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Concept Mapping As A Buffer Against Evaluative Flexibility

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CONCEPT MAPPING AS A BUFFER AGAINST EVALUATIVE FLEXIBILITY

by

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DEDICATION

I would like to dedicate this project to all of the important teachers and mentors I have had before graduate school who recognized untapped potential in me and decided to help it grow (in a somewhat chronological order):

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CHAPTER 1

INTRODUCTION

The flexibility of attitudes and beliefs is both hindering and advantageous. Without flexible attitudes, movements that spurred great social change would have failed to correct societal inequalities that undermine human well-being by persuading individuals to alter their opinions. Yet, flexible attitudes have some vices. From Adolf Hitler to Jim Jones, the flexibility of their followers' attitudes and beliefs allowed one individual with extreme intentions to lead great numbers of people to commit atrocities that shook social scientists' understandings of human morality.

Social psychologists are has examined both the "dark" and "light" sides of attitude stability and change (Ajzen & Fishbein, 1977; Schwarz, 2007; Lord & Lepper, 1999). Though the flexibility of attitudes has paved the road to many of social psychology's greatest findings in social influence and persuasion, attitude flexibility has a few less than desirable implications. Historically, the utility of attitudes, or evaluations, has been rooted in the ability of attitudes to predict behavior (Cohen, 1964; DeFleur & Westie, 1963). Attitudes have also been conceptualized as stable dispositions (Ajzen, 1988, 1991; Campbell, 1950; 1963; Chein, 1948; Krech & Crutchfield, 1948). Unfortunately, attitudes have often been found to be less than useful as behavioral predictors (Campbell, 1963; Eagly & Chaiken, 1993; LaPiere, 1934; McGuire, 1985; Wicker, 1969; see Lord & Lepper, 1999 and Schwarz, 2007 for reviews), and often fail to be consistent across time (Asch, 1940) due to context effects (Schwarz, 2007) and social influence (Eagly & Chaiken, 1993; Festinger, 1950; for reviews see Crano & Prislin, 2006; Petty, Wegener, & Fabrigar,1997; Wood, 2000).

Many researchers have theorized that attitude flexibility is largely due to variations in the accessible attitude-relevant knowledge individuals use when forming an evaluation (Lord & Lepper, 1999; Schwarz, 2007), since attitude reports tend to be congruent when the information available is consistent at different time periods (Lord & Lepper, 1999; Lord, Paulson, Sia, Thomas, & Lepper, 2004; Schwarz & Bohner, 2001). According to this construal-based perspective, the key to getting individuals to have stable, behaviorally-predictive evaluations is to increase the likelihood that they will retrieve consistent representations of attitude-objects prior to evaluative responding (Lord & Lepper, 1999). In the present research, a method of making evaluations more consistent across time has been proposed. Having individuals draw concept maps to structure and deliberate their knowledge has been established as an effective way to aid in the storage and retrieval of information (e.g. Amer, 1994; Blankenship & Dansereau, 2000; Hall & O'Donnell, 1996; Lambiotte, Dansereau, Cross, & Reynolds, 1989; Nesbit & Adesope, 2005; 2006; Patterson, Dansereau, & Newbern, 1992), and therefore may aid in making accessible attitude-representations more consistent across time. The purpose of the proposed research is to demonstrate that having individuals deliberate their attitude-relevant knowledge via concept mapping will serve to buffer against evaluative flexibility, even in the face of an attitude change manipulation.

Stable and Unstable Evaluations

Though many social psychologists have conceptualized attitudes as enduring dispositions (e.g. Ajzen, 1988, 1991; Campbell, 1950; 1963; Chein, 1948; See Eagly & Chaiken, 1993 for a review; Krech & Crutchfield, 1948), a wealth of research suggests this is not so. Evaluative responses can be rendered inconsistent by many means, such

as continual exposure to a stimulus (Abrams & Greenwald, 2000; Bornstein, 1989; Harmon-Jones & Allen, 2001; Moreland & Zajonc, 1982), evaluative conditioning (See De Houwer, Thomas, & Baeyens, 2001 for a review; Levey & Martin, 1975), subliminal priming (e.g. Han, Olson, & Fazio, 2006), extrapersonal associations (Olson & Fazio, 2004), changing the accessible mental representations one has of an attitude object (Bless, Schwarz, & Wänke, 2003; Lord & Lepper, 1999; Lord, Paulson, Sia, Thomas, & Lepper, 2004; Schwarz & Bless, 2007; Sia, Lord, Blessum, Ratcliff, & Lepper, 1997; Schwarz, 1999; Tourangeau, 1992), knowing others have different attitudes (Asch, 1940; Ledgerwood, Trope, & Chaiken, 2010; McGuire, 1969), temporal construal (Ledgerwood, Trope, & Chaiken, 2010), and the context of nearby questions in self-report measures (e.g., Schwarz, 1999; Tourangeau, 1992), among others. If attitudes are so often discrepant, is it even useful to consider them as enduring states or dispositions? Many theorists argue that attitudes are spontaneously constructed whenever an attitude object is encountered (Bassili & Brown, 2005; Lord & Lepper, 1999; Schwarz, 2007; Schwarz & Bohner, 2001; Smith & DeCoster, 2000; Tourangeau, 1992; Wilson & Hodges, 1992; Zaller, 1992). To these theorists, attitudes are no longer conceptualized as enduring dispositions (Ajzen, 1988, 1991; Campbell, 1950; 1963; Chein, 1948; Krech & Crutchfield, 1948) or “files” that are retrieved from memory (Wilson & Hodges, 1992). In this case, when attitudes are considered to be “stable,” individuals are providing relatively consistent attitude constructions across time (Schwarz, 2007).

Attitude Relevant Knowledge

One reason individuals may report consistent attitudes is that accessible information relevant to the attitude object is also consistently activated across time (Lord & Lepper, 1999). These activated representations can explain a wide variety of the context effects that occur with evaluative responses since attitudes are an outcome of the evaluative processes that use a limited amount of information available in memory and one's environment (Lord & Lepper, 1999; Schwarz & Bohner, 2001; Wilson & Hodges, 1992). Accordingly, many theorists hold that attitudes are a function of the knowledge and mental representations one has of an attitude object (e.g. Ajzen & Sexton, 1999; Ajzen & Fishbein, 1977; Anderson, 1971; Bassili & Brown, 2005; Chaiken, Duckworth, & Darke, 1999; Conrey & Smith, 2007; Fazio, 1990, 1995, 2007; Fishbein & Ajzen, 1975; Ledgerwood, Trope, & Liberman, 2010; Lord & Lepper, 1999; Schwarz & Bohner, 2001; Wilson & Hodges, 1992). This information that is used in evaluative processing is often referred to as "attitude-relevant knowledge" (e.g. Barden & Petty, 2008; Clark, Wegener, & Fabrigar, 2008; Fabrigar, Petty, Smith, & Crites, 2006; Holbrook, Berent, Krosnick, Visser, & Boninger, 2005; Wood, Rhodes, & Biek, 1995). Although there is great consensus that attitude-relevant knowledge is involved in attitude construction, there is little consensus in exactly how attitude-relevant knowledge is conceptualized as coming together to render a judgment. Some models identify a single, unitary process in which information comes together to form a judgment (e.g. Anderson, 1971; Fazio, 1995; Fishbein & Ajzen, 1975; Lord & Lepper, 1999), while others offer more than one (e.g. Dual-process models such as those developed by Chaiken, 1980, 1987; Petty & Cacioppo, 1986).

Both the heuristic-systematic model (Chaiken, 1980, 1987; Chaiken, Liberman, & Eagly, 1989) and the elaboration-likelihood model (Petty & Cacioppo, 1986) are examples of dual-process models of attitude formation and change. Both models conceptualize attitude construction and change as a function of either highly effortful cognitive processing or cognitive processing that is not effortful. The Elaboration likelihood model maintains that central, or effortful, processing involves a careful scrutiny of attitude-relevant information, whereas peripheral (low effort) processing uses trivial information such as message-length, source expertise, and source-attractiveness, among others (Petty & Cacioppo, 1986). According to Petty and Cacioppo (1986), the motivation and ability to process persuasive attempts predicts what information processing route will be used to render a judgment. Similarly, the heuristic-systematic model distinguishes between thorough, analytic processing of information (systematic processing) and limited information processing utilizing simple decision-making rules or heuristic processing (Chaiken, Liberman, & Eagly, 1989).

Single-process models of attitude-relevant processing generally focus more on the structure and integration of attitude-relevant knowledge than the mode of attitude-relevant information processing. For instance, both the expectancy-value model (Fishbein & Ajzen, 1975) and Attitude Representation Theory (Lord & Lepper, 1999) posit that evaluations are an additive combination of the valence of attitude-relevant knowledge. Similarly, Information Integration Theory (Anderson, 1971, 1981) holds that pieces of salient attitude-relevant information are weighted by their perceived importance and combined to form a judgment.

Other models tie in systems of how evaluative information is stored and processed. Expanding upon Fazio's MODE model of attitudes (1990, 1995, 2007), which views the attitude as a link between an attitude-object and an evaluation, Wegener and Carlston (2005) describe attitude-relevant knowledge as existing in an associative network, with pieces of attitude-relevant information being other nodes that are linked to this connection. Bassili and Brown's (2005) Potentiated Recruitment Model maintains that evaluations are a function of microconcepts, or molecular units of attitude-relevant knowledge, that are activated from a representational network. Bassili and Brown identify several sources that activate attitude microconcepts: priming, eliciting conditions such as encountering attitude objects, spreading activation, and activity in working memory. Conrey & Smith's (2007) connectionist model of attitude representation and construction makes very similar claims to the Potentiated Recruitment Model, but differs in explaining how the construction of implicit evaluative responses occurs. Both models view explicit, self-reported attitudes as a function of the accessible representations in working memory. However, Bassili and Brown (2005) argue that implicit evaluations are not a function of accessible representations, whereas Conrey & Smith (2007) posit that individuals are conscious of their implicit evaluations, indicating working memory is important for implicit evaluations. Regardless of the method in which evaluative information is stored, retrieved, and used to render an evaluation, it is clear that attitude-relevant knowledge is one of the most important factors in determining attitudes and behavioral consistency (Lord & Lepper, 1999). Having established the importance of attitude-relevant knowledge, the following

sections will explore the role that attitude-relevant knowledge plays in both the behavioral-predictability and evaluative consistency of attitude reports.

Attitude-Relevant Knowledge and Attitude-Behavior Consistency

In addition to recognizing the extensive role of attitude-relevant knowledge in evaluative judgments, attitude theorists recognize that some attitudes have more "strength" than others. Strong attitudes persistent across time, are resistant to change, have a strong impact on behavior, and strongly impact information processing (Krosnick & Petty, 1995). Because strong attitudes affect information-processing, attitude stability and attitude-behavioral consistency should be associated with greater attitude-relevant thinking. Attitude strength has been assessed using several dimensions: certainty of one's attitudes, higher levels of perceived attitude-relevant knowledge, more accessible attitudes, perceiving the attitude object as important and personally-relevant, and more extreme attitude reports, among others (Krosnick, Boninger, Yao, Berent, & Carnot, 1993; Krosnick & Petty, 1995).

In the context of the potentiated recruitment framework (Bassili & Brown, 2005; Bassili, 2008) attitude strength is viewed as an increased fluidity of attitude-relevant knowledge potentiation. Attitudes that are stronger and subsequently more stable are theorized to be a function of groups of interconnected attitude-relevant microconcepts (Bassili, 2008). Because these microconcepts are interconnected, they are likely to be consistently activated together, leading to activated attitude representations that are relatively consistent across time. In turn, these consistent attitude representations lead to consistent evaluative responses, since they are more likely to be potentiated than other representations. Additionally, due to their fluidity, these attitude relevant

representations will be more accessible, meaning that the attitude-relevant knowledge is elicited more quickly, leading to quicker evaluative judgments. Most importantly, because these micro-concepts are likely to be recruited consistently, leading to consistent evaluations, it is more likely that these evaluations will affect behavior consistently, leading to greater correspondence between attitude reports and behaviors.

In addition to the literature on attitude strength and attitude-behavior consistency, one body of research has established that greater amounts of attitude-relevant thinking lead to increased attitude-behavioral consistency. Both Kallgren and Wood (1986) and Davidson, Yantis, Norwood, and Montano (1985) found that the amount of information participants listed about attitude objects was positively associated with how predictive participants' reported attitudes were of behaviors. Welker, McIntyre, Oberleitner, Lin, and Lord (2012) had participants create attitude concept-maps to increase the amount of attitude-relevant thinking participants engaged in. Participants that designed more elaborate concept maps about attitude objects reported attitudes that were more predictive of behavioral intentions (Study 1). When the researchers manipulated the complexity of the concept maps and whether the concept maps were about the attitude object (former substance abusers) or irrelevant topic (the common cold), participants that designed more complex, attitude-relevant concept maps showed greater attitude-behavior consistency (Study 2). By having participants deliberate their knowledge in concept maps, Welker and colleagues may have increased the likelihood the deliberated knowledge was retrieved during evaluative responses. The researchers concluded that when participants were indicating their attitude and later indicating their behavioral intentions, those with higher levels of attitude relevant deliberation were

more likely to rely on similar representational inputs, thus making attitudes and behavioral intentions more consistent with each other. If this is the case, attitude-relevant concept mapping may also make attitude reports more consistent across time and buffer attitude reports against the widely known context effects that make attitudes inconsistent.

In addition to the amount of deliberation, the source-complexity and behavioral relevance of attitude-relevant information has been found to increase attitude-behavior consistency. Fabrigar, Smith, Petty, & Crites (2006) found that exposing participants to behaviorally-relevant knowledge increased attitude-behavior consistency (Study 1), and that the number of knowledge sources improved the attitude-behavior consistency when the information was of low-behavioral relevance. In a study of attitude-relevant actions, Lin, McIntyre, Welker, and Lord (2011) found that participants that listed both actions they have taken toward substance abusers (study 1) and lesbians (study 2) and actions members of these social categories have taken toward them (two sources) showed greater attitude-behavior consistency than those that listed only their own actions, only actions the social category members have taken toward them, or no actions at all (one or zero sources). Although both the amount and source complexity of information that individuals deliberate is related to attitude-behavior consistency, it has yet to be shown empirically, however, that higher amounts of attitude-relevant deliberation lead to consistent attitude reports and buffer against sources of attitude change.

Attitude-Relevant Knowledge and Attitude Construction Stability

Multiple theories argue that attitudes are constructed by the accessible attitude-relevant knowledge and mental representations individuals have of attitude objects

(Ajzen & Sexton, 1999; Bassili & Brown, 2005; Conrey & Smith, 2007; Fazio, 1990, 1995, 2007; Ledgerwood, Trope, & Liberman, 2010; Lord & Lepper, 1999). According to Attitude Representation Theory (Lord & Lepper, 1999), evaluative responses are a function of the subjective assumptions and immediate perceptions of attitude objects. When these mental representations match across time, the evaluative responses they construct should match as well. Accordingly, Sia et al. (1997) found that when participants named the same social category exemplar at two different experimental sessions, their attitude reports toward the social category were more consistent across the two times (Experiment 1) and their attitudes more accurately predicted behaviors (Experiment 2). Thus, if the attitude representations an individual has are strengthened in memory, it will be more likely for those representations to be recalled during future evaluations. Because these similar representations are activated consistently across time, possibly due to accessibility, attitude reports should remain consistent, as well.

Similarly, Bassili and Brown's (2005) Potentiated Recruitment Model maintains that evaluations are a function of microconcepts activated from a representational network. Bassili and Brown identify several sources that activate attitude microconcepts: priming, eliciting conditions such as encountering attitude objects, spreading activation, and activity in working memory. Attitudes that are stronger and subsequently more stable are theorized to be a function of groups of highly interconnected attitude-relevant microconcepts (Bassili, 2008). Because these microconcepts are highly interconnected, they are very likely to be consistently activated together, leading to the activated attitude representations that are relatively consistent across time. In turn, these consistent attitude representations will lead to consistent evaluative responses. Conrey & Smith's

(2007) connectionist model of attitude representation and construction makes very similar claims to the Potentiated Recruitment Model, but differs in explaining how the construction of implicit evaluative responses occurs. Both models view explicit, self-reported attitudes as a function of the accessible representations in working memory. However, Bassili and Brown (2005) argue that implicit evaluations are not a function of accessible representations, where Conrey & Smith (2007) posit that individuals are conscious of their implicit evaluations, indicating working memory is important for implicit evaluations.

Attitude Change and Social Influence

According to constructionist view of attitudes, evaluations flexibly adapt to the current situation (Schwarz, 2007). Given the limited capacity of human working memory, and the vast amounts of attitude-relevant information that are often stored in long-term memory, only a small sample of attitude-relevant information is normally used to evaluate attitude objects. Because individuals can find themselves in a wide variety of unique situations with vastly different demands, they are required to make judgments based on widely different samples of evaluative information (Bassili & Brown, 2005; Conrey & Smith, 2007; Lord & Lepper, 1999). Even though this variability of evaluation can render evaluations inconsistent, less predictive of behavior, and can lead researchers to deem the attitude as less-than-useful construct (e.g. Wicker, 1969), the flexibility of evaluative responses is advantageous for dealing with the demands of the here-and-now. In particular, evaluative flexibility leads individuals to develop needed and desired social connections, along with adjust their representation of reality to one that is shared by others.

Many theorists have argued that humans a fundamental need to seek out and maintain affiliations with others (e.g. Baumeister & Leary, 1995; Bowlby, 1969; Horney, 1945; James, 1890; Leary, 2010; Maslow, 1968). This fundamental need to acquire affiliations and avoid rejection (Baumeister & Leary, 1995) has been argued to be evolutionary in nature (Ainsworth, 1989; Kameda & Tindale, 2006) and individuals strive to behave in specific ways that will be accepted by others (Baumeister & Leary, 1995; Leary & Baumeister, 2000). Researchers have found many ways in which individuals increase the likelihood of being accepted by others, such as self-disclosure (Miller, 2002), impression management (Baumeister, 1982; Leary & Kowalski, 1990; Schlenker, 1980; Jones & Pittman, 1982), and ingratiation (Jones, 1964), among many. To be accepted, individuals should also hold attitudes and beliefs that are consistent with those who they are to be accepted by (Ledgerwood & Liviatan, 2010). The relational strategy of changing one's attitudes or expression of their attitudes is particularly relevant for understanding how evaluations can change in response to social pressures and relationship opportunities.

Socially shared views have been established to be highly important for coordinating group behavior (Brennan & Clark, 1996; Festinger, 1950; Hardin & Higgins, 1996; Turner, 1991; Ledgerwood & Liviatan, 2010; McGuire, 1969). Shared reality theory (Echterhoff, Higgins, & Levine, 2009; Hardin & Conley, 2001; Hardin & Higgins, 1996; Jost, Ledgerwood, & Hardin, 2009) holds that people have both affiliative and epistemic motivations to develop a view of the world that is consistent with the views of others. Furthermore, according to shared reality theory (SRT), the perception of a belief's veracity is largely determined by whether others' are viewed as accepting that

belief as true. SRT explains a variety of findings revealing the socially-flexible nature of judgment, such as why individuals tend to shift their attitudes to be in line with those of close relationship partners (Davis & Rusbult, 2001), individuals shift their self-concepts and self-evaluations in congruence with those of strangers (Baldwin & Holmes, 1987; Hinkley & Anderson, 1996; Sinclair, Dunn, & Lowery, 2005; Sinclair, Lowery, Hardin, & Colangelo, 2005), group members' estimates of the apparent movement of a stationary point of light converge over time (Sherif, 1936). SRT also explains how the perceived social consensus of racial attitudes affects the distance individuals will sit from members of racial outgroups, depending on their own race bias (Sechrist & Stangor, 2001) and whether self-evaluations will be affected by the stereotypes of others (Sinclair, Huntsinger, Skorinko, & Hardin, 2005), among others. In summary, not only will individuals' evaluations be affected by shifts in their own accessible attitude relevant knowledge, their evaluations will be influenced by the evaluations of others and the demands of the current situation.

Concept Mapping

One technique that has been used extensively to get individuals to think deeply about their attitude relevant knowledge is concept mapping. Concept maps, at base, diagrams that are used to communicate, represent, and organize knowledge. Designing concept maps has been used to as a technique to get individuals to deliberate their knowledge and indicate how their knowledge on a given domain is structured (Crandall, Klein, & Hoffman, 2006), and a large body of research suggests that concept maps are especially effective at leading individuals to retain information (e.g. Amer, 1994; Blankenship & Dansereau, 2000; Hall & O'Donnell, 1996; Lambiotte, Dansereau, Cross,

& Reynolds, 1989; Nesbit & Adesope, 2005; 2006; Patterson, Dansereau, & Newbern, 1992; to name very few). In a meta-analysis of 55 concept-mapping studies, Nesbit and Adesope (2006) found that concept mapping is a more effective tool for retaining and transferring knowledge than reading text passages, attending lectures, participating in classroom discussions, and studying lists and outlines. Dansereau and Dees (2002) argue that concepts maps are particularly effective at increasing knowledge retention because expressing knowledge in sentences can muddle individuals' understanding of presented information with extraneous complexity. Although concept maps cluster related ideas, "language tends to 'string them out'" (Dansereau & Dees, 2002, p. 220). Accordingly, graphically presented information is recalled more often than information presented by language (Lambiotte, Dansereau, Cross, & Reynolds, 1989; Patterson, Dansereau, & Newbern, 1992).

The applications of concept mapping are numerous. Experts have been asked to express their knowledge of given domains in order to facilitate the learning of others, such as training new NASA engineers, educating students on the exploration of mars, and guiding diagnostic decisions in nuclear cardiology, to name a few (see Crandall, Klein, & Hoffman, 2006 for an extensive review). In many scientific journal articles, concept maps are also present to effectively communicate and summarize the theoretical and statistical relationships among variables (e.g. path diagrams in structural equation modeling). Concept mapping has also been established as a tool to lead individuals to use their knowledge to solve problems. For example, one line of research has found that concept mapping is a successful intervention for reducing substance abuse in substance abuse counseling (e.g. Blankenship, Dansereau, & Simpson, 1999;

Czuchry & Dansereau, 2003; Czuchry, Newbern-McFarland, & Dansereau, 2009; Dansereau & Dees, 2002; Dees & Dansereau, 1993).

Concept mapping was originally developed and refined as a means of understanding changes in students' scientific knowledge (Novak, 1977; 1998; Novak & Gowin, 1984). Novak based the concept mapping activity on the learning theories of David Ausubel (1963; 1968). Ausubel's learning theory is based on the premise that meaningful learning takes place by assimilating new concepts and prepositions with pre-existing concepts and prepositions. Thus, concept maps are in part very effective at retaining knowledge because they activate known concepts and illustrate their relationships with newly learned concepts (Hawk, 1986). In particular, link-node concept maps capture this prompting their creators to indicate concepts with nodes, where distinct ideas are enclosed in circles or squares, and use lines to connect the ideas/nodes. In many examples of concept mapping, individuals also specify how the nodes are specifically linked using words and arrows (e.g. [clouds] → create→[rain]).

Though concept maps have been used to evaluate individuals' knowledge, concepts maps can also be used to examine how attitude-relevant knowledge affects attitudes. Research using attitude concept mapping (Welker et al., 2012) has already demonstrated that creating effective concept maps of attitude-relevant knowledge leads to attitude reports that are more predictive of behavioral intentions. One possibility that may explain the increased attitude-behavior consistency that attitude-relevant concept mapping creates is that attitude-relevant concept mapping increases the consistency in evaluations across time. When individuals deliberate their knowledge via concept mapping, it increases their retention of the deliberated knowledge, thereby improving

their ability to apply the knowledge in future situations (Cañas, Quesada, Antoli, & Fajardo, 2003; Mintzes, Wandersee, and Novak, 2000; Novak, 1990; 1991; 1998). Therefore, when individuals experience a situation that elicits an evaluation, the knowledge that they deliberated by concept mapping is more likely to come to mind, leading to consistent evaluations across time.

Rationale

Concept maps can effectively aid the deliberation of knowledge, constructing evaluations, and taking action. Having individuals deliberate their attitude relevant knowledge by building concept maps of the knowledge relevant to an attitude object should strengthen the association between their knowledge and the attitude object. Thus, when individuals render their evaluations at different times, their evaluations will be more consistent if the individuals had created concept maps about the attitude object. Furthermore, their evaluations will be less prone to context effects. In the present research, it was hypothesized that individuals that deliberate their attitude relevant knowledge will report more consistent attitudes across time, even when they are at risk of being influenced by other individuals' reported attitudes. Additionally, because attitude strength is related to evaluative consistency, it is important to investigate whether attitude strength is both a predictor and a mediator of the effects of attitude-relevant deliberation on attitude consistency.

CHAPTER 2

Methods

Participants and design

One-hundred and seventy-two university psychology students were randomly assigned to a 3 (partner attitude valence: positive, negative, unknown/control) X 2 (concept map attitude relevance vs. irrelevance) design, with no more than 3 participants per experimental session. All participants were compensated by receiving partial course credit. Of the 172 participants, six participants were removed from the analyses due to substantial amounts of missing data in the online pretest, while another participant was eliminated for repetitively responding on the online pretest, leaving 165 participants (45 males, 120 females) included in the analyses. Of the participants, an open ended religion question revealed that 47.7% of participants identified as Christian, 22.1% percent identified as Atheist/Agnostic/Nonreligious, 16.9% identified as Muslim, 3.5% identified as either being Hindu, Buddhist, Jewish, or Sikh, and another 9.9% did not indicate any religion.

Materials and Procedure

Online attitude and personality pretest. Prior to the onsite experiment, participants completed an online pretest, indicating their attitudes toward physician-assisted suicide (PAS) and two filler social issues (same-sex marriage and gun control) on a 19-point likert-type scale (-9 = very negative, 0 = neutral, +9 = very positive). Participants also rated their attitude strength using attitude strength measures similar to measures used by other researchers (e.g., Brannon, Tagler, and Eagly, 2006; Krosnick, Boninger, Chuang, Berent, & Carnot, 1993; Pomerantz, Chaiken, & Tordesillas,

1995), indicating how strong their attitude toward PAS is, how certain they are of their attitude, how confident they are of their attitude, how often they've thought of PAS, how likely their attitudes are to change, and how personally relevant PAS is to them on 9 - point likert scales (see appendix A). Participants will also rate the two filler topics on these same strength dimensions.[1]

Laboratory experiment. Following the pretest, participants arrived in the laboratory to complete what they were informed was a study of how individuals discuss their opinions on social issues. Participants were informed by the researcher that after completing background questionnaires, the participants would be randomly paired with other participants in another location in the laboratory building to have a discussion about a selected social policy, a form of anticipated-interaction paradigm (e.g. Chen, Schechter, & Chaiken, 1996; Ledgerwood, Trope, & Chaiken, 2010). To minimize reactance and ensure participants were not aware of the discussion topic until they reported their attitudes, participants were informed that the other laboratory location would be selecting the social policy for the discussion topic.

Concept mapping. The experimenter instructed the participants to design a concept map using the cover story that concept mapping was a technique that was effective for promoting critical thinking, which was stated to be helpful when engaging in in-depth discussions. Participants were informed how to draw a concept map using an example concept map about the topic "dogs." The researcher than gave the participants 8 minutes to design a concept map either on PAS (the one which they are later instructed they will be discussing with their partner) or toward cell phone use while driving (not to be discussed with the partner; see Appendix B for an example of a

concept map toward the social group, gay men). The topic of cell phone use while driving was selected because it was found to have similar attitude and attitude strength dimension mean ratings to PAS (Britt, Millard, Sundareswaran, & Moore, 2009), and was believed to be unrelated to PAS. While participants created concept maps eight minutes, the researcher left and appeared to go to the other laboratory in the building to check on the other fictitious participants, acquire paperwork, and find out the discussion topic.

Partner attitude manipulation. After the eight minutes of concept mapping , the experimenter returned with several papers that appeared to be from the other lab. The manipulation of perceived partner attitudes was similar to that of Ledgerwood, Trope, and Chaiken (2010). The participants were told that they would be filling out background information about themselves to share with their partner, and that the participant(s) in the other lab had completed these same forms. These questionnaires contained several questions assessing personal characteristics and demographic information (gender, age, year, major, hometown, hobbies, and optional comments). Each participant received a blank background sheet and another that appeared to have been completed by their fictitious partner (See Appendix C). Participants were seated in cubicles to ensure that no participants observed any forms completed by other participants. Every participant was paired with what the background sheet described as a 21-year old 3rd year psychology major whose hobbies included “hanging out with friends, music, sports, reading, and watching television,” but the content of the optional comments entry varied, depending on the partner attitude valence condition. In the comments section, the fake discussion partner appeared to have either written “I think that physician assisted

suicide is a very important issue. I'm actually very much in support of/against physician assisted suicide," or, in the unknown attitude condition, no information appeared in the comments section. Once participants finished with the background sheet, the researcher gave participants a "pre-interaction questionnaire" with several additional measures and left to appear to take the background sheets to the other lab.

Attitudes and attitude strength. In the pre-interaction question, participants rated their attitudes and attitude strength toward PAS using the same measures they completed on the pretest (See Appendix D).[2]

After completing the dependent measures, participants were probed for suspicion using a funnel technique, asked to recall their assigned partners' attitude, and were asked if they felt their attitudes and thoughts toward PAS had changed between the online pretest and the experimental session. Of the 57 included participants in the negative partner attitude condition and the 52 participants in the positive partner attitude condition, all participants in these conditions correctly recalled their assigned partners' attitudes. Finally, participants were debriefed and thanked for their time. Although five of the participants suspected the study either involved social influence or attitude consistency, none were able to correctly indicate the hypotheses or identify why concept mapping was included in the experimental procedure. Although two participants indicated that they felt their opinions on PAS changed across the study, removing these participants from the analyses did not alter the significance of the subsequent reported results.

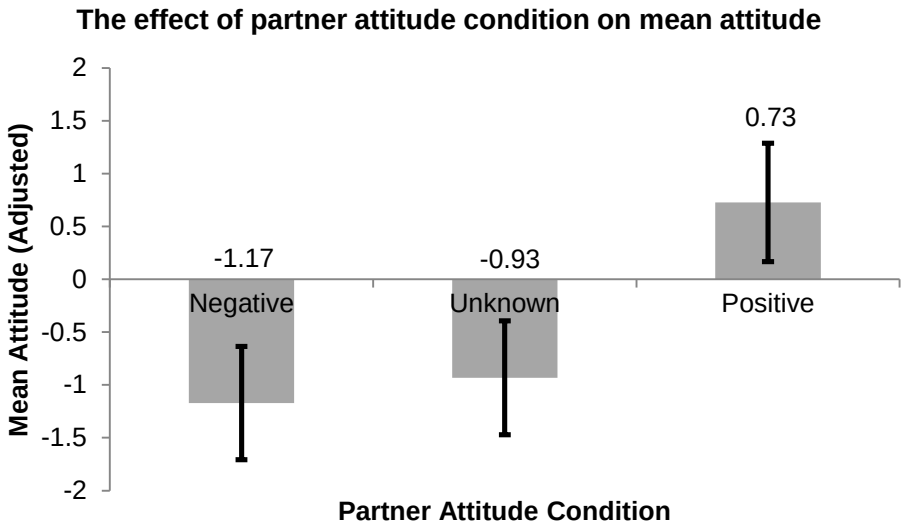
CHAPTER 3

RESULTS

Effects of Conditions on Attitudes and Attitude Strength

To assess whether the experimental conditions affected participants' attitude reports during the experimental sessions, time 2 PAS attitude reports were subjected to a 3 (partner attitude: positive, neutral, negative) X 2 (map topic: PAS, cell phone use while driving) ANOVA. This analysis yielded no significant main effect of map topic, $F(1,159) = .13$, $p = .716$, or partner attitude, $F(2,159) = 1.52$, $p = .221$, or a map topic X partner attitude interaction, $F(2,159) = .05$, $p = .952$, indicating that partner attitude condition and the assigned map topic did not affect time 2 attitudes. However, when a similar partner attitude X map topic ANCOVA was conducted on time 2 attitudes using time 1 (pre-test) attitudes as a covariate, this covariate strongly predicted time 2 attitudes, $F(1,158) = 160.18$, $p < .001$. Controlling for time 1 attitudes, a significant main effect of partner attitude was found, $F(2,158) = 3.50$, $p = .032$, but again, there was no significant main effect of map topic, $F(2,158) = .77$, $p = .383$, or map topic X partner attitude interaction, $F(2, 185) = .30$, $p = .744$. The main effect of partner attitude was probed with post-hoc comparisons (Fisher's LSD, see Figure 1), which revealed that although attitudes in the positive partner attitude were significantly greater than attitudes in the unknown ($p = .034$) and negative conditions ($p = .018$), attitudes in the negative and unknown partner attitude conditions did not significantly differ ($p = .804$). Thus, when controlling for time 1 attitudes, only the positive attitude manipulation were effective at changing participants' attitudes.

Figure 1.



Adjusted means for experimental session (time 2) attitudes toward physician-assisted suicide with error bars representing 95% confidence intervals for adjusted means. Numbers above bars represent adjusted means.

Principal components and reliability analyses were conducted six online pretest and the six experimental session items assessing attitude strength toward PAS. The strength items in the pretest (Cronbach's α = .72) loaded on one factor that explained 44.44% of the variance, with absolute loadings ranging from .25 (personal relevance) to .91 (certainty and confidence). A second factor explained an additional 24.12% of the variance, with large loadings on only three items. For the experimental session strength items (Cronbach's α = .78), two factors emerged, the first explaining 57.52% of the variance (all absolute loadings > .44), and the second explaining 18.47% of the variance (3 items with absolute loadings > .26). The factor structure and variance explained of the attitude strength components and items are presented in Table 1. Although the experimental session strength measures had more admissible reliability and factor structure than the online pretest, because the first factor in both forms had adequate loadings and explained a substantial amount of the variance and both forms had

adequate reliability, the items were averaged for each form to create two overall measures of attitude strength for time 1 and time 2.

Table 1.

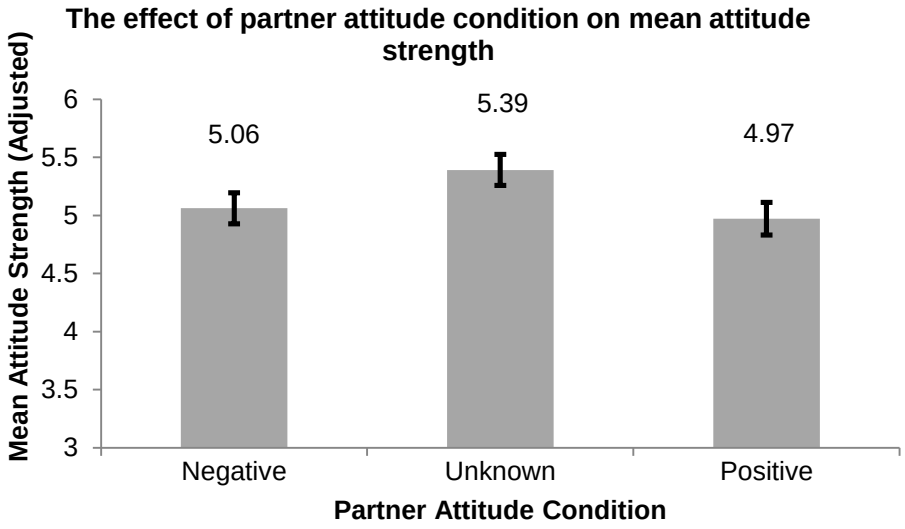
Principal Components Analyses of Attitude Strength Measures

	Online Pretest		Experimental Session	
Factor	1	2	1	2
% Variance Explained	44.44%	24.12%	57.52%	18.47%
	Factor Loadings (Unrotated)			
	Online Pretest		Experimental Session	
Perceived strength	0.68	0.08	0.83	-0.14
Certainty	0.91	-0.14	0.91	-0.23
Confidence	0.91	-0.15	0.89	-0.17
Thought Often	0.42	0.71	0.60	0.58
Likelihood to Change (rev)	-0.57	0.50	-0.77	0.26
Personal Relevance	0.25	0.80	0.44	0.77

Similar to time 2 attitude reports in the previous analyses, a 3 (partner attitude: positive, neutral, negative) X 2 (map topic: PAS, cell phone use while driving) ANOVA was conducted on the time 2 attitude strength measures, revealing marginally significant main effects of partner attitude and map topic, $F(2,159) = 2.76$, $p = .066$ and $F(1,159) = 2.89$, $p = .091$, respectively, and no significant interaction, $F(2,159) = 1.56$, $p = .213$. When time 1 attitude strength was added as a covariate (which strongly predicted time 2 strength, $F(1,158) = 161.03$, $p < .001$), the main effect of partner attitude remained marginally significant, $F(2,158) = 2.73$, $p = .068$, but the main effect of map topic and the interaction were not significant, $F(1,158) = 1.38$, $p = .242$ and $F(1,159) = 2.89$, $p = .091$, respectively. To explain the marginal main effect of attitude strength, post hoc comparisons (Fisher's LSD, see Figure 2) of attitude strength

adjusted means across the three partner attitude conditions showed that attitude strength significantly differed between the positive partner attitude and unknown partner attitude conditions (p = .030), marginally differed between the negative and unknown partner attitude conditions (p = .078), and did not differ between the negative and positive partner attitude conditions (p = .649).

Figure 2.



Adjusted means for experimental session (time 2) strength of PAS attitudes with error bars representing 95% confidence intervals for adjusted means. Numbers above bars represent adjusted means. The scale ranged from 1 to 9.

Attitude Consistency, Partner Attitudes, and Map Topic

The primary hypothesis of the current research was that attitude-relevant concept mapping would increase attitude behavior consistency. To test this prediction, hierarchical regression analysis was used with time 2 attitudes (A_2) regressed on time 1 attitudes (A_1; standardized), map topic (M; dummy coded: 0 = irrelevant, 1 = relevant), negative partner attitude (P_N; dummy coded: 1 = negative, 0 = otherwise), positive partner attitude (P_p; dummy coded: 1 = positive, 0 = otherwise), and all possible 2-way

and 3-way interaction cross-products. For the partner attitude dummy variables, the unknown attitude condition served as the reference group. In the first step of the regression analyses, main effects were entered, followed by 2-way interactions in step 2, and three way interactions in step 3. The final step of the analyses is represented by the following regression equation:

$$A_2 = \beta_0 + \beta_1(A_1) + \beta_2(M) + \beta_3(P_N) + \beta_4(P_p) + \beta_5(A_1)(M) + \beta_6(A_1)(P_N) + \beta_7(A_1)(P_p) + \beta_8(M)(P_N) + \beta_9(M)(P_p) + \beta_{10}(A_1)(M)(P_N) + \beta_{11}(A_1)(M)(P_p) + e$$

These analyses yielded no significant two-way or three-way interactions (see Table 2). Thus, results from only the first step of the analyses are interpreted and simple slopes analyses were not conducted. Attitudes from the online pretest predicted attitudes reported during the experimental session very well, β = .70, $t(160) = 12.52$, $p < .001$. In line with previous analyses, there was also a marginal effect of positive partner attitude, β = .13, $t(160) = 1.96$, $p = .052$, but no significant effect of negative partner attitude, β = -.01, $t(160) = -.017$, $p = .863$. Map topic also did not have an effect on time 2 attitudes, β = -.04, $t(160) = -.65$, $p = .519$. Although the concept map topic was not found to moderate the relationship between social influence and attitude change, it is worth noting the intercorrelations between attitudes and attitude strength across conditions (see Table 2). Altogether, attitudes were very consistent across time, which is indicated both in previous analyses with strong prediction of time 2 attitudes by time attitudes and correlations among attitude reports in all conditions with $rs \geq .495$, all ps < .05. Interestingly, the highest correlation between attitudes existed for participants in the unknown partner attitude-irrelevant concept mapping conditions ($r = .901$, $p < .001$).[3]

Religious Beliefs

Given that attitudes toward PAS are predicted by religiosity (Burdette, Hill, & Moulton, 2005; McCormack, Clifford, & Conroy, 2012), one topic that could substantially influence participant attitudes toward PAS are religious beliefs. A one-way ANOVA was conducted on the 3 largest categories of participants' religions (Christian, Muslim, and Atheist/Agnostic/Nonreligious; other categories were excluded from the analyses) on time 2 PAS attitudes, revealing significant differences in attitudes toward PAS among religious beliefs, $F(2,140) = 11.13$, $p < .001$. Post-hoc comparisons (Fisher's LSD) indicated that nonreligious participants had significantly more positive attitudes toward PAS ($M = 2.42$, $SD = .94$) than Christians ($M = -.95$, $SD = .60$), $p = .003$, or Muslims ($M = -4.07$, $SD = 1.01$) that were more negative than Christians ($p = .009$) and nonreligious participants ($p < .001$). Participants' religion was used as a predictor in a fourth step of the above hierarchical regression analyses predicting time 2 PAS attitudes by time 1 attitudes, map topic, partner attitude, and all cross-products (contrast coded -1 = nonreligious, 0 = Christian, 1 = Muslim). The primary purpose of these analyses were to investigate if concept map relevance moderated attitude consistency when controlling for religion, which would be indicated if any interaction terms from the previous analyses were significant. Although contrast-coded religion was a marginally significant predictor of time 2 PAS attitudes, $\beta = -.12$, $t(131) = -1.78$, $p = .078$, adding this variable to the analysis did not change the significance of any interactions, all ps > .486. Alternatively, Using a 2 variable dummy code system with Christians as the comparison group (Muslim dummy: Muslim = 1, other = 0; Nonreligious dummy: nonreligious = 1, other = 0) revealed that the Muslim dummy variable was a marginally significant covariate, β = -

.12, $t(130) = -1.91$, $p = .058$, but the nonreligious dummy variable was not, $\beta = .02$, $t(130) = .32$, $p = .740$. Adding these variables as covariates did not result in any significant interactions, all ps > .481. Altogether, accounting for the religion of participants did not change any of the nonsignificant relationships from the prior analyses.[4]

Table 2.
Summary of hierarchical regression analysis for variables predicting time 2 attitudes

Model	Predictor	β	t	p
Step 1	M	-0.04	-0.65	.519
R^2 = .505	P_p	0.13	1.96	.052†
Δ R^2 = .505	P_n	-0.01	-0.17	.863
F(4,160) = 40.73***	A_1	0.70	12.52	< .001***
Step 2	M	-0.05	-0.49	.624
R^2 = .511	P_p	0.10	1.10	.274
Δ R^2 = .505	P_n	0.00	-0.06	.952
F(9,155) = 18.01***	A_1	0.81	7.32	< .001***
	A_1 X M	-0.02	-0.22	.829
	A_1 X P_n	-0.10	1.22	.226
	A_1 X P_p	-0.08	-1.09	.278
	P_n X M	-0.01	-0.12	.909
	P_p X M	0.04	0.39	.698
Step 3	M	-0.05	-0.49	.624
R^2 = .520	P_p	0.10	1.10	.272
Δ R^2 = .505	P_n	0.00	-0.03	.976
F(11,153) = 15.06***	A_1	0.81	6.01	< .001***
	A_1 X M	-0.02	-0.12	.903
	A_1 X P_n	-0.04	-0.32	.750
	A_1 X P_p	-0.15	-1.37	.171
	P_n X M	-0.01	-0.14	.892
	P_p X M	0.04	0.39	.697
	A_1 X M X P_n	-0.09	-0.83	.411
	A_1 X M X P_p	0.09	0.85	.396

Note. Results reported are the standardized betas. M = Map Topic (0 = irrelevant, 1 = relevant); P_p = Positive Partner Attitude (1 = positive, 0 = otherwise); P_n = Negative Partner Attitude (1 = negative, 0 = otherwise); A_1 = Time 1 Attitude Report.
***p < .001 **p < .01 *p < .05 †p < .10

Table 3.
Summary of Intercorrelations, Means, and Standard Deviations for Attitudes and Strength at Time 1 and Time 2

Negative Partner Attitude						
Measure	1	2	3	4	M	SD
1. ATT1	-	-.380	.495*	-.527**	-0.81	3.03
2. STR1	.080	-	-.438*	.557**	5.66	1.52
3. ATT2	.712**		-	-.461*	-1.38	5.91
4. STR2	.043	.712**	.036	-	5.13	1.16
M	-1.35	5.62	-0.87	5.27		N = 26
SD	3.06	1.64	5.94	1.43	N = 31	
Unknown Partner Attitude						
Measure	1	2	3	4	M	SD
1. ATT1	-	.276	.787**	.286	-1.25	3.51
2. STR1	.046	-	.043	.711**	5.57	1.83
3. ATT2	.901**	-.087	-	.179	-1.14	5.82
4. STR2	.125	.774*	-.026	-	5.64	1.57
M	-0.89	5.32	-0.61	5.19		N = 28
SD	3.29	1.46	5.23	1.39	N = 28	
Positive Partner Attitude						
Measure	1	2	3	4	M	SD
1. ATT1	-	.198	.718**	-.149	-1.00	3.44
2. STR1	.012	-	.057	.777*	5.44	1.65
3. ATT2	.611**	.042	-	-.159	0.69	6.10
4. STR2	.144	.743**	.035	-	6.10	1.64
M	-1.35	4.75	0.62	4.38		N = 26
SD	2.67	1.99	5.17	1.23	N = 26	

Note: Means and standard deviations for the irrelevant mapping conditions appear in the lower left and in the upper right for the relevant mapping condition. ATT1 = Time 1 Attitude Report, ATT2 = Time 2 Attitude Report, STR1 = Time 1 Attitude Strength, STR2 = Time 2 Attitude Strength

CHAPTER 4

GENERAL DISCUSSION

In the present research, participants were led to believe they would interact with an individual that were either informed had a negative, positive, or an unknown attitude toward PAS. The present research investigated the extent to which concept mapping about the topic of PAS or an unrelated topic (cell-phone use while driving) would moderate attitude consistency and the influence of attitudes upon attitude consistency. In particular, this study was well designed in that it implemented a two-part approach to studying attitude consistency, which could assess changes in attitude strength and attitude valence across time. Although previous research has examined how concept mapping affects attitude-behavioral intention consistency (Welker et al., 2012), this study was the first to examine how concept mapping affects attitude consistency with a two-part design.

Although all participants believed they would meet with another participant (albeit with some minor suspicions) and were effortful in constructing their maps, the social influence manipulation was only successful in changing attitudes when participants were exposed to partners that held positive attitudes, only when controlling for time 1 attitudes, whereas the partner with negative attitude manipulation did not successfully affect attitude valence in comparison to the unknown attitude control groups. However, exposing participants to others' attitudes, whether positive or negative, reduced attitude strength. Moreover, although the social influence manipulation was not entirely successful at changing attitude valence, it did affect attitude strength. Contrary to hypotheses, the concept map relevance did not moderate the effects of partner attitude

influence on attitude valence consistency. Although the attitude consistency of the irrelevant-neutral group was not significantly different from other experimental groups, this group yielded the highest attitude consistency, when it was hypothesized this group would have the lowest attitude consistency.

Limitations

The high attitude consistency in PAS attitudes, which was not found to be moderated by concept mapping or social influence, may be explained by the attitude object that was chosen. Physician assisted suicide, despite being a topic that individuals have, on average, moderate levels of attitude strength and valence toward (Britt et a., 2009), may be a topic that individuals are unlikely to change perspectives on, particularly due to religiosity (Meier, Emmons, Wallenstein, Quill, Morrison, & Cassel, 1998). Even though this study did not assess religiosity per se, controlling for participants' religion did alter any of the observed relationships between attitudes, concept mapping, and social influence. Although the religion of participants was used as a predictor, if measures relevant to religiosity and attitudes were included in the study and controlled for, such as religiosity, right wing authoritarianism (Altemeyer, 1988), or dogmatism (Rokeach, 1960), moderation effects of concept mapping and social influence may have occurred on attitude consistency. Right wing authoritarianism and religious dogmatism are both associated with religious fundamentalism (Altemeyer & Hunsberger, 2004). In turn, conservative Christians are more likely to hold negative attitudes toward PAS in comparison to other religious groups (Burdette et al, 2005).

It is also possible, that the main attitude topic, PAS, may have increased participants thinking about death and or dying. The map topic of PAS, in comparison to

cell phone use while driving, may also have primed some individuals to think of death. Research from the perspective of terror management theory (Greenberg, Pyszczynski, & Solomon, 1986; Greenberg, Solomon, & Arndt, 2008; Pyszczynski, Greenberg, Koole, & Solomon, 2010) has examined the extent to which death-related thoughts impact a wide range of human behaviors, including attitudes toward outgroups (Greenberg et al., 1990), self-esteem (Schmeichel, Gailliot, Filardo, McGregor, Gitter, & Baumeister, 2009), defense of personal worldviews (Solomon, Greenberg, & Pyszczynski, 2004), to name very few. Research on social attitudes and norm adherence in the face of the awareness of death has shown mortality salience leads individuals to recommend more negative punishments for individuals that violate social norms (Rosenblatt, Greenberg, Solomon, Pysczynski, & Lyon, 1989, studies 1, 2, and 6) and greater rewards for heroes that uphold cultural values (Rosenblatt, Greenberg, Solomon, Pysczynski, & Lyon, 1989, study 3), for example. Additionally, Greenberg and colleagues (1990) also found that mortality salience leads individuals to evaluate religious ingroup members more positively than outgroup members (study 1), and in high-authoritarianism individuals, negative attitudes toward individuals with different attitudes (study 2), along with positive reactions to individuals that praise ones' cultural worldview (study 3).Mortality salience also leads individuals to avoid potentially damaging a cultural icon to solve a problem (Greenberg, Porteus, Simon, Pyszczynski, & Solomon, 1995). Given that negative attitudes toward PAS have been linked to conservative political beliefs and religiosity (Burdette et al, 2005; McCormack et al, 2012), both characteristics of traditional world views, and that thinking about PAS is likely to result in mortality salience, investigating mortality salience in the context of PAS attitudes is essential. Because mortality

salience influences individuals to cherish their personal worldview and eschew ideas that violate their conventions, individuals may be less likely to be influenced by the attitudes of others toward PAS. Because of this individuals may have found partners that disclosed attitudes toward PAS that differed from their own to be less persuasive.

Although Terror Management Theory may be an explanation for why the social influence manipulations did not work well in this study, TMT does not fully explain the results, nor was TMT systematically tested. In the present research, individuals that created irrelevant concept maps without being exposed to social influence had the greatest attitude behavior consistency of all conditions. Since participants in the relevant concept conditions deliberated about PAS more than the irrelevant concept map participants, it would still be expected that participants in the relevant mapping conditions would have the greatest attitude consistency. Although mortality salience may have affected the susceptibility to attitude change and deliberation in some, participants in the irrelevant concept mapping conditions showed the highest attitude consistency in the present research, indicating that other factors may be at work against this mortality salience hypothesis.

Previous research using social groups as attitude objects has found that concept mapping is effective in improving evaluative consistency (Welker et al., 2012). This research, along with the current research, was derived from the contention that concept maps are effective for knowledge deliberation because they enable individuals to integrate many concepts within their existing knowledge (Novak, 1977; 1998; Novak & Gowin, 1984), a process fundamental to meaningful learning (Ausubel, 1963; 1968). However, this process of integration may be more difficult for certain attitude objects.

For instance, the use of social groups (e.g. homeless people) for attitude concept mapping because individuals may find it easy to link up a wide range of representations of homeless individuals, such as characteristics, actions, exemplars, experiences, or situations. However, many college students may have had little experience or exposure to the topic of PAS, leading them to find it more difficult to integrate with their knowledge. This may have lead the concept mapping activities to be less effective at getting individuals to effectively deliberate their attitude-relevant knowledge and have it impact the consistency of their explicit attitude reports.

Another limitation of the current study involves a limited time-frame in which to observe changes in attitudes. Researchers of concept mapping have described concept mapping as a way of inducing new, long lasting changes in conceptualizations (Novak, 2002). Although it was hypothesized that concept mapping would lead to stronger attitude consistency, this was not supported by the results of this study. However, this lack of results does not necessarily imply that concept mapping leads individuals to be more consistent. Although nonsignificant, with the exception of the positive attitude influence conditions, individuals in the relevant mapping conditions actually had lower attitude consistency correlations than those in the irrelevant concept mapping conditions. The attitude consistency concept mapping creates may actually be a more delayed process, where concept mapping alters how an individual thinks about a topic, but in turn makes their attitudes more consistent across time. This interpretation is consistent with research on concept mapping, which shows that concept maps can lead individuals to new insights on the content they map about (e.g. Blankenship & Dansereau, 2000; Dansereau & Dees, 2002; Novak, 1990, 1998; Novak & Gowin,

1984). In particular, concept mapping may lead to attitude consistency, but only after individuals have created concept maps.

Future directions for research

Future research on concept mapping and attitudes would benefit to investigate longer term effects of concept mapping on attitudes. Ideally, a longitudinal study could assess attitudes at different points in time, with a concept mapping treatment at the beginning of the second part of the study. With this type of design, the extent to which concept maps induce attitude consistency or change can be measured before and after concept mapping, along with attitude consistency effects in post-intervention measures.

Taking into account the limitations identified within the current research, it will also be important to assess all potential variables that could influence participants' attitudes or reactions to persuasion with respect to the attitude object. In the current research, authoritarianism, religious variables, and death-thought accessibility could foreseeably affect attitudes and attitude consistency toward PAS. Future research on PAS attitudes would benefit from the inclusion of these variables. Similarly, for other specific attitude objects, other important variables may be necessary to take into consideration. For instance, if researchers investigating attitude concept mapping toward the topic of environmentalism, it may be important to take into account variables such as participants' knowledge of environmental science, the extent to which participants view global warming as a threat, and whether participants believe human beings are responsible for global warming. Additionally, because the extent to which participants' existing knowledge can be integrated within their concept maps will vary as a function of the map topic, researchers would also do well to select concept map topics

that participants have extensive knowledge about or have a large amount of knowledge that can be connected to the topic.

Conclusion

Although the current research did not find that concept mapping affected attitude consistency, several limitations may have altered these effects. Despite this lack of findings, investigating the relationships between attitude strength and attitude consistency with the extent to which individuals think about attitude objects is an important venture within social psychology. Although numerous studies have already investigated attitude relevant thinking and the properties of attitudes, none have focused as much on the extent to which individuals deliberate knowledge and how well they integrate the attitude object with their personal knowledge. Using concept mapping to study attitudes allows for both of these characteristics of knowledge to be assessed.

FOOTNOTES

[1]The effectiveness the manipulations in experimental laboratory session on attitudes might vary, depending on individual differences. To account for these possibilities, participants completed several personality and individual difference measures. These measures included the Need for Cognition Scale (Cacioppo & Petty, 1982), Need for closure scale (Webster & Kruglanski, 1994), Self-Monitoring scale (Snyder, 1974), and the Big-5 ten-item personality inventory (Gosling, Rentfrow, & Swann, 2003). See Appendix A for the attitude, attitude strength, and personality scales.

[2]Because the effectiveness of the concept mapping activity or partner attitude manipulation could have influenced or have been influenced by several additional factors, participants completed several additional measures (See Appendix D), including a mood item ("In general, how do you feel right now?"), an item assessing their interest in PAS ("How interesting do you think the issue of physician-assisted suicide is?"), affiliation motivation (DeWall, Visser, Leviatan, 2006), and several items examining the interaction they expect to have with their partner.

[3]The number of nodes all participants listed on their concept maps were also measured. A 2 (Map topic: PAS, cell phone use) X 3 (Partner attitude: positive, unknown, negative) ANOVA revealed a main effect of map topic, $F(1, 159) = 4.14$, $p = .043$. Participants that created maps about cell phone use listed more map nodes ($M = 21.66$, $SD = 7.69$) than those that created maps about PAS ($M = 19.33$, $SD = 7.07$), which is likely due to the fact that college students have more knowledge of the topic of using cell phones while driving than physician assisted suicide, and can thus create

more extensive concept maps about the topic. There was no significant main effect of partner attitude, $F(2,159) = .13$, $p = .879$, or partner attitude X topic interaction, $F(2,159) = 1.06$, $p = .349$. Correlation analyses were used to assess if nodes were related to time 1 and time 2 attitudes, attitude strength, and also the absolute value difference of time 1 and time 2 attitudes (a proxy of attitude consistency) within all 6 experimental conditions and the sample as a whole. Within each experimental condition, none of these five variables were found to be significantly correlated with the number of nodes (*p*s ≥ .065). Within all participants that created PAS maps (N = 80), node number was not significantly related to any of above variables (all ps ≥ 561). Interestingly, however, in the irrelevant map condition (N = 85), the number of nodes was related to PAS attitudes for time 1 ($r(83) = .22$, $p = .040$) and time 2 ($r(83) = .31$, $p = .004$; all other ps ≥ .581), indicating that individuals that think more in depth about cell phone use while driving have more positive attitudes toward PAS. However, altogether, the number of nodes participants indicated on relevant attitude maps was not substantially related to participants' attitudes, attitude strength, or attitude consistency.

[4]Religion (dummy coded) did not interact with the experimental conditions to affect attitudes, all *p*s > .180. However, it is important to note that the cell counts between religion (3 levels), map topic (2 levels), and partner attitude condition (2 levels) were low in number and uneven (ranging from N = 3 to N = 17), indicating that they were unlikely to yield significant differences using Analysis of Variance.

APPENDIX A
Online Questionnaire

Please answer all of the following questions using the scales below and *put your answer in the blank space.*
Please answer these questions about the chosen topic:

What is your attitude toward physician-assisted suicide? _____

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9
extremely negative — neutral — extremely positive

How strong is your attitude toward physician-assisted suicide? _____

1 2 3 4 5 6 7 8 9
Not very strong at all — very strong

How certain are you about attitude toward physician-assisted suicide? _____

1 2 3 4 5 6 7 8 9
Not very certain at all — very certain

How confident are you about your attitude toward physician-assisted suicide? _____

1 2 3 4 5 6 7 8 9
Not very confident at all — very confident

How often have you thought about physician-assisted suicide before today? _____

1 2 3 4 5 6 7 8 9
Not at all — Quite a bit

How likely is your attitude toward physician-assisted suicide to change? _____

1 2 3 4 5 6 7 8 9
very unlikely — very likely

How personally relevant is physician-assisted suicide to you? _____

1 2 3 4 5 6 7 8 9
Not very Relevant at all — very relevant

What is your attitude toward same-sex marriage? _____

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9

extremely negative — neutral — extremely positive

How strong is your attitude toward same-sex marriage? _____

1 2 3 4 5 6 7 8 9

Not very strong at all — very strong

How certain are you about attitude toward same-sex marriage? _____

1 2 3 4 5 6 7 8 9

Not very certain at all — very certain

How confident are you about your attitude toward same-sex marriage? _____

1 2 3 4 5 6 7 8 9

Not very confident at all — very confident

How often have you thought about same-sex marriage before today? _____

1 2 3 4 5 6 7 8 9

Not at all — Quite a bit

How likely is your attitude toward same-sex marriage to change? _____

1 2 3 4 5 6 7 8 9

very unlikely — very likely

How personally relevant is same-sex marriage to you? _____

1 2 3 4 5 6 7 8 9

Not very Relevant at all — very relevant

What is your attitude toward gun control? _____

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9

extremely negative — neutral — extremely positive

How strong is your attitude toward gun control? _____

1 2 3 4 5 6 7 8 9

Not very strong at all — very strong

How certain are you about attitude toward gun control? _____

1 2 3 4 5 6 7 8 9

Not very certain at all — very certain

How confident are you about your attitude toward gun control? _____

1 2 3 4 5 6 7 8 9

Not very confident at all — very confident

How often have you thought about gun control before today? _____

1 2 3 4 5 6 7 8 9

Not at all — Quite a bit

How likely is your attitude toward gun control to change? _____

1 2 3 4 5 6 7 8 9

very unlikely — very likely

How personally relevant is gun control to you? _____

1 2 3 4 5 6 7 8 9

Not very Relevant at all — very relevant

Need for cognition scale

Rate each item on the following scale:

-4 -3 -2 -1 0 1 2 3 4
Strongly Disagree Strongly Agree

1. I really enjoy a task that involves coming up with new solutions to problems. _____

2. I appreciate opportunities to discover the strengths and weaknesses of my own reasoning. _____

3. I would prefer my life to be filled with puzzles that I must solve. _____

4. I enjoy thinking about an issue even when the results of my thought will have no effect on the outcome of the issue. _____

5. I tend to set goals that can be accomplished only by expending considerable mental effort. _____

6. I am usually tempted to put more thought into a task than the job minimally requires. _____

7. I appreciate opportunities to discover the strengths and weaknesses of my own reasoning. _____

8. I usually end up deliberating about issues even when they do not affect me personally. _____

Need for closure scale

Rate each item on the following scale:

-4 -3 -2 -1 0 1 2 3 4
Strongly Disagree Strongly Agree

1. When faced with a problem, I usually see the one best solution very quickly. _____

2. I do not usually consult many different options before forming my own view. _____

3. I tend to streuggle with most decisions. _____

4. When considering most conflict situations, I can usually see how both sides could be right. _____

5. When thinking about a problem, I consider as many different opinions on the issue as possible. _____

6. Even after I've made up my mind about something, I am always eager to consider a different opinion. _____

7. I always see many possible solutions to problems I face. _____

8. When trying to solve a problem, I often see so many possible options that it's confusing. _____

Ten-Item Personality Inventory-(TIPI)

Here are a number of personality traits that may or may not apply to you. Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly
1	2	3	4	5	6	7

I see myself as:

1. _____ Extraverted, enthusiastic.
2. _____ Critical, quarrelsome.
3. _____ Dependable, self-disciplined.
4. _____ Anxious, easily upset.
5. _____ Open to new experiences, complex.
6. _____ Reserved, quiet.
7. _____ Sympathetic, warm.
8. _____ Disorganized, careless.
9. _____ Calm, emotionally stable.
10. _____ Conventional, uncreative.

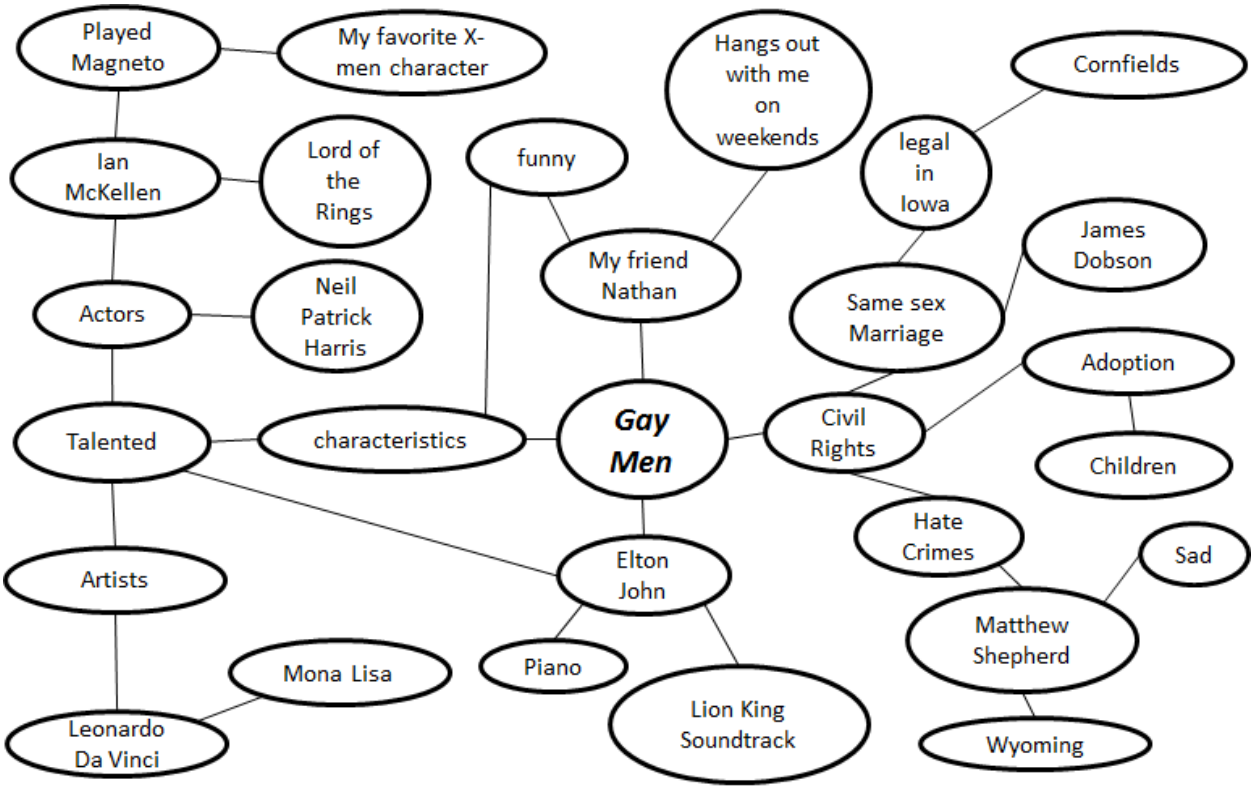
Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality, 37*, 504-528.

Self-Monitoring Scale

The statements below concern your personal reactions to a number of different situations. No two statements are exactly alike, so consider each statement carefully before answering. IF a statement is TRUE or MOSTLY TRUE as applied to you, **circle the "T"** next to the question. If a statement is FALSE or NOT USUALLY TRUE as applied to you, **circle the "F"** next to the question.

(T) (F) 1. I find it hard to imitate the behavior of other people.
(T) (F) 2. My behavior is usually an expression of my true inner feelings, attitudes, and beliefs.
(T) (F) 3. At parties and social gatherings, I do not attempt to do or say things that others will like.
(T) (F) 4. I can only argue for ideas which I already believe.
(T) (F) 5. I can make impromptu speeches even on topics about which I have almost no information.
(T) (F) 6. I guess I put on a show to impress or entertain people.
(T) (F) 7. When I am uncertain how to act in a social situation, I look to the behavior of others for cues.
(T) (F) 8. I would probably make a good actor.
(T) (F) 9. I rarely seek the advice of my friends to choose movies, books, or music.
(T) (F) 10. I sometimes appear to others to be experiencing deeper emotions than I actually am.
(T) (F) 11. I laugh more when I watch a comedy with others than when alone.
(T) (F) 12. In groups of people, I am rarely the center of attention.
(T) (F) 13. In different situations and with different people, I often act like very different persons.
(T) (F) 14. I am not particularly good at making other people like me.
(T) (F) 15. Even if I am not enjoying myself, I often pretend to be having a good time.
(T) (F) 16. I'm not always the person I appear to be.
(T) (F) 17. I would not change my opinions (or the way I do things) in order to please someone else or win their favor.
(T) (F) 18. I have considered being an entertainer.
(T) (F) 19. In order to get along and be liked, I tend to be what people expect me to be rather than anything else.
(T) (F) 20. I have never been good at games like charades or improvisational acting.
(T) (F) 21. I have trouble changing my behavior to suit different people and different situations.
(T) (F) 22. At a party, I let others keep the jokes and stories going.
(T) (F) 23. I feel a bit awkward in company and do not show up quite as well as I should.
(T) (F) 24. I can look anyone in the eye and tell a lie with a straight face (if for a right end).
(T) (F) 25. I may deceive people by being friendly when I really dislike them.

APPENDIX B


Played Magneto
My favorite X-men character
Hangs out with me on weekends
Cornfields
Ian McKellen
Lord of the Rings
funny
legal in Iowa
James Dobson
My friend Nathan
Same sex Marriage
Actors
Neil Patrick Harris
Adoption
Talented
characteristics
Gay Men
Civil Rights
Children
Hate Crimes
Sad
Artists
Elton John
Matthew Shepherd
Mona Lisa
Piano
Lion King Soundtrack
Leonardo Da Vinci
Wyoming

APPENDIX C

Gender: _____Male/Female_____

Age: _____21_____

Year in school (please circle): Freshmen Sophomore Junior Senior

Major: _____Psychology_____

Hometown: _____Detroit_____

Hobbies:

Hanging out with friends, Music, Sports, Reading, Watching television _____

_____

_____

Comments (optional):

_____"I think that physician assisted suicide is a very important issue. I'm actually very much in support/against physician assisted suicide."_____

_____

*This text on this sheet was hand-written when used in the experiment.

APPENDIX D

Please answer all of the following questions using the scales below and *put your answer in the blank space.*
Please answer these questions about the chosen topic:

What is your attitude toward physician-assisted suicide? _____

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9
extremely negative — neutral — extremely positive

How strong is your attitude toward physician-assisted suicide? _____

1 2 3 4 5 6 7 8 9
Not very strong at all — very strong

How certain are you about attitude toward physician-assisted suicide? _____

1 2 3 4 5 6 7 8 9
Not very certain at all — very certain

How confident are you about your attitude toward physician-assisted suicide? _____

1 2 3 4 5 6 7 8 9
Not very confident at all — very confident

How often have you thought about physician-assisted suicide before today? _____

1 2 3 4 5 6 7 8 9
Not at all — Quite a bit

How likely is your attitude toward physician-assisted suicide to change? _____

1 2 3 4 5 6 7 8 9
very unlikely — very likely

How personally relevant is physician-assisted suicide to you? _____

1 2 3 4 5 6 7 8 9
Not very Relevant at all — very relevant

What is your attitude toward same-sex marriage? _____

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9

extremely negative — neutral — extremely positive

How strong is your attitude toward same-sex marriage? _____

1 2 3 4 5 6 7 8 9

Not very strong at all — very strong

How certain are you about attitude toward same-sex marriage? _____

1 2 3 4 5 6 7 8 9

Not very certain at all — very certain

How confident are you about your attitude toward same-sex marriage? _____

1 2 3 4 5 6 7 8 9

Not very confident at all — very confident

How often have you thought about same-sex marriage before today? _____

1 2 3 4 5 6 7 8 9

Not at all — Quite a bit

How likely is your attitude toward same-sex marriage to change? _____

1 2 3 4 5 6 7 8 9

very unlikely — very likely

How personally relevant is same-sex marriage to you? _____

1 2 3 4 5 6 7 8 9

Not very Relevant at all — very relevant

What is your attitude toward gun control? _____

-9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9

extremely negative — neutral — extremely positive

How strong is your attitude toward gun control? _____

1 2 3 4 5 6 7 8 9

Not very strong at all — very strong

How certain are you about attitude toward gun control? _____

1 2 3 4 5 6 7 8 9

Not very certain at all — very certain

How confident are you about your attitude toward gun control? _____

1 2 3 4 5 6 7 8 9

Not very confident at all — very confident

How often have you thought about gun control before today? _____

1 2 3 4 5 6 7 8 9

Not at all — Quite a bit

How likely is your attitude toward gun control to change? _____

1 2 3 4 5 6 7 8 9

very unlikely — very likely

How personally relevant is gun control to you? _____

1 2 3 4 5 6 7 8 9

Not very Relevant at all — very relevant

Mood scale

(Ledgerwood et al., 2010)

In general, how do you feel right now? (Please Circle)

-4	-3	-2	-1	0	1	2	3	4
Very Negative								Very Positive

Social Issue Interest

How interesting do you find the topic of physician-assisted suicide to be?

-4	-3	-2	-1	0	1	2	3	4
Not very Interesting								Very Interesting

Social preferences scale
(DeWall, Visser, Levitan, 2006)

Rate each item on the following scale:

-4 -3 -2 -1 0 1 2 3 4
Strongly Disagree Strongly Agree

1. There's nothing wrong with going along with what others say in order to get along with them. _____

2. I think it is desirable to go along with the opinions of others when confronted with a controversial issue. _____

3. I think it is usually better not to point out a weakness in another person's argument, even if I am good friends with that person. _____

4. Although I may enjoy the value of a good argument, it is sometimes more important to be a good listener. _____

Interaction Expectations Scale

Rate each item on the following scale:

Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly
1	2	3	4	5	6	7

1. Given their description on the background sheet, I expect to get along with my partner. _____

2. I plan on having a debate during the upcoming discussion. _____

3. I'm looking forward to the discussion with my partner. _____

4. My partner's views could influence the way I think about our discussion topic. _____

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ABSTRACT

CONCEPT MAPPING AS A BUFFER AGAINST EVALUATIVE FLEXIBILITY

by

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Attitude relevant knowledge is a central component to evaluative consistency and attitude representation. One way to assess the degree to which individuals deliberate and represent their knowledge is through concept mapping. Therefore, the present research investigated whether concept map deliberation moderated attitude consistency in a two-part experiment. Participants (N = 172) completed an online survey assessing personality, attitudes, and attitude strength toward physician assisted suicide (PAS). In a second onsite sessions participants were randomly assigned create an attitude-relevant or attitude-irrelevant concept map, and were randomly assigned to work with a fictitious partner who had a positive, negative, or unknown attitude toward PAS, which served as a source of social influence. Participants again reported attitudes and attitude strength. Results indicated that concept map relevance did not moderate PAS attitude consistency. Possible reasons for the null findings and future directions for research are explored.

AUTOBIOGRAPHICAL STATEMENT

Keith Welker graduated with a B. S. in Psychology from Grand Valley State University in 2008. He is currently working toward a doctoral degree in psychology from Wayne State University with a focus in social psychology and a minor in quantitative methods.