, V. D., & Jablin, F. M. (1991). Information seeking during organizational entry: Influences, tactics, and a model of the process. *Academy of Management Review, 16*(1), 92-120.

Miner, F. C. (1984). Group versus individual decision making: An investigation of performance measures, decision strategies, and process losses/gains. *Organizational Behavior & Human Performance, 33*(1), 112-124.

Mintzberg, H. (1973). *The Nature of Managerial Work*. New York, NY: Harper & Row.

Mitra, A., Raymond, M. A., & Hopkins, C. D. (2008). Can consumers recognize misleading advertising content in a media rich online environment? *Psychology & Marketing, 25*(7), 655-674.

Moon, Y. (2000). Intimate Exchanges: Using Computers to Elicit Self-Disclosure from Consumers. *Journal of Consumer Research, 26*(4), 323-339.

Moon, Y. (2002). Personalization and personality: Some effects of customizing message style based on consumer personality. *Journal of Consumer Psychology, 12*(4), 313-325.

Moon, Y. (2003). Don't blame the computer: When self-disclosure moderates the self-serving bias. *Journal of Consumer Psychology, 13*(1), 125-137.

Moon, Y., & Nass, C. (1996). How 'Real' are computer personalities? Psychological responses to personality types in human-computer interaction. *Communication Research, 23*(6), 651-674.

Moore, G. C., & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research, 2*(3), 192-222.

Moorman, R. H., & Blakely, G. L. (1995). Individualism-collectivism as an individual difference predictor of organizational citizenship behavior. *Journal of Organizational Behavior, 16*(2), 127-142.

Morrison, E. W. (1993). Newcomer information seeking: Exploring types, modes, sources, and outcomes. *Academy of Management Journal, 36*(3), 557-589.

Morrison, E. W. (2002). Information seeking within organizations. *Human Communication Research, 28*(2), 229-242.

Morrison, E. W., & Vancouver, J. B. (2000). Within-person analysis of information seeking: The effects of perceived costs and benefits. *Journal of Management, 26*(1), 119-137.

Mourali, M., Laroche, M., & Pons, F. (2005). Antecedents of consumer relative preference for interpersonal information sources in pre-purchase search. *Journal of Consumer Behaviour, 4*(5), 307-318.

Mukherjee, R., Sajja, N., & Sen, S. (2003). A Movie Recommendation System--An Application of Voting Theory in User Modeling. *User Modeling and User-Adapted Interaction, 13*(1), 5-33.

Mutz, D. C., & Mondak, J. J. (2006). The Workplace as a Context for Cross-Cutting Political Discourse. *The Journal of Politics, 68*(1), 140-155.

Nardi, B. A. (2005). Beyond bandwidth: Dimensions of connection in interpersonal interaction. *The Journal of Computer-Supported Cooperative Work, 14*(2), 91-130.

Nass, C., Lombard, M., Henriksen, L., & Steuer, J. (1995). Anthropocentrism and computers. *Behaviour & Information Technology, 14*(4), 229-238.

Nass, C., & Moon, Y. (2000). Machines and mindlessness: Social responses to computers. *Journal of Social Issues, 56*(1), 81-103.

Nass, C., Moon, Y., Fogg, B. J., & Reeves, B. (1995). Can computer personalities be human personalities? *International Journal of Human-Computer Studies, 43*(2), 223-239.

Nass, C., Steuer, J., & Tauber, E., R. . (1994). *Computers are Social Actors*. Paper presented at the Proceedings of the SIGCHI conference on Human factors in computing systems: celebrating interdependence.

Nelson, P. J. (1974). Advertising as Information. *Journal of Political Economy, 83*(3), 729-754.

Nesbett, R. E., & Ross, L. (1980). *Human Inference: Strategies and Shortcomings of Social Judgements*. Englewood Cliffs, NJ: Prentice-Hall.

Nowak, K. L., & Rauh, C. (2006). The Influence of the Avatar on Online Perceptions of Anthropomorphism, Androgyny, Credibility, Homophily, and Attraction. *Journal of Computer-Mediated Communication, 11*(1), 153-178.

Nowak, K. L., & Rauh, C. (2008). Choose your 'buddy icon' carefully: The influence of avatar androgyny, anthropomorphism and credibility in online interactions. *Computers in Human Behavior, 24*(4), 1473-1493.

Nunnally, J. C. (1994). *Psychometric Theory*. New York, NY: McGraw-Hill.

O'Reilly, C. A. (1982). Variations in Decision Makers' Use of Information Sources: The Impact of Quality and Accessibility of Information. *Academy of Management Journal, 25*(4), 756-771.

O'Reilly, C. A., Chatman, J. A., & Anderson, J. C. (1987). Message Flow and Decision Making. In F. M. Jablin, L. L. Putnam, K. H. Roberts & L. W. Porter (Eds.), *Handbook of Organizational Communication: An Interdisciplinary Perspective* (pp. 600-623). Newbury Park, CA: Sage Publications.

Osterloh, M., & Frey, B. S. (2000). Motivation, knowledge transfer, and organizational forms. *Organization Science, 11*(5), 538-550.

Ouellette, J. A., & Wood, W. (1998). Habit and intention in everyday life: the multiple processes by which past behavior predict future behavior, *Psychological Bulletin* (Vol. 124, pp. 54-74).

Oxoby, R. J., & Finnigan, H. (2007). Developing heuristic-based quality judgments: Blocking in consumer choice. *Psychology & Marketing, 24*(4), 295-313.

Parameswaran, M., & Whinston, A. B. (2007). Research Issues in Social Computing. *Journal of the Association for Information Systems, 8*(6), 336-350.

Patterson, M. (1995). Invited article: A parallel process model of nonverbal communication. *Journal of Nonverbal Behavior, 19*(1), 3-29.

Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The Adaptive Decision Maker*. New York, NY: Cambridge university Press.

Perrow, C. (1967). A Framework for the Comparitive Analysis of Organizations. *American Sociological Review, 32*(2), 194-208.

Petty, R. E., Barden, J., & Wheeler, S. C. (2002). The Elaboration Liklihood Model of Persuasion: Health Promotions that Yield Sustained Behavioral Change. In R. J. DiClemente, R. A. Crosby & M. Kegler (Eds.), *Emerging Theories in Health Promotion Practice and Research* (pp. 71-99). San Francisco, CA: Jossey-Bass.

Piccolo, R. F., & Colquitt, J. A. (2006). Transformational Leadership and Job Behaviors: The Mediating Role of Core Job Characteristics. *Academy of Management Journal, 49*(2), 327-340.

Pirolli, P., & Card, S. (1999). Information Foraging. *Psychological Review, 106*(4), 643-675.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903.

Porter, C. E., & Donthu, N. (2006). Using the technology acceptance model to explain how attitudes determine Internet usage: The role of perceived access barriers and demographics. *Journal of Business Research, 59*(9), 999-1007.

Poston, R. S., & Speier, C. (2005). Effective Use of Knowledge Management Systems: A Process Model of Content Ratings and Credibility Indicators. *MIS Quarterly, 29*(2), 221-244.

Rafaeli, S. (1986). The electronic bulletin board: A computer-driven mass medium. *Computers and the Social Sciences, 2*(2), 123-136.

Reagans, R. (2005). Preferences, Identity, and Competition: Predicting Tie Strength from Demographic Data. *Management Science, 51*(9), 1374-1383.

Rice, R. E. (1992). Task analyzability, use of new media, and effectiveness: A multi-site exploration of media richness. *Organization Science, 3*(4), 475-500.

Rice, R. E. (2008). Unusual routines: Organizational (non)sensemaking. *Journal of Communication, 58*(1), 1-19.

Rice, R. E., & Love, G. (1987). Electronic Emotion: Socio-emotional content in a computer-mediated commmunication network. *Communication Research, 14*(1), 85-105.

Rice, R. E., & Shook, D. E. (1990). Relationships of Job Categories and Organizational Levels to Use of Communication Channels, Including Electronic mail: A Meta-Analysis and Extension. *Journal of Management Studies, 27*(2), 195-229.

Ringberg, T., & Reihlen, M. (2008). Towards a Socio-Cognitive Approach to Knowledge Transfer. *Journal of Management Studies, 45*(5), 912-935.

Rogers, E. M., & Bhowmik, D. K. (1970). Homophily-Heterophily: Relational Concepts for Communication Research. *Public Opinion Quarterly, 34*(4), 523-538.

Ruggles, R. (1998). The State of the Notion: Knowledge Management in Practice. *California Management Review, 40*(3), 80-89.

Rulke, D. L., Zaheer, S., & Anderson, M. H. (2000). Sources of Managers' Knowledge of Organizational Capabilities. *Organizational Behavior and Human Decision Processes, 82*(1), 134-149.

Ryckman, R. M. (2004). *Theories of personality (8th ed.)*. Belmont, CA US: Wadsworth/Thomson Learning.

Sacchi, S., & Burigo, M. (2008). Strategies in the Information Search Process: Interaction Among Task Structure, Knowledge, and Source. *Journal of General Psychology, 135*(3), 252-270.

Scealy, M., Phillips, J. G., & Stevenson, R. (2002). Shyness and anxiety as predictors of patterns of Internet usage. *CyberPsychology & Behavior, 5*(6), 507-515.

Schein, E. H. (1992). *Organizational Culture and Leadership*. San Francisco, CA: Jossey-Bass Publishers.

Schwartz, B., Ward, A., Monterosso, J., Lyubomirsky, S., White, K., & Lehman, D. R. (2002). Maximizing versus satisficing: Happiness is a matter of choice. *Journal of Personality and Social Psychology, 83*(5), 1178-1197.

Short, J., Williams, E., & Christie, B. (1976). *The Social Psychology of Telecommunications*. New York, NY: Wiley.

Simon, H. A. (1971). Designing Organizations for an Information-Rich World. In M. Greenberger (Ed.), *Computers, Communication, and the Public Interest*. Baltimore, MD: The John Hopkins Press.

Simon, H. A. (1979). Rational Decision Making in Business Organizations. *American Economic Review, 69*(4), 493-513.

Singelis, T. M., Triandis, H. C., Bhawuk, D., & Gelfand, M. J. (1995). Horizontal and vertical dimensions of individualism and collectivism: A theoretical and measurement refinement. *Cross-Cultural Research: The Journal of Comparative Social Science, 29*(3), 240-275.

Sniezek, J. A., & Van Swol, L. M. (2001). Trust, confidence, and expertise in a judge-advisor system. *Organizational Behavior and Human Decision Processes, 84*(2), 288-307.

Spector, P. E. (1992). *Summated Rating Scale Construction: An Introduction*. Thousand Oaks, CA: Sage Publications.

Stenberg, G., Risberg, J., Warkentin, S., & Rosen, I. (1990). Regional patterns of cortical blood flow distinguish extraverts from introverts. *Personality and Individual Differences, 11*(7), 663-673.

Steuer, J. (1992). Defining Virtual Reality: Dimensions Determining Telepresence. *Journal of Communication, 42*(4), 73-93.

Stvilia, B., Twidale, M. B., Smith, L. C., & Gasser, L. (2008). Information quality work organization in Wikipedia. *Journal of the American Society for Information Science and Technology, 59*(6), 983-1001.

Sundar, S. S., & Kalyanaraman, S. (2004). Arousal, memory, and impression-formation effects of animation speed in web advertising. *Journal of Advertising, 33*(1), 8-17.

Swanson, E. B. (1987). Information Channel Disposition and Use. *Decision Sciences, 18*(1), 131-145.

Tagiuri, R. (1958). Introduction. In R. Tagiuri & L. Petrullo (Eds.), *Person Perception and Interpersonal Behavior* (pp. ix-xvii). Palo Alto, CA: Stanford University Press.

Tajfel, H., & Turner, J. C. (1986). The Social Indentity Theory of Intergroup Conflict. In S. Worchel & W. G. Austin (Eds.), *Psychology of Intergroup Relations*. Chicago, IL: Nelson-Hall.

Takeuchi, Y., & Katagiri, Y. (1999). *Identity Perception of Computers as Social Actors*. Paper presented at the Proceedings of ICCS'99.

Tam, K. Y., & Ho, S. Y. (2006). Understaning the Impact of Web Personalization on User Information Processing and Decision Outcomes. *MIS Quarterly, 30*(4), 865-890.

Taris, T. W., & Schreurs, P. J. G. (2007). How may nonresponse affect findings in organizational surveys? The tendency-to-the-positive effect. *International Journal of Stress Management, 14*(3), 249-259.

Thibault, J. W., & Kelley, H. (1959). *The Social Psychology of Groups*. New York, NY: John Wiley.

Tiamiyu, M. (1992). The relationships between source use and work complexity, decision-maker discretion and activity duration in Nigerian government ministries. *International Journal of Information Management, 12*(2), 130-141.

Touchey, J. C. (1974). Situated Identities, Attitude Similarity, and Interpersonal Attraction. *Sociometry, 37*(4), 363-374.

Triandis, H. C., Bontempo, R., Villareal, M. J., Asai, M., & Lucca, N. (1988). Individualism and collectivism: Cross-cultural perspectives on self-ingroup relationships. *Journal of Personality and Social Psychology, 54*(2), 323-338.

Triandis, H. C., Leung, K., Villareal, M., & Clack, F. L. (1985). Allocentric vs. idiocentric tendencies: Convergent and discriminant validation. *Journal of Research in Personality, 19*(3), 395-415.

van 't Wout, M., & Sanfey, A. G. (2008). Friend or foe: The effect of implicit trustworthiness judgments in social decision-making. *Cognition, 108*(3), 796-803.

Van de Ven, A. H., Delbecq, A., & Koenig, R. (1976). Determinants of Coordination Modes within Organizations. *American Sociological Review, 41*(2), 322-338.

Van Swol, L. M., & Sniezek, J. A. (2005). Factors affecting the acceptance of expert advice. *British Journal of Social Psychology, 44*(3), 443-461.

Vancouver, J. B., & Morrison, E. W. (1995). Feedback inquiry: The effect of source attributes and individual difference. *Organizational Behavior & Human Decision Processes, 62*(3), 276-285.

VandeWalle, D., Genesan, S., Challagalla, G. N., & Bron, S. P. (2000). An integrated model of feedback-seeking behavior: Disposition, context, and cognition. *Journal of Applied Psychology, 85*(6), 996-1003.

Vasalou, A., Joinson, A., BÃ¤nziger, T., Goldie, P., & Pitt, J. (2008). Avatars in social media: Balancing accuracy, playfulness and embodied messages. *International Journal of Human-Computer Studies, 66*(11), 801-811.

Verplanken, B., Aarts, H., van Knippenberg, A., & Moonen, A. (1998). Habit versus planned behaviour: A field experiment, *British J. Soc. Psych* (Vol. 37, pp. 111-128).

Wagner, J. A. I. (1995). STUDIES OF INDIVIDUALISM-COLLECTIVISM: EFFECTS ON COOPERATION IN GROUPS. *Academy of Management Journal, 38*(1), 152-172.

Walther, J. B. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research, 23*(1), 3-43.

Walther, J. B., & Burgoon, J. K. (1992). Relational Communication in Computer-Mediated Interaction. *Human Communication Research, 19*(1), 50-88.

Wang, P., & White, M. (1999). A cognitive model of document use during a research project. Study II. Decisions at reading and citing stages. *Journal of the American Society for Information Science, 52*(2), 98-114.

Wasti, S. A. (2003). The Influence of Cultural Values on Antecedents of Organisational Commitment: An Individual-Level Analysis. *Applied Psychology: An International Review, 52*(4), 533-554.

We, G. (1993). Cross-gender communication in Cyberspace. *The Arachnet Journal on Virtual Culure, 2*(3), article 3.

Wegner, D. M., Erber, R., & Raymond, P. (1991). Transactive Memory in Close Relationships. *Journal of Personality and Social Psychology, 61*(6), 923-929.

Wilson, D. S., & Kniffin, K. M. (2009). Multilevel selection and the social transmission of behavior. *Human Nature, 10*(3), 291-310.

Wind, J., & Rangaswany, A. (2001). Customerization: The Next Revolution in Mass Customization. *Journal of Interactive Marketing, 15*(1), 13-32.

Wixom, B., & Todd, P. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research, 16*(1), 85-102.

Wood, R. E., George-Falvy, J., Debowski, S., Erez, M., Kleinbeck, U., & Thierry, H. (2001). Motivation and information search on complex tasks. In *Work motivation in the context of a globalizing economy.* (pp. 27-48). Mahwah, NJ US: Lawrence Erlbaum Associates Publishers.

Xu, Y. (2005). *Information sharing in work groups: A transactive memory approach.* Unpublished Ph.D., University of Southern California, United States -- California.

Yates, D., Wagner, C., & Majchrzak, A. (2010). Factors affecting shapers of organizational wikis. *Journal of the American Society for Information Science & Technology, 61*(3), 543-554.

Yuan, Y. C., Fulk, J., & Monge, P. R. (2007). Access to information in connective and communal transactive memory systems. *Communication Research, 34*(2), 131-155.

Yuan, Y. C., & Gay, G. (2006). Homophily of Network Ties and Bonding and Bridging Social Capital in Computer-Mediated Distributed Teams. *Journal of Computer-Mediated Communication, 11*(4), 1062-1084.

Zammuto, R. F., Griffith, T. L., Majchrzak, A., Dougherty, D. J., & Faraj, S. (2007). Information Technology and the Changing Fabric of Organization. *Organization Science, 18*(5), 749-762.

Zeffane, R. M., & Gul, F. A. (1993). The effects of task characteristics and sub-unit structure on dimensions of information processing. *Information Processing & Management, 29*(4), 703-719.

Zilberstein, K. (2006). Clarifying core characteristics of attachment disorders: A review of current research and theory. *American Journal of Orthopsychiatry, 76*(1), 55-64.

Zimmer, J. C., Henry, R. M., & Butler, B. S. (2008). Determinants of the Use of Relational and Nonrelational Information Sources. *Journal of Management Information Systems, 24*(3), 301-336.

Zmud, R. W. (1978). An Empirical Investigation of the Dimensionality of the Concept of Information. *Decision Sciences, 9*(2), 187-195.

Zmud, R. W., Lind, M. R., & Young, F. W. (1990). An Attribute Space for Organizational Communication Channels. *Information Systems Research, 1*(4), 440-457.