ADAPTING WAYS OF KNOWING DEPENDENT ON CONTEXT

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The following faculty members have examined the final copy of this thesis for form and content, and recommend that it be accepted in partial fulfillment of the requirement for the degree of Master of Education with a major in Educational Psychology.

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ABSTRACT

This study is a further investigation of epistemological beliefs, specifically ways of knowing, and whether people will adapt these beliefs dependent upon social context (i.e. in-group or out-group). In addition, this research examined the role of gender and one's use of connected knowing (CK) or separate knowing (SK). One hundred twenty-three college students were surveyed to determine if use of CK or SK shifted when thinking of in-group or out-group associations. Results did not confirm a shift in the use of CK or SK dependent upon social context. The results confirmed that men had higher SK scores than women; however, no gender differences were confirmed in CK scores.

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CHAPTER 1

THE PROBLEM

Personal epistemology (i.e. beliefs about the nature of knowledge and learning) and the formation of epistemological beliefs continue to be a growing area of interest and research for educators. Personal epistemology beliefs are "how individuals come to know the theories and beliefs they hold about knowing, and the manner in which such epistemological premises influence the cognitive processes of thinking and reasoning," (Hofer & Pintrich, 1997, p. 88). For example, a person could believe that knowledge is always changing or never changes. The formation of these personal epistemological beliefs is attributed to a person's family background, social environment and educational level; and can influence one's reasoning ability, task persistence and even academic and professional endeavors (Schraw, 2001). The focus of this study is whether people adapt a particular form of epistemological beliefs, specifically ways of knowing, across social contexts (i.e. people one relates to versus people one does not relate to).

The early models of epistemological belief research focused on the structural, developmental sequences of epistemological beliefs (Perry, 1968) and thinking, reasoning and reflective judgment processes (Kitchner & King, 1994). The study of personal epistemology beliefs has moved forward from the earlier developmental sequence to include social and cognitive influences. For example, in the Social-Cognitive model (Dweck, 1999; Dweck & Leggett, 1988) proposed that people were motivated by the implicit beliefs they hold about intelligence. People either hold a belief that intelligence is changeable and improves (incremental theory) or that intelligence is unchangeable and fixed (entity theory).

Building on the earlier development models, Schommer (1990) expanded the focus of epistemological beliefs to include five dimensions: (a) certainty of knowledge, (b) structure of

knowledge, (c) source of knowledge, (d) control of knowledge acquisition, and (e) speed of knowledge. Based on this research, Schommer coined the term "epistemological belief system" to encompass the complexity of epistemological beliefs. Researchers following this multiple dimension conceptualization have uncovered the influence of these epistemological beliefs on multiple aspects of learning (Hofer, 2004; Schommer, Crouse, & Rhodes, 1992) academic achievement (Dweck & Leggett, 1988; Schommer & Walker, 1997), comprehension (Schommer, 1990; Schommer, Crouse, & Rhodes, 1992), attitudes toward school (Schommer & Walker, 1997) and grade-point average (Schommer & Walker, 1997).

One aspect of personal epistemology, ways of knowing (Belenky, Clinchy, Goldberger, & Tarule, 1986), refers to the methodology one employs to evaluate and construct knowledge when socially interacting with others. Two ways of knowing have been defined: connected and separate knowing. While the uses of both separate knowing and connected knowing are a function of objective and systematic procedural style processing, the methodology employed to reach a final decision is very different. Individuals with more dominant separate knowing beliefs initially question and doubt, and are critical of the information received. They take an impersonal, detached, and often adversarial approach before attempting to understand the information. Individuals with more connected knowing beliefs tend to empathize with the source of the information first, trying to understand the information being conveyed.

Early research indicated that separate and connected ways of knowing were gender specific. However, more recently researchers found that both men and women utilize both separate and connected ways of knowing (Galotti, Clinchy, Ainsworth, Lavin & Mansfield, 1999; Ryan & David, 2003). Specifically, their research found that connected knowing was

higher when thinking of in-groups, whereas separate knowing was higher when thinking of out-groups.

New evidence further proposes that gender-related behaviors and cognition are highly variable, possibly dependent upon social context. Support for this proposal is based on self-categorization theory research (Turner, 1985; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) which suggests that attitudes and behaviors can change dynamically in relation to different social situations. Different social situations affect not only how one perceives themselves and themselves in relation to others, but can lead to the formation of attitudes and behaviors on the basis of in-group and out-group membership. In-groups are comprised of individuals perceived as sharing similar beliefs or common interests, whereas out-groups are comprised of individuals having dissimilar beliefs or interests. This social categorization can affect how knowledge is received, processed and judged dependent upon the nature of the group membership indicating an association between a person's uses of connected or separate ways of knowing.

What remains unanswered is does social context, i.e. in-group and out-group membership, affects one's use of separate knowing or connected knowing? First, this research will examine whether the relationship between the uses of separate or connected knowing is dependent upon social context (in-group or out-group). More specifically, will individual ways of knowing vary dependent upon the social context they have in mind. In other words, are ways of knowing domain general (stay the same across contexts) or domain specific (change across contexts)? Secondly, the research will examine the impact of gender in one's use of separate or connected knowing as proposed in earlier research.

Terminology

Epistemological Beliefs and Epistemological Belief System Theory. Epistemological beliefs refer to the beliefs one has regarding the nature of knowledge and learning. The Epistemological Belief System Theory (EBST), proposed by Schommer-Aikins (2004), is comprised of five components: stability of knowledge, structure of knowledge, source of knowledge, speed of learning, and ability to learn. The certainty of knowledge belief proposes that knowledge remains static over time or that knowledge is tentative and changes over time. The structure of knowledge belief proposes that knowledge is simply facts versus complex theories. The source of knowledge belief refers to whether one views knowledge as being handed down by an authority or learned by anyone. The control of knowledge belief refers to one's perceived ability to learn: either it is fixed at birth or changeable during one's lifetime. The speed of knowledge belief refers to if and how quickly one believes knowledge can be acquired. Schommer-Aikins summarily proposed these five beliefs do not necessarily develop simultaneously with each other. For example, a person could hold more sophisticated beliefs regarding the certainty of knowledge and less sophisticated beliefs regarding the control of knowledge.

Connected and Separate Knowing. In *Women's Ways of Knowing*, Belenkly, Clinchy, Goldberger, & Tarule (1986) identified two distinct ways of knowing when processing information: separate knowing and connected knowing. Separate knowing (SK) refers to the method in which learners distance themselves from the information source and instead rely on objectivity, logic, reason, analysis, and finally, evaluation. Connected knowing (CK) refers to the method in which the learner embraces the information source and approaches the knowledge from a viewpoint of understanding, empathy, and acceptance, and it is strongly collaborative in

nature. Belenky and her colleagues adamantly maintained that separate or connected knowing were not mutually exclusive or superior to one another, they were simply different.

In-Group and Out-Group Associations. In-group associations are defined as interactions between two or more people who define and evaluate themselves in a common self-inclusive category, and this group is recognized by at least one other person outside the group (Allport, 1954; Sherif, 1962). An out-group, in contrast, consists of people outside this defined group who are often viewed as competitors, enemies, or simply devalued as non-entities. According to the in-group bias phenomenon, in general in-group members are often viewed as not only different, but often superior and given preferential treatment to out-group members. Based on the social identify perspective (Hogg, Abrams, Otten, & Hinkle, 2004; Hogg & Tindale, 2005; Tajfel & Turner, 1979), intergroup behaviors are often characterized by in-group favoritism and out-group discrimination.

Social Identity Perspective. The social identity perspective advocates that a person's identity is based on a social categorization process in which a person constructs their identity based on how they see themselves and view themselves in relation to others (Hogg et al., 2004; Hogg & Tindale, 2005; Tajfel &Turner, 1979). In essence, one's self-concept and self-categorization is a derivative of the social groups and categories to which one belongs. There is usually some level of emotional significance or feelings associated with a particular group membership. The social cognitive processes, such as impression and stereotype formation, are often connected with promoting different types of group and intergroup behaviors associated with prejudice and discrimination.

Overview

This study will address two questions. First, do individuals vary their ways of knowing depending on the context they have in mind? In other words, will they have higher SK scores when thinking about an out-group and higher CK scores when they are thinking of an in-group? Second, are ways of knowing gender related? In other words, overall, will women have higher CK scores and men have higher SK scores?

The following chapters are outlined as follows: The first section of Chapter Two provides a brief review of initial research on epistemological beliefs (Perry, 1968) and subsequent research based on these findings (Baxter Magolda, 1992, 1985; Kitchener & King, 1981; Schommer, 1990, 1993, 1994; Schommer &Walker, 1997; Schommer-Aikins, 2004). The second section of Chapter Two provides a review of epistemological belief research focusing on gender domains (Belenky, et al., 1986; Galotti et al., 1999, 2001; Schommer, 1990; Schommer & Easter, 2006; Schommer-Aikins,2004), context specificity (Ryan & David, 2003), the social identity perspective (Hogg et al., 2004; Hogg & Tindale, 2005; Tajfel & Turner, 1979) and in-group/out-group associations, particularly how the activation of impression formation leads to social categorizations, ultimately affecting how one interprets, categorizes, remembers and recalls the actions and attributes of others (Gilbert, 1998).

Chapter Three presents the methodology that will be used in this study, including a description of the instrument utilized and demographics. Chapter Four will review the procedures for the collecting the data, analysis of the data, and summarization of the findings. Chapter Five will include a discussion of the findings and summary.

CHAPTER 2

LITERATURE REVIEW

The study of epistemological beliefs continues to evolve as educators and psychologists recognize their influence on one's educational experiences, inter-group behaviors, and career aspirations. For example, Jehng, Johnson, and Anderson (1993) found that graduate students were more likely to believe that knowledge is uncertain and incrementally developed. They also found that students in "soft" disciplines, such as philosophy, were more likely to believe that knowledge is uncertain, compared to students in "hard" disciplines such as mathematics. As a consequence of these beliefs, a student might choose engineering versus counseling as a career.

Early research has addressed six general issues surrounding epistemological beliefs including the developmental sequence (Kitchener & King, 1994; Perry, 1970), gender influences (Baxter Magolda, 1992; Belenky et al.,1986), moral thinking and reasoning process (King & Kitchener, 1994), epistemological belief components (Schommer, 2002, 1994), cognitive and motivational processes (Hofer, 1994; Ryan, 1984b, Schommer, 1990) and measurement tools for accessing development (Baxter Magolda & Porterfield, 1985). However, little research has focused on the context sensitivity (domain generality or domain specificity) of epistemological beliefs. This study tests the hypothesis that individuals will adjust their ways of knowing (i.e., separate knowing or connected knowing) based on in-group or out-group associative priming.

Background Knowledge – Basic Models of Epistemological Beliefs.

Perry's model. Research by William Perry (1968) with male college students attending Harvard University is recognized as the foundational research on epistemological beliefs and their influence on a student's academic approaches to learning. Perry developed a Checklist of Educational Views (CLEV) instrument to identify and quantify students' intellectual

development. Following the completion of the CLEV instrument, students completed additional in-depth interviews during their remaining college years. Perry's early research found that most students pass through a developmental sequence in regards to their views about the nature of knowledge, specifically the certainty, source, and structure of knowledge. The certainty of knowledge belief ranges from knowledge is consistent and static over time to knowledge is tentative and changes over time. The structure of knowledge belief ranges from knowledge is simply facts to knowledge is complex theories. The source of knowledge belief ranges from knowledge is handed down by an authority or knowledge is learned by anyone. Perry's interviews revealed that undergraduate students participating in his study viewed knowledge as simple and handed down by authority when they started as freshmen, but the students viewed knowledge as complex theories that anyone can learn by their senior year of college.

Perry (1968) ultimately concluded that students evolve through nine distinct positions as they progressed from simplistic views of knowledge to more complex levels of reasoning. Perry combined these positions into three stages as dualist, multiplist, and relativist perspectives. In the dualist stage, freshman students initially viewed knowledge as either right or wrong, absolute, universally certain, and handed down by higher authorities. In the multiplist stage, students believed information is neither right nor wrong, but subject to one's own opinion. By their senior year, students arrived at the relativist stage, recognizing that knowledge is uncertain and must be evaluated on an individual personal basis utilizing complex observation and reasoning skills.

Perry's research was able to identify a definite and sequential pattern of epistemological beliefs, however, there are several limitations to his work. The participants were largely composed of white, elite, male students; only two female students were identified. In addition,

all participants were volunteers from a single college and the investigators also served as interviewers collecting data. While Perry (1968) did not conduct further research or explore a link between epistemological development and student learning, he did hypothesize that changes in a student's views of the nature of knowledge and the role of authority might lead to changes in a student's method of learning. This hypothesis provides early speculation on a possible link between epistemological beliefs, cognitive styles, and social identity.

The reflective judgment model. Expanding on Perry's work, Kitchener and King (1981) proposed an alternative framework for studying beliefs about knowledge focusing on the different ways people evaluate ill-structured problems and the credibility of assertions. Ill-structured problems are characterized by uncertainty regarding the actual problem, goal achieved, or inherent goodness. For example, should a drug company provide life-saving drugs free to patients unable to pay? Or, is it fair for a person who committed a crime to avoid punishment due to a technicality? Based on fifteen years of interviews data with individuals from high school students to middle-aged adults, Kitchener and King (1981) proposed a sequential seven-stage Reflective Judgment Model which outlined the development of reflective judgment and a person's ability to systematically analyze and propose solutions to ill-defined problems.

Similar to Perry (1970), Kitchener and King (1981) proposed a linear and progressive stage model in which growth occurs from an immature viewpoint to a more complex mature understanding of a multiplicity of variables. In stages one to three, reasoning is based on the black and white omnipotence of authority figures. During these initial stages, if a news headline is reported on the television, it must be true. In stages four and five, uncertainties are recognized and authority figures are questioned, however, the final analysis and judgment relies on the

evidence presented. During these stages, the accuracy of the news headline and subsequent story might be questioned; however, the ultimate judgment is based on the facts presented. Reasoning in stages six and seven, accepts knowledge as uncertain and subsequent judgments are made after weighing the evidence. Again, in analyzing a headline news story, the plausibility of the facts and evidence are weighed, however, the ultimate outcome is balanced before rendering a final judgment.

Kitchener, King, Wood, & Davidson (1989) further proposed that the attainment of reflective judgment was a result of individual experiences attributed to one's age, home environment, and educational level. One's internal belief system regarding justifications and exclusionary circumstances was further viewed as a key component of one's ultimate reflective judgment level suggesting a possible connection between epistemological development and cognitive reasoning abilities. Limitations of the work of Kitchner and colleagues (1981) involve the possible biases in utilizing only college students and a lack of training among scorers of the Kitchener et al., epistemological beliefs interviews.

Historically, the works of Perry (1968, 1970) and Kitchener and King (1981) were similar in the fact they all followed a linear pattern of development beginning with a simplistic view of knowledge which transforms into a deeper understanding of the complexities involving reasoning and justifications. All proposed these changes were concurrent with age, maturity, and education level. However, none of the research studies focused on gender as a variable.

Epistemological reflection model. Baxter Magolda's (1992, 1985) work began as an attempt to quantify student's ways of thinking and build on the single-sex research initially undertaken by Perry (1970). Through the development of the Measure of Epistemological Reflection (MER), Baxter Magolda sought to study epistemological belief development and how

epistemological belief development affected educational experiences. By randomly selecting male and female students from Miami University in Ohio for this 5-year longitudinal study, Baxter Magolda was able to gain a more complete understanding of the gender similarities and differences.

By organizing student responses into categories and themes, Baxter Magolda (1992, 1985) identified four major stages of development: absolute, transitional, independent, and contextual. Each stage was composed of two different types of reasoning patterns – initial and transitional. Epistemological beliefs were initially absolute in which knowledge is perceived as certain and authority driven. In the transitional stage, only some knowledge is believed certain and the authorities are not all-knowing. In the independent stage, knowing is categorized as uncertain and based on individual beliefs; authority is viewed only as a knowledge source. Finally, in the contextual stage, knowledge is dependent upon a judgment of the evidence and the domain specificity of the situation.

Baxter Magolda's (1992, 1985) research found two gender-related reasoning patterns each for the first three stages. Within absolute knowing, receiving (utilized more by women) and mastery (used more by men) patterns were defined. With transitional knowing, women were more likely to use an interpersonal knowing style and men were more likely to use an impersonal knowing style. With independent knowing, women were more likely to use an "interindividual" style and men were more likely to use an "individual" style. Baxter Magolda further acknowledged the connected, narrative approach more common to women as both complex and equal to the objective approach more common to men. In summary, stages of epistemological belief development reasoning patterns were found to be gender related, but not gender specific. Limitations to Baxter Magolda's study was the use of mostly white, middle-class, two parent

students from a single university limiting the applicability of the results to more diverse, multicultural populations.

Epistemological belief system theory. Influenced by earlier research, Schommer (1990) re-conceptualized epistemological beliefs into five independent dimensions known as the Epistemological Belief System Theory (EBST). Schommer proposed epistemological development was a distinct set of beliefs that developed independent of each other and consisted of five components: stability of knowledge (tentative to unchanging), structure of knowledge (isolated to integrated), source of knowledge (authority to observation and reasoning) speed of learning (quick or gradual), and control of learning (fixed at birth or lifelong improvement). Schommer further challenged Perry's (1970) notion that epistemological beliefs followed a fixed development sequence. Through the development of the Epistemological Beliefs Questionnaire, Schommer (1993) was able to quantify the different epistemological belief components. This 63 item questionnaire of short statements characterizes epistemological beliefs using a Likert scale from 1 (strongly disagree) to 5 (strongly agree). Key aspects of Schommer's (1993) research examined how epistemological beliefs and approaches to studying relate to academic performance and attitudes toward learning. Differences in beliefs during high school years indicated a linear trend in all epistemological beliefs, except fixed ability from freshman to senior year. In the same study, epistemological beliefs also predicted grade point average (GPA), and gender differences were found in that women were less likely to believe in fixed ability or quick learning.

Of special interest was Schommer's (1994) finding that the higher amount of education a person received, the more likely they were to believe that knowledge was tentative and subject to interpretation. Further research showed that epistemological beliefs can influence

comprehension and test performance (Schommer et al., 1992; Schommer & Walker, 1997; Schommer-Aikins, 2004). For example, higher test confidence and better performance were negatively correlated with a belief in simple knowledge. The more students believe the ability to learn can improve, the more likely they are to persist in difficult academic tasks. Additional research associated with EBST identified an individual's age, amount of education, and parental educational level as influential in the development of epistemological beliefs (Schommer, 1990, 1993, 1998; Schommer-Aikins, 2004). Students growing up in families encouraging more independent decision making and responsibilities viewed knowledge as more complex and changing.

Schommer-Aikins furthered the advancement of epistemological beliefs in two critical areas. Foremost, Schommer-Aikins's research proposed the multidimensional, complex composition of epistemological beliefs. Secondly, her research suggested the development of epistemological beliefs were not necessarily simultaneous, but development in the different dimensions can occur independent of each other. For example, an individual could believe that knowledge is complex (sophisticated belief) yet also believe that knowledge is unchanging (unsophisticated belief). Sophisticated beliefs are thought to support higher order thinking, whereas, unsophisticated beliefs are indicative of less mature thinking. In Schommer-Aikin's (2002, 2004) more recent work, covered later in this literature review, she and her colleagues expanded their research into the past work of Belenky et al., (1986) focusing on ways of knowing, specifically on connected knowing, and separate knowing.

In summary, the initial works of Perry (1970), Kitchener & King (1994), Baxter Magolda (1992), and Schommer (1990, 1993, 2004) were instrumental in defining the structure and acquisition of epistemological beliefs. Although their individual models differed in

nomenclature, all proposed that college students' thinking progressed from simple thinking to a complex reasoning. They further concluded the importance of education and family dynamics as key elements of the formation epistemological beliefs. However, the identification of one's gender, social context and group association as a possible variables influencing epistemological beliefs was absent or minimally addressed.

Models Focusing on Identification of Gender Domains and Context Specificity.

Women's ways of knowing. Seeking to determine if women's ideas of knowledge were similar to men, Belenky et al. (1986) examined the epistemological beliefs of women. While Perry's (1970) earlier research involved only men, he claimed women's responses could be mapped into the patterns of development he identified. Belenky et al. questioned whether this assumption was valid. Using the interview framework supplied by Perry, Belenky et al. conducted semi-structured interviews of 135 women enrolled in six different colleges and human service organizations. However, upon analysis of their responses Belenky et al. recognized the women's responses simply did not fit into Perry's scheme. Consequently, Belenky and her colleagues devised their own classification system from which women know and view the world that included notions of voice, truth, and knowledge.

Belenky et al. (1986) ultimately proposed four types of knowledge perspectives: received, subjective, procedural, and constructed. Despite the lack of fit with Perry's scheme, Belenky et al. acknowledged similarities existed between the two theories. They concluded *received* knowledge was similar to Perry's *dualism* as both promoted knowledge as a set of facts handed down by authorities. *Subjective* knowledge, characterized by putting one's beliefs above the ideas of authorities, was also viewed as similar to Perry's *multiplicity*, however, women

ascertained a more modest position of "It's just my opinion" versus "I have a right to my opinion."

The knowledge perspectives that Belenky et al. identified as *procedural* and *constructed knowledge* consisted of cognitive methods for evaluating competing knowledge claims. Procedural knowledge involves the context specific systematic interpretation of knowledge to arrive at multiple meanings. Women were found to use two alternative methods involving procedural knowledge: connected knowing (CK) and separate knowing (SK). CK is a more inclusive way of knowing in which the person truly seeks to understand another person's perspective in an empathic, personal manner. SK is a more adversarial, challenging way of knowing in which the person is objective and impersonal, critically looking for flaws in which to discount another's opinion. While CK and SK can be viewed as opposing terms, Belenky et al. insisted that the two ways of knowing were not mutually exclusive. Instead they proposed the two ways of knowing could simultaneously exist within the same individual, foreshadowing the issue of domain specificity and domain generality. Constructed knowledge also incorporates CK and SK ways of knowing. However, people utilizing this methodology ultimately understand that people construct all knowledge and are personally responsible for its development and interpretation.

Belenky et al.'s (1986) identification of CK and SK knowing styles was a significant leap forward in understanding individual cognitive processing styles and their potential impact on intergroup attitudes and behaviors. Their research further acknowledged an intimate tie between epistemological beliefs and social relationships. Limitations to Belenky et al.'s early work involve their use of women only as participants thus limiting the gender-related aspect of their

findings. Other major conceptual differences between Perry (1970), involves Belenky et al.'s focus on the *source* of knowledge versus Perry's focus on the *nature* of knowledge.

Embedded System Model. Introduced earlier, Schommer-Aikins (formerly Schommer) (1990) and her conceptualization of the Epistemological Belief System Theory (EBST) as multidimensional and asynchronous was instrumental in moving the research in epistemological beliefs forward. In 2004, Schommer-Aikins further proposed the need for an embedded systemic model of epistemological beliefs that encompasses other aspects of cognition influencing one's beliefs (i.e. thoughts, actions, and motivations) as conceptualized by Belenky et al. (1986). Proposing three basic system influences, family, friends, and teachers, on a learner's life, Schommer-Aikins proposed that learners develop a *reciprocal interaction* or *feedback mechanism* which influences their beliefs. These environmental interactions on ways of knowing (i.e. CK and SK) highlight the importance of context sensitivity.

Focusing on academic implications, Schommer-Aikins and Easter (2006) continued research on the combined effects of ways of knowing, specifically CK and SK, and epistemological beliefs. Schommer-Aikins and Easter sought to further identify how these factors relate to age, gender, academic level and academic success. Results of this research found gender differences only in beliefs about separate knowing in contrast to earlier research by Galotti et al. (1999) which found gender differences in connected knowing. Due to the high percentage of Asians in the sample from a typically collectivist culture, Schommer-Aikins and Easter proposed that connectedness was essential for both men and women based on cultural influence. These findings also support earlier claims by Galotti et al. (1999) and Belenky et al. (1986) that both SK and CK ways of knowing enhance learning. This research further showed

that most people are capable of both ways of knowing, however they may show a preference for SK over CK or vice versa.

Gender and ATTLS. Galotti and her colleagues (1999, 2001) have continued research on CK and SK ways of knowing seeking to further identify gender related differences in the way people acquire, process, and judge information. Galotti et al. were somewhat skeptical of the gender related claims suggesting women as connected knowers and men as separate knowers gathered from earlier interview data (Baxter Magolda, 1992). The sampling in earlier research may have skewed the results. For example, in Perry's (1970) research with predominantly males, social relationships were not emphasized. However among the women Belenky et al. (1986) interviewed, social relationships were found to be an important component of personal epistemological beliefs.

In order to investigate gender issues, Galotti et al. (1999) developed the Attitudes Toward Thinking and Learning Survey (ATTLS), a 50-item questionnaire designed to measure CK and SK ways of knowing. Both male and female students from four colleges were asked to respond to 50 intermixed statements (25 each) measuring CK and SK. Students responded to CK statements such as: "I try to think with people instead of against them," and SK statements such as: "I like playing the devil's advocate – arguing the opposite of what someone is saying." Responses were rated based on a Likert scale from 1 (strongly disagree) to 7 (strongly agree). Totals were calculated for each way of knowing with a potential range of 25 to 175. Inter-item correlations for each scale were .83 for the SK scale and .76 for the CK scale, establishing acceptable levels of inter-item reliability. Additional information on the ATTLS instrument and psychometric properties will be covered in Chapter 3.

Results from this research suggested that the two ways of knowing were not mutually exclusive. Galotti and her colleagues (1999, 2001) did find consistent gender differences in the two types of scores. Although females showed significantly higher CK scores than SK scores, males CK scores and SK scores were not significantly different from each other. These results indicate that women and men differ in their attitudes toward learning and knowledge in complex ways.

Context Specificity. Ryan and David (2003) challenged the notion of stable, gender related differences in ways of knowing. Their research also focused on the domain specificity and domain generality of epistemological beliefs, specifically involving ways of knowing and the utilization of CK and SK knowing styles dependent upon social context (i.e. in-group or out-group). While numerous studies have addressed the tentative relationship between general and domain specific personal epistemologies, the results have been inconsistent and the debate continues. In a review of 19 empirical studies focusing on general and specific domains, Muis, Bendixen, and Haerle (2006) found evidence for both sets of beliefs that point to an interactive relationship between the two. While students may hold disparate beliefs in different domains, these domain-specific beliefs may loosely correlate with an overall set of domain-general beliefs. Schommer & Walker (1997) and Schommer-Aikins (2002) found empirical support for domain generality. Hofer (2004) found evidence to support the domain specific stance. Ryan and David hypothesized that men and women are not destined to only utilize SK and CK, respectively, but rather that both men and women are capable of entertaining both ways of knowing. Indeed, the most mature individuals will balance their ways of knowing depending upon social context.

Ryan and David (2003) tested this hypothesis by priming individuals' thinking in a way that would make the context more conducive to either relating to others (in-group) or challenging

others (out-group). Based on social psychology research, reflections on group membership could provide such a context. When individuals think about groups that are like them (in-groups) they are more likely to attribute positive stereotypes and favor the members (Hogg et al., 2004; Hogg & Tindale, 2005; Tajfel & Turner, 1979). When individuals think about groups that are not like themselves (out-groups), they are more likely to attribute negative stereotypes and are more likely to disfavor the members (Hogg et al., 2004; Hogg & Tindale, 2005; Tajfel & Turner, 1979). With these contexts in mind, Ryan and David constructed a study to prime individuals and then assess their ways of knowing.

Ryan and David (2003) assigned 267 participants into three groups. Each group was asked to either think about an in-group membership, out-group membership, or gender membership. An in-group is defined as any group of two or more people who see themselves different from non-members who are in turn, recognized by members outside their group. In-groups are essentially people with whom they share common interests, beliefs, or goals. An out-group consists of people outside this defined group, and are often defined as competitors, enemies, or simply devaluated as non-entities. Participants in the in-group context were asked to "list five groups that you belong to," choose one of these groups, and then "list five things that you share with members of this group." Participants in the out-group context were asked to "list five groups you do not belong to," choose one of these groups, and then "list five things that distinguished you from members in this group." Participants in the gender context were asked to "list five gender differences that you would be interested in studying, choose one of these differences, and then to "list five things you believe cause this difference in behavior."

After priming the participants regarding their in-group, out-group, or gender associations, all completed the shorter 20-item ATTLS (Galotti et al., 1999) which measures individual ways

of knowing. These results revealed SK and CK were dependent on social context, but not gender. No gender differences were significant for CK, however, gender differences were significant for SK with men showing overall higher scores than women. These results demonstrated how SK and CK ways of knowing are variable dependent upon both gender and social context.

Their study served as an initial test of the domain specificity or domain generality of ways of knowing. However, a stronger test is needed. In their study, two different groups of people were in the different priming conditions. Hence, one cannot conclude that individuals will actually change the balance of their ways of knowing when the conditions change. The current study will test this by having one group of individuals experience the in-group condition followed by the ATTLS ways of knowing assessment. Then, two weeks later the same group will experience the out-group condition followed by the ATTLS ways of knowing assessment. In this way, it can be determined whether individuals actually shift the balance of their ways of knowing depending upon the priming context. Analysis will also be conducted to reconfirm that ways are knowing are gender related.

The need to understand the interaction effect of one's epistemological beliefs, specifically involving CK and SK, social categorization, and in-group and out-group behaviors is of significant importance when understanding group interactions. This proposed research is a more stringent test of the stability or adaptability of an individual's use of CK and SK.

As follow-up to the between-subject research design outlined by Ryan and David (2003) which researched three different groups of participants' use of connected and separate knowing when thinking either of in-group, out-group, or gender, this research will be a within-subject design. A single group of participants will be asked to focus on in-group when completing the

initial survey and out-group when completing the second survey. This study will serve as a stronger test of individuals' adaptivity in ways of knowing or determine if ways of knowing are moderately stable across social contexts.

This research will test the following three hypotheses: (a) There will be an interaction effect between ways of knowing CK and SK scores and in-group/out-group priming conditions; (b) Women will have higher CK scores than men; and (c) Men will have higher SK scores than women.

CHAPTER 3

METHODS

Participants

Participants in this study were college students from education, engineering, health professions and social science majors enrolled in seven different classes at a university in a Midwestern city. Demographic data was obtained based on the completion of a short survey (see Appendix A). There was a total of 123 participants (Female = 87, Male = 36). The participants' age range was 17 to 67 years old (M=29.3; S.D=9.09). Participants' ethnicity was reported as 78% Caucasian, 10.6% Asian, 5.7% African-American, and 5.7% Hispanic or Latino. Participants included both undergraduate and graduate students reported as 8.1% sophomore, 16.3% junior, 19.5% senior, 40.7% working on Masters, 1.5% working on Specialist, 0.8% working on Doctorate, and 13% Other. The Other category was composed primarily of students obtaining a secondary degree. The 23 reported academic majors were classified and reported as 62.6% in Education, 20.3% in Health Professions, 12.2% in Engineering, and 4.9% in Social Sciences. English was the primary language in 91% of the participants. All participants were volunteers.

Instruments

Attitudes Toward Thinking and Learning Survey (ATTLS). Ways of knowing was assessed using the ATTLS instrument (Galotti et al., 1999) (see Appendix D). This instrument (shortened from the original 50-item version) consists of 10 statements from a connected way of knowing (CK) perspective and 10 statements from a separate way of knowing (SK) perspective. For example, "I am always interested in knowing why people say and believe the things that they do" represents a connected way of knowing statement. "It's important for me to remain as

objective as possible when I analyze something" represents a separate way of knowing statement. Responses were rated on a Likert scale from 1 (strongly disagree) to 7 (strongly agree). The 10 CK and 10 SK items were totaled separately, resulting in a potential range of scores for each type of knowing from 10 to 70. The ATTLS inter-item correlations for each scale was .83 for the SK scale and .76 for the CK scale, establishing acceptable levels of internal reliability (Galotti et al., 1999).

Demographics. Participants completed a brief pencil and paper demographic questionnaire to assess the following: gender, age, ethnicity, primary language, year in school, and academic major (see Appendix A). The demographic information gathered provided a clear description of the participants. For example, gender information was asked to analyze gender differences. English as a primary language was asked to ensure participants understand the questions.

Materials

Informed consent. Following the protocol as outlined by the Wichita State University Institutional Review Board (IRB) for the Protection of Human Subjects, consent forms were provided and signed by all participants and will be retained for three years (see Appendix B). Student personal identification information was solicited on the informed consent for each priming condition. Once the student in-group and out-group priming responses were linked, the student identification information was removed from the data base.

Priming of participants. Participants were primed to stimulate the cognition of their respective in-groups or out-groups. The participants were asked to select three groups that were MOST like them (or LEAST like them) from a pre-selected list of 20 groups and associations or generate three groups that the undergraduate and graduate college students could relate to. The

20 groups listed reflect ten groups that might be thought of as adversarial to stimulate SK ways of knowing and ten groups that might be thought of as cooperative to stimulate CK ways of knowing (see Appendix C). For example, debate and chess might be considered activities requiring objective and detached traits associated with separate knowing, whereas, music and theatre might be considered activities requiring considerate and compassionate traits associated with connected knowing. Providing groups for participants was a recommendation based on comments from earlier research (Burrows, personal communication, April 15, 2008) mentioning the inability of participants to call to mind specific in-groups and out-groups.

Following the selection of three groups that are MOST like them (or LEAST like them), the participant selected one group from the three that they selected and place an asterisk (*) by that group. To encourage deeper processing of the group association, the participants then described five reasons why they are LIKE (or NOT LIKE) the asterisked group. This priming exercise was based on earlier CK and SK ways of knowing research by Ryan and David (2003). However, while Ryan and David asked participants to select five groups, this research asked participants to select only three groups to lessen cognitive load. Following the completion of the priming exercise, participants then turned the page and completed the ways of knowing instrument, Attitudes Toward Teaching and Learning Survey (ATTLS) (Galotti et al., 1999).

Experimental booklets. Two different colored sets of booklet forms were constructed to prime participants in the "LIKE ME" priming and "NOT LIKE ME" priming conditions. Materials in each set were presented in the following order: (a) Informed Consent (b) Contextual Priming, (c) ATTLS, and (d) Demographics. One booklet had the "LIKE ME" in-group contextual priming (blue colored set of forms) and the other booklet had the "NOT LIKE ME" out-group contextual priming (green colored set of forms). An assembled colored set of each

"LIKE ME" and "NOT LIKE ME" priming condition booklet forms is attached (see Appendices E & F).

To avoid order effect as a confounding variable, participants with birthdays falling between January and June completed the "LIKE ME" in-group survey first (blue colored booklet forms). Participants with birthdays falling between July and December completed the "NOT LIKE ME" out-group survey first (green colored booklet forms). One week later the survey order was reversed. Participants with birthdays falling between January and June completed the "NOT LIKE ME" out-group survey (green colored booklet forms) and participants with birthdays between July and December completed the "LIKE ME" in-group survey (blue colored). Each survey took ten to fifteen minutes for completion.

Procedure

The researcher read the survey instructions and administered the pencil and paper surveys to participants twice, within a one week interval (see Appendix G). The researcher advised students that they were invited to participate in a study on communication styles and dealing with people. The researcher further advised the students that they were selected to help understand the insights of students taking college classes. The researcher lastly advised the students that their participation was voluntary and all information would remain completely confidential. All forms of participant identification were removed from the data base once the two surveys were linked. It was at the discretion of the instructor to offer extra credit or other compensation.

Following the survey instructions, the researcher then asked the students if they had any questions. If not, the booklets were distributed based on the appropriate color coding by birth

date outlined in the Materials, Experimental Booklet section. The researcher further stipulated that all forms in the booklet must be completed in the order presented.

The researcher was present during the administration of each survey for each class. The researcher picked-up the completed survey forms immediately after their completion.

Data Analysis

Descriptive statistics. Descriptive statistics of participant's demographic information was completed to provide a detailed description of the sample size. These statistics were used to update the participant section of this research study. All data obtained was entered by the researcher and verified for accuracy by the departmental graduate assistants.

Psychometric properties of ATTLS. The following descriptive statistics were ran for each of the 10 CK and SK items: mean, standard deviation, range, and skewness. Each set of the 10 items for CK and SK respectively were analyzed for inter-item reliability using Cronbach alpha. An inter-item reliability of .70 or higher would be considered acceptable (Field, 2009).

MANOVA analysis to test hypothesis. A multivariate analysis of variances (MANOVA) using SPSS was conducted to answer the research questions using a 2 (gender: female vs. male between group) X 2 (priming condition: LIKE ME vs. NOT LIKE ME within group) X 2 (ways of knowing: CK vs. SK within group) analysis. Gender and priming condition are the independent variables. Ways of knowing are the dependent variables. This analysis tested the hypothesis of an interaction effect between priming condition and ways of knowing to answer the following questions: Will SK be significantly higher than CK in the NOT LIKE ME priming condition? And, will CK be significantly higher than SK in the LIKE ME priming condition? This analysis also tested the hypothesis of a main effect for gender and answered the

following questions: Will men have a significantly higher SK score than women? And, will women have a significantly higher CK score than men?

Summary of data analysis. The following statistical evidence are reported in the results: (a) Descriptive statistics for each item in ATTLS, (b) Cronbach alphas for each CK and SK measure, and (c) Descriptive statistics for variables included in the MANOVA.

If Ryan and David's (2002) hypothesis is tenable, CK scores will be higher than SK scores in the in-group priming condition and SK scores will be higher that CK scores in the out-group priming condition. The strongest support of their hypothesis is that these results will be the same for both men and women. That is, both genders modify their ways of knowing dependent upon the context.

In addition, it was also hypothesized that the overall scores for SK and CK will be gender related. That is, in general men will have higher SK scores compared to women and women will have high CK scores compared to men.

CHAPTER 4

RESULTS

The results of the data analysis are presented in this chapter. This research addressed the following research questions: (a) Will SK be significantly higher than CK in the NOT LIKE ME priming condition?; (b) Will CK be significantly higher than SK in the LIKE ME priming condition? ; (c) Will men have a significantly higher SK score than women?; and (d) Will women have a significantly higher CK score than men

Descriptive Analysis

A preliminary analysis of each of the 10 statements representing CK and 10 statements representing SK for both in-group and out-group priming conditions (40 items total) was conducted to examine the following descriptive statistics: mean, standard deviation, range, and skewness (see Appendix H). The mean scores of the 40 items ranged from 2.92 to 5.95 showed adequate variability in responses. The range of skewness for all 40 items was -1.60 to 0.58. Inter-item reliability using Chronbach's Alpha was reported greater than the .70 acceptable range (see Table 1). In summary, all psychometric properties were acceptable.

Table 1

Descriptive Statistics by Priming Condition

Ways of Knowing and Priming Condition	Mean	SD	Cronbach Alpha
CK In-Group	53.79	7.10	.78
SK In-Group	42.65	8.23	.72
CK Out-Group	52.33	8.55	.85
SK Out-Group	42.81	8.59	.74

Testing Research Hypothesis

A MANOVA was performed using a 2 (gender: man vs. women between group) X 2 (priming condition: LIKE ME vs. NOT LIKE ME within group) X 2 (ways of knowing: CK vs SK within group) analysis to answer the first and second research questions: (a) Will SK be significantly higher than CK in the NOT LIKE ME priming condition? (b) Will CK be significantly higher than SK in the LIKE ME priming condition. Gender and priming condition were the independent variables. Ways of knowing were the dependent variables. These two questions were addressed by examining the interaction effect between WOK and priming condition. Results from the MANOVA showed no significant interaction effect between WOK and priming condition ($F(1,121) = 3.30$, $p > .05$, $\eta^2 = .03$). In summary, these two hypotheses were not supported.

The two questions: (a) Will men have a significantly higher SK scores than women? and (b) Will women have a significantly higher CK score than men? were addressed by examining the interaction effect between WOK and gender. Results from the MANOVA showed a main effect for gender ($F(1,121) = 12.32$, $p < .01$, $\eta^2 = .09$). More importantly, a significant interaction effect was found between WOK and gender ($F(1,121) = 43.35$, $p < .01$, $\eta^2 = .76$). In order to investigate this interaction, a follow-up post hoc analysis was conducted. A significant difference for SK was found ($F(1,121) = 52.17$, $p < .01$, $\eta^2 = .30$). However, there was no significant difference for CK. In summary, one hypothesis was supported, that men will have significantly higher SK scores than women. However no significant difference was found in CK scores between men and women (see Table 2).

Table 2
Descriptive Statistics for Ways of Knowing by Gender

Ways of Knowing and Gender		Mean	Std. Error
Female	Connected Knowing	53.76	0.75
	Separate Knowing	39.97	0.71
Male	Connected Knowing	51.36	1.17
	Separate Knowing	49.40	1.10

Contrary to Ryan and David's (2002) hypothesis that CK scores would be higher than SK scores and the in-group priming condition and SK scores will be higher than CK scores in the out-group priming condition, this research did not confirm a statistical significance between the use priming condition and ways of knowing scores. Neither gender modified their ways of knowing dependent upon the context.

Overall, this research did confirm a gender relationship in the two types of scores confirming the two ways of knowing can be advocated, that is, people can utilize both ways of knowing at some point in time. Men did have significantly higher SK scores compared to women, however, there was no significant difference in CK scores between men and women. This finding is consistent with Gallotti and her colleagues (1999, 2001). These results further indicate that women and men differ in their attitudes toward learning and knowledge in complex ways.

CHAPTER 5

DISCUSSION

Overview of the Study

Personal epistemology and the formation of epistemological beliefs continue to be a developing area of interest among researchers and educators. Specifically, research focusing on how individuals develop and maintain their beliefs about knowing and the impact of these beliefs on cognition and reasoning is of particular interest. The focus of this research was to determine if people adapt a particular form of epistemological beliefs, specifically ways of knowing, dependent upon social context (i.e. people one relates to versus people one does not relate to).

Beginning with Perry (1968), the early models of epistemological belief research focused on the structural and developmental sequences of epistemological beliefs. Further research by Kitchner & King (1994) focused on how epistemological assumptions influence the thinking, reasoning and reflective judgment processes individuals employ when justifying their beliefs about ill-structured problems.

Building on these developmental models, Schommer (1990) expanded the focus of epistemological beliefs to include how these beliefs influence comprehension, academic performance and attitudes toward learning. As a consequence of this research, she conceived the term "epistemological belief system" to encompass the intricacy of epistemological beliefs. Comprised of five dimensions: structure, certainty, source of knowledge, control of knowledge acquisition, and speed of knowledge, she proposed these dimensions developed independently and non-linearly. Numerous other research studies have embraced this concept, to include research on academic achievement (Dweck & Leggett, 1988) and multiple aspects of learning (Hofer, 2004).

Additional research by Belenky et al. (1986) focused on one aspect of personal epistemology, ways of knowing, which refers to the methodology one employs to evaluate and construct knowledge in social interactions. Belenky and her colleagues defined two ways of knowing, specifically, connected and separate knowing, which employ very different methodology to reach an evaluative decision. Individuals with more dominant separate knowing beliefs initially question, doubt, and are critical of the information received, whereas, individuals with more dominant connected knowing beliefs try to understand the information and empathize with the source of the information.

While earlier research indicated separate and connected ways of knowing were gender specific, subsequent research by Galotti et al. (1999), Clinchy (2002), and Ryan and David (2003) found that both men and women utilize both separate and connected ways of knowing. Specifically, Ryan and David's research found connected knowing was higher when thinking of in-groups whereas separate knowing was higher when thinking of out-groups. Based on self-categorization research (Turner, 1985; Turner et al., 1987), new evidence further proposes that gender-related behaviors and cognition are highly variable, possibly dependent on social context. Different social situations affect not only how one perceives themselves and themselves in relation to others, but can also affect the formation of attitudes and behaviors based on in-group and out-group membership.

This research was conducted to further evaluate gender-related differences and whether different social situations affect how knowledge is received, processed and judged dependent upon in-group or out-group membership. Specifically, does social context affect one's use of separate knowing or connected knowing? In other words, are ways of knowing domain general

(stay the same across contexts) or domain specific (change across contexts). Secondly, this research examined the impact of gender in one's use of separate or connected knowing.

Discussion and Reflection

This research supported one hypothesis proposed between gender and ways of knowing. SK scores were found to be significantly higher in men compared to women. However, CK scores were not found to be significantly different in women compared to men. This finding supported the works of Belenky et al. (1986) and Galotti et al. (1999, 2001) which found consistent, although not mutually exclusive, gender differences in ways of knowing, specifically separate knowing and connected knowing. Overall, men tended to play the devil's advocate, doubting and questioning new ideas, whereas women were empathetic initially, embracing others' position, before engaging in further evaluation.

Clinchy's (2002) later research expanded the gender implications by proposing that individuals are capable of both ways of knowing dependent upon the situational demands. She further implied higher order thinking required flexible use of ways of knowing depending upon context. While this research confirmed the gender relationship between ways of knowing, the use of cognitive flexibility dependent upon context specificity was not confirmed.

This study did not support the two research questions proposed between the priming condition and ways of knowing. SK scores were not found to be significantly higher in the out-group NOT LIKE ME priming condition, nor were CK scores found to be significantly higher in the in-group LIKE ME priming condition. Therefore, the present findings did not provide support for Ryan and David's (2002) original hypothesis that SK scores would be significantly higher in the out-group priming condition and CK scores would be higher in the in-group

priming condition. Neither gender modified their ways of knowing dependent upon the context specificity.

While a number of reasons may have contributed to the lack of support for Ryan and David's (2002) earlier research, the smaller sample size (N = 123) versus their larger sample size (N = 267) may have been a factor. The timing between the two priming conditions may have also been a contributing factor. While their research stipulated a two week interval between the administration of the priming condition and ways of knowing questionnaire, this research was completed within a week of each condition. Participants may not have had enough time to allow for separation between the two priming conditions. Further research is needed to see whether the present findings can be replicated.

Limitations

The present study was subject to several limitations. First, the participants were not randomly chosen, but were volunteers attending summer classes from three colleges within Wichita State University: College of Education, College of Engineering, and College of Liberal Arts and Sciences. While this diversified composition could be construed as strength of the study, it may have contributed to an unanticipated confounding variable. Unfortunately, the sample size for each college group was too small to make further investigations meaningful. Secondly, while not statistically significant, there was a higher number of female than male participants, making conclusions about gender differences in this study somewhat tentative. Lastly, while an attempt to control for a lack of cooperation among participants was implemented by eliminating inadequately or partially filled out questionnaires, this factor could have also influenced the results.

Implications for Future Research

The present study has a number of implications for future research. First, the study needs to be replicated with a larger, more heterogeneous sample. This would allow the results to be generalized to the larger United States population. Secondly, the participants from this study were enrolled in three colleges, representing over 23 different major choices. As educational programs selection is known to affect epistemological beliefs (Jehng et al., 1993), future research could focus on the relationships between these different academic areas and epistemological beliefs. Finally, the question of domain specificity remains an important, yet unconfirmed, hypothesis. Further research would clarify support for this hypothesis or allow for new considerations.

The present findings also have implications from a multicultural perspective. As the diversity of the United States population continues to increase, the relationship between ways of knowing dependent one's in-group or out-group affiliation and domain specificity becomes increasingly more complex. Further evaluation to determine whether an association exists between bi-cultural competence and sensitivity to context would be worth pursuing. For teachers, increasing cultural awareness might result in a student's overall awareness, perception and responsiveness to diversity issues, resulting in increased contextual sensitivity across a multitude of domains.

Epistemological beliefs and ways of knowing are critical to learning, and are affected by the cultural diversity that exists within educational environments (Hofer & Pintrich, 1997; Schommer-Aikins & Easter, 2006). The ability to recognize and synthesize these inter-related variables is paramount if educators are to enhance classroom curriculum, achieve optimum teaching environments and provide students with an increased awareness of cultural differences.

Long-term, students will be able to transfer this increased knowledge and use of cognitive flexibility to other areas of their adult life.

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APPENDICES

APPENDIX A

Basic Demographics and Background Survey

Please provide the following demographic information.

1. Name: _____
2. WSU ID Number: _____
3. What is your sex?

   ○ Male ○ Female

4. What is your age? _____
5. What is your ethnicity?

   ○ Caucasian or White ○ Asian

   ○ African American or Black ○ Hispanic or Latino

   ○ American Indian or Alaskan Native ○ Native Hawaiian or Pacific Islander

6. What is your academic major (e.g. Elementary Education, Math Education, Counseling, Educational Psychology)? _____
7. What is your highest level of education?

   ○ Freshman ○ Working on Masters ○ Other (specify)

   ○ Sophomore ○ Working on Specialist _____

   ○ Junior ○ Working on Doctorate

   ○ Senior ○ Doctorate Complete

8. Is English your primary language?

   ○ Yes ○ No

Thank you for completing the survey.

APPENDIX B

INFORMED CONSENT

You are invited to participate in a study on communication style and dealing with people. Since ways of interacting and discussing issues may vary, true insight comes from obtaining many viewpoints. Your class was randomly selected as a source of possible participants in this study, since our goal is to understand the insights of students taking college classes. We are expecting to have about 60 participants in this study.

If you decide to participate you will be asked to complete two short surveys that will take about 10-15 minutes each to complete. You will be asked to take the surveys on two different days. The survey explores your thoughts on communication style and dealing with others. Your responses will remain anonymous and confidential. This information will help us understand college students' perspectives, which inform future college professors in their instruction.

No risks are anticipated in this study. All information will remain completely confidential and anonymous. All forms of ID will be removed from the data base.

Participation in this study is entirely voluntary. Your decision on whether or not to participate will not affect your future relations with Wichita State University. If you agree to participate in this study, you are free to withdraw from the study at any time without affecting your status as a student.

If you have any questions about this research, please ask us. If you have additional questions during the study, we will be glad to answer them. You can contact us, Margaret Phillips or Marlene Schommer-Aikins, at Wichita State University, Wichita, KS (316-978-3326). If you have questions pertaining to your rights as a research subject, or about research-related injury, you can contact the Office of Research Administration at Wichita State University, Wichita, KS 67260-0007, telephone 316-978-3285.

You will be offered a copy of this consent form to keep.

You are making a decision whether or not to participate. Your signature indicates that you have read the information provided above, and have voluntarily decided to participate.

_____ _____
Signature of Research Participant Date

_____ _____
Signature of Investigator (Marlene Schommer-Aikins) Date

_____ _____
Signature of Investigator (Margaret Phillips) Date

APPENDIX C

Contextual Priming of Participants

Take a moment and think about people LIKE (or alternative form UNLIKE) yourself.

1. **Select** three (3) groups of people from the following list **OR generate** three (3) groups of your own that you relate to the most (or least) and write these groups below.

Debate Team	Competitive Athletes	Sorority/Fraternity	Book Club
Science Club	Parent Teacher Organization	Cooking Club	Musicians
Chess Club	Physical Fitness Club	School Affiliation	Speech Club
Sports Fans	Religious Affiliation	Gardening Clubs	Theatre Group
Ethnicity	Political Affiliation	Academic Major	Martial Arts

2. List your three groups here:

3. Then choose one of these groups and place an asterisk * by the group.

4. Then list five (5) things that make you LIKE (or alternative form UNLIKE) members of this group.

APPENDIX D

The Attitudes Toward Thinking and Learning Survey

Directions: In this survey we are asking for your opinion about thinking and learning and how this relates to human interaction. Answer the questions based on your own opinion. Simply select the degree of agreement you have to each statement based on the following scale. Give the first response that comes to your mind.

Strongly Disagree	Somewhat Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Somewhat Agree	Strongly Agree
1	2	3	4	5	6	7

___ 01 I like playing devil's advocate-arguing the opposite of what someone is saying.

___ 02 It's important for me to remain as objective as possible when I analyze something.

___ 03 When I encounter people whose opinions seem alien to me, I make a deliberate effort to "extend" myself into that person, to try to see how they could have those opinions.

___ 04 I can obtain insight into opinions that differ from mine through empathy.

___ 05 I tend to put myself in other people's shoes when discussing controversial issues, to see why they think the way they do.

___ 06 In evaluating what someone says, I focus on the quality of their argument, not on the person who's presenting it.

___ 07 I find that I can strengthen my own position through arguing with someone who disagrees with me.

___ 08 I'm more likely to try to understand someone else''s opinion than to try to evaluate it.

___ 09 I try to think with people instead of against them.

___ 10 I feel that the best way for me to achieve my own identity is to interact with a variety of other people.

___ 11 One could call my way of analyzing things "putting them on trial, because of how careful I am to consider all of the evidence.

___ 12 I often find myself arguing with the authors of books I read, trying to logically figure out why they'are wrong.

___ 13 I have certain criteria I use in evaluating arguments.

___ 14 I always am interested in knowing why people say and believe the things they do.

___ 15 I enjoy hearing the opinions of people who come from backgrounds different from mine-it helps me understand how the same things can be seen in such different ways.

___ 16 I try to point out weaknesses in other people's thinking to help them clarify their arguments.

___ 17 The most important part of my education has been learning to understand people who are very different from me.

___ 18 I like to understand where other people are "coming from," what experiences have led them to feel the way they do.

___ 19 I value the use of logic and reason over the incorporation of my own concerns when solving problems.

___ 20 I'll look for something in a literary interpretation that isn't argued well enough.

APPENDIX E

INFORMED CONSENT

You are invited to participate in a study on communication style and dealing with people. Since ways of interacting and discussing issues may vary, true insight comes from obtaining many viewpoints. Your class was randomly selected as a source of possible participants in this study, since our goal is to understand the insights of students taking college classes. We are expecting to have about 60 participants in this study.

If you decide to participate you will be asked to complete two short surveys that will take about 10-15 minutes each to complete. You will be asked to take the surveys on two different days. The survey explores your thoughts on communication style and dealing with others. Your responses will remain anonymous and confidential. This information will help us understand college students' perspectives, which inform future college professors in their instruction.

No risks are anticipated in this study. All information will remain completely confidential and anonymous. All forms of ID will be removed from the data base.

Participation in this study is entirely voluntary. Your decision on whether or not to participate will not affect your future relations with Wichita State University. If you agree to participate in this study, you are free to withdraw from the study at any time without affecting your status as a student.

If you have any questions about this research, please ask us. If you have additional questions during the study, we will be glad to answer them. You can contact us, Margaret Phillips or Marlene Schommer-Aikins, at Wichita State University, Wichita, KS (316-978-3326). If you have questions pertaining to your rights as a research subject, or about research-related injury, you can contact the Office of Research Administration at Wichita State University, Wichita, KS 67260-0007, telephone 316-978-3285.

You will be offered a copy of this consent form to keep.

You are making a decision whether or not to participate. Your signature indicates that you have read the information provided above, and have voluntarily decided to participate.

_____ _____
Signature of Research Participant Date

_____ _____
Signature of Investigator (Marlene Schommer-Aikins) Date

_____ _____
Signature of Investigator (Margaret Phillips) Date

Contextual Priming of Participants

Take a moment and think about people LIKE yourself.

1. **Select** three (3) groups of people from the following list **OR generate** three (3) groups of your own that you relate to the most and write these groups below.

Debate Team	Competitive Athletes	Sorority/Fraternity	Book Club
Science Club	Parent Teacher Organization	Cooking Club	Musicians
Chess Club	Physical Fitness Club	School Affiliation	Speech Club
Sports Fans	Religious Affiliation	Gardening Clubs	Theatre Group
Ethnicity	Political Affiliation	Academic Major	Martial Arts

2. List your three groups here:

3. Then choose one of these groups and place an asterisk * by the group.

4. Then list five (5) things that make you LIKE members of this group.

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Basic Demographics and Background Survey

Please provide the following demographic information.

1. Name: _____
2. WSU ID Number: _____
3. What is your sex?

   ○ Male ○ Female
4. What is your age? _____
5. What is your ethnicity?

   ○ Caucasian or White ○ Asian

   ○ African American or Black ○ Hispanic or Latino

   ○ American Indian or Alaskan Native ○ Native Hawaiian or Pacific Islander
6. What is your academic major (e.g. Elementary Education, Math Education, Counseling, Educational Psychology)? _____
7. What is your highest level of education?

   ○ Freshman ○ Working on Masters ○ Other (specify)

   ○ Sophomore ○ Working on Specialist _____

   ○ Junior ○ Working on Doctorate

   ○ Senior ○ Doctorate Complete
8. Is English your primary language?

   ○ Yes ○ No

Thank you for completing the survey.

APPENDIX F

INFORMED CONSENT

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_____ _____
Signature of Research Participant Date

_____ _____
Signature of Investigator (Marlene Schommer-Aikins) Date

_____ _____
Signature of Investigator (Margaret Phillips) Date

Contextual Priming of Participants

Take a moment and think about people UNLIKE yourself.

1. **Select** three (3) groups of people from the following list **OR generate** three (3) groups of your own that you relate to the least and write these groups below.

Debate Team	Competitive Athletes	Sorority/Fraternity	Book Club
Science Club	Parent Teacher Organization	Cooking Club	Musicians
Chess Club	Physical Fitness Club	School Affiliations	Speech Club
Sports Fans	Religious Affiliation	Gardening Clubs	Theatre Group
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2. List your three groups here:

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4. Then list five (5) things that make you UNLIKE members of this group.

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3. What is your sex?

   ○ Male ○ Female
4. What is your age? _____
5. What is your ethnicity?

   ○ Caucasian or White ○ Asian

   ○ African American or Black ○ Hispanic or Latino

   ○ American Indian or Alaskan Native ○ Native Hawaiian or Pacific Islander
6. What is your academic major (e.g. Elementary Education, Math Education, Counseling, Educational Psychology)? _____
7. What is your highest level of education?

   ○ Freshman ○ Working on Masters ○ Other (specify)

   ○ Sophomore ○ Working on Specialist _____

   ○ Junior ○ Working on Doctorate

   ○ Senior ○ Doctorate Complete

8. Is English your primary language?

   ○ Yes ○ No

Thank you for completing the survey.

APPENDIX G

INSTRUCTOR SURVEY INSTRUCTIONS

Thank you for allowing us to survey your students for this project. We estimate the survey to take 10-15 minutes for completion. You will be provided two manila envelopes (Week 1 and Week 2) containing two different colors of survey packet forms.

Procedures for administrating the first Survey (Week 1 Packet) are as follows:

- There are two different colored surveys. Students whose birthdays fall between **January and June** will complete the **BLUE** colored survey forms. Students whose birthdays fall between **July and December** will complete the **GREEN** colored survey forms.

- **Students must complete the forms in the order they are stapled**: Consent Form, Contextual Priming of Participants, ATTLS Survey, and Demographic Survey. All forms must be completed each time. Students must fill in their student ID Number and name on the Demographic Survey so we can link` their responses the following week. This identification will be deleted from the database.

- The researcher will be present during the survey and will pick up the forms when completed. **Instructors: Please track all students who choose to NOT participate in the survey.**

This survey is to be administered the following week (Week 2 Packet) as follows:

- Students will select the different colored packets the second time. Students whose birthdays fall between **January and June** will complete the **GREEN** colored survey forms. Students whose birthdays fall between **July and December** will complete the **BLUE** colored survey forms.

- All specifications listed above must be repeated.

SURVEY SCRIPT INSTRUCTIONS FOR STUDENTS

- Advise students they have been invited to participate in a study on communication styles and dealing with people. Further advise the class they were selected to help understand the insights of students taking college classes.

- Advise students their participation is voluntary and the survey will be repeated again following a 1 week interval. Also advise students that all information is confidential and all participant information will be removed from the data base once the two surveys have been linked. Participants may contact the researcher for a general overview of the results.

- Advise students if you have elected to offer extra credit or other compensation for their participation in this survey.

Again, thank you for allowing me this time out of your busy class schedule. I look forward to sharing the results once they have been analyzed. Please call Margaret Phillips at 978.3326 or 393.7002 if you have any questions or suggestions.

APPENDIX H

Descriptive Statistics of Attls Items

ATTLS Items	Mean	SD	Range	Skewness
attls1	3.98	1.79	1-7	-.24
attls2	5.66	1.31	2-7	-.94
attls3	5.47	1.25	1-7	-1.2
attls4	5.47	1.07	3-7	-.27
attls5	5.56	1.03	2-7	-.62
attls6	5.28	1.28	2-7	-.43
attls7	4.28	1.63	1-7	-.38
attls8	4.72	1.25	2-7	-.28
attls9	5.13	1.25	2-7	.-.38
attls10	5.36	1.46	1-7	-.68
attls11	4.21	1.61	1-7	-.16
attls12	2.92	1.52	1-7	.58
attls13	4.07	1.51	1-7	-.26
attls14	5.60	1.14	3-7	-.70
attls15	5.95	1.04	2-7	-.75
attls16	3.62	1.63	1-7	.08
attls17	4.67	1.53	1-7	-.413
attls18	5.85	1.0	3-7	-.61
attls19	5.02	1.36	2-7	-.35
attls20	3.61	1.55	1-7	-.15

dattls1	3.90	1.79	1-7	-.26
dattls2	5.66	1.25	1-7	-1.1
dattls3	5.20	1.29	1-7	-.80
dattls4	5.38	1.16	1-7	-1.34
dattls5	5.38	1.32	1-7	-1.09
dattls6	5.31	1.42	1-7	-.79
dattls7	4.32	1.80	1-7	-.38
dattls8	4.65	1.36	1-7	-.46
dattls9	4.96	1.26	1-7	-.33
dattls10	5.20	1.48	1-7	-.65
dattls11	4.16	1.56	1-7	-.18
dattls12	3.06	1.58	1-7	-.46
dattls13	3.99	1.42	1-7	-.28
dattls14	5.44	1.28	1-7	-1.16
dattls15	5.82	1.22	1-7	-1.52
dattls16	3.68	1.65	1-7	.05
dattls17	4.63	1.47	1-7	-.60
dattls18	5.67	1.18	1-7	-1.60
dattls19	5.11	1.38	1-7	-.46
dattls20	3.63	1.63	1-7	-.01

Note: Attls refers to in-group responses; dttls refers to out-group responses