

THE EFFECTIVENESS OF PERSUASIVE APPEALS AFTER PRIMING FAITH AND TRUST IN GOD

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A Thesis

Presented to

The Faculty of the Department

Of Psychology

University of Houston

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In Partial Fulfillment

Of the Requirements for the Degree of

Master of Arts

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By

Judy Tidwell

November, 2011

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ABSTRACT

Priming faith and trust in God was expected to increase the effectiveness of a subsequent persuasive message on Christian participants. Argument quality was manipulated and message-relevant thoughts were evaluated in order to determine if persuasion occurred via the central or peripheral route. Message relevance was also manipulated. It was hypothesized that when relevance was low, faith would act as a cue leading to greater persuasion for those primed, regardless of argument quality, and when relevance was high, that participants would have more favorable thoughts about and be more persuaded by strong compared to weak arguments. I expected that this general effect of argument quality would be somewhat attenuated in the high relevance group for those primed with faith because faith would serve multiple roles and would simultaneously act as a cue to think less. The religious prime would also bias the thoughts that did occur, leading to more favorable thoughts and attitudes in this condition. Most of the predicted effects did not emerge; however, I did find an argument quality main effect on attitudes and thoughts, and I also found that people who are less trusting of others exhibited more persuasion after receiving a faith/trust prime, as opposed to a neutral prime. Possible theories regarding why predicted results were not obtained, and avenues for further research are discussed.

*Keywords:* attitudes, faith, persuasion, priming, religion, trust

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### The Effectiveness of Persuasive Appeals after Priming Faith and Trust in God

Many people have studied persuasion as well as the psychology of religion, but not much research has been done regarding persuasion within a religious context. Within a typical religious ceremony, such as a church service, there are frequently requests for the members of the congregation to have faith and to trust in God. The appeal to have faith is seen as fundamental to religion, and is very highly emphasized at most religious gatherings. Calls to have faith are such an integral part of the social atmosphere at many informal religious gatherings, that followers who exhibit a lack of faith, such as by asking questions indicative of doubt, are sometimes met with social disapproval. Having faith and trusting in God is a very important component for a religious individual because it helps maintain other more central functions of religious belief, such as deriving meaning from life, regaining a sense of control, reducing feelings of guilt, facing fears (such as fear of death and other things which people cannot control), relieving anxiety, combating loneliness, meeting needs for acceptance, and providing a sense of growth (Hood, Spilka, Hunsberger, & Gorsuch, 1996). Some have argued that the propensity for religious belief evolved in the human mind as we became aware of our inevitable death, and needed to develop a psychological strategy to cope with this realization (Alper, 2006, Wilson, 1979, 1998). People may follow a religion for a variety of reasons, and these reasons are usually specific to the individual; however, having faith and trusting in God is an integral part of the religious experience for most believers.

In my research, I have addressed the impact that requests to have faith and trust in God have on a religious individual's subsequent ease of persuasion. Individuals were primed to be in a state of having faith and trusting in God (this process hereafter referred to as a 'faith/trust prime'), presenting a completely unrelated persuasive message, and then measuring the resulting levels of persuasion. In order to frame such a task, prior research in the areas of persuasion, priming, and religion must be each considered separately, and then integrated together to form a cohesive framework.

### *Persuasion*

Persuasion is a topic in social psychology that has been studied quite extensively. Different models depicting methods of persuasion have been devised, but one of the most frequently used of these models is the Elaboration Likelihood Model, (ELM; Petty & Cacioppo, 1986; Petty & Wegener, 1999). According to the ELM, there is a continuum of elaboration ranging from low elaboration (little thought) to high elaboration (a lot of thought). There are two routes to persuasion: the *central route* and the *peripheral route*. The central route to persuasion involves putting a lot of thought into carefully evaluating a message based on logic and the merits of its arguments; this manner of thinking is also referred to as *high elaboration*. The peripheral route to persuasion involves putting very little thought into evaluating a message and, instead, using cues to determine if an argument will be accepted (Petty & Wegener, 1998); this manner of thinking is also referred to as *low elaboration*. The two main factors that determine which route a person will use to process a message are motivation and ability. High elaboration requires a strong desire to process the message (Petty & Cacioppo, 1979) as well as the ability to evaluate it critically (Petty, Wells, & Brock, 1976). Many different variations of persuasive messages have been tested within this framework to determine what types of messages lead to what types of persuasion, as well as the mechanisms of the resulting attitude change.

Another frequently used model designed to elucidate the persuasion process is called the Heuristic Systematic Model (HSM; Chaiken, 1987). According to the HSM, people can process attitude-relevant information in two ways: via *systematic processing* and/or via *heuristic processing*. Systematic processing relies on careful scrutiny and deliberate evaluation of arguments. Heuristic processing, on the other hand, relies on shortcut rules, or “heuristics,” that aid in the processing of information; this type of processing takes little cognitive effort. Heuristics are presumed to be stored in memory, much like other forms of knowledge. According to this model, people approach attitude-relevant information using what the model refers to as the *sufficiency principle*. This principle states that people are

motivated to satisfy their current motivational concerns while expending as little cognitive effort as possible. Regarding any given judgment, people will notice their current level of confidence, referred to as their *actual confidence*, and compare that with their *desired confidence* (also referred to as their *sufficiency threshold*). If they feel like their actual confidence level is less than their desired confidence level, they will be motivated to close this gap by expending more effort to process the message. The confidence that is sought can be related to how accurately they feel that they interpreted the message, or it can be related to other concerns such as defending self-relevant attitudes or worldviews (referred to as *defense motivation*). It can also be related to whether or not their chosen attitudes make others look upon them favorably (referred to as *impression motivation*). Basically, people just want their current motivational concerns to be satisfied, whether they relate to accuracy, defense, or impression motivations.

Both the ELM and the HSM address the role that unconscious influences can play in a persuasion setting, however each model integrates these influences into its overall framework in a different manner. With regard to the HSM, Chen and Chaiken (1999) specifically acknowledge “the power of motives to guide thought and behavior without perceivers’ conscious knowledge of such influences.” The HSM describes heuristic processing, since it is less demanding of cognitive resources, as either a conscious or an unconscious process driven by either conscious or unconscious motives. Systematic processing, on the other hand, is generally seen as a conscious process; however the *motives* behind the processing may be conscious or they may remain unconscious, such that people may be completely unaware of what motivated them to think critically.

Regarding heuristic processing, people are typically said to be aware of a heuristic cue in their environment, but they may not be aware of how this cue is unconsciously affecting their judgments. People may be unaware of their subjective experiences as sources of judgment-relevant information, and thus may be unaware of how these experiences influence their thoughts and judgments (Chen &

Chaiken, 1999). This concept can be compared to a typical priming experiment in which people are aware of the prime, but they have no idea how it affected their judgment and/or subsequent behavior (e.g., Bargh, 1992). It has also been found that when people are aware of a heuristic cue and are *also* aware of the effect it could have on their judgment (physical beauty is a great example), they may expend extra cognitive effort to ensure that they are not affected as such (Lombardi, Higgins, & Bargh, 1987; Martin, Seta, & Crelia, 1990, for a review see Strack & Hannover, 1996). Knowing that people have to expend extra effort to ensure that they are not affected by a heuristic cue supports the idea that heuristic cues can operate automatically in cases where perceivers are not motivated or able to make the necessary corrections.

The HSM also acknowledges familiarity and ease-of-retrieval experiences as two subjective experiences which may affect the processing of a message. If a person has been pre-exposed to an attitude object, they may be inclined to misattribute the familiarity they feel toward that object, when they encounter it again, to actual liking of the object. Also, people may misattribute the subjective sense of positivity associated with an ease-of-retrieval experience to the object that is being retrieved. This result has also been demonstrated when using a subliminal priming manipulation (e.g., Bornstein, 1989; Bornstein & D'Agostino, 1992). Typically in experiments such as these, research participants are experimentally induced to have a subjective experience that is unrelated to the actual persuasive message; they are then expected to misattribute this experience to the message itself, thus influencing judgments of the message (e.g., Jacoby et al., 1989, Schwarz et al., 1991). Basically, the HSM allows for people to make misattributions from cues or subjective states to attitude objects, and this is generally thought to occur unconsciously (this is obviously the case in the experiments using subliminal priming manipulations).

The ELM also addresses the role that unconscious influences can play in persuasion, and how these influences fit into the structure of the model. According to Petty and Wegener (1998), people



may experience peripheral route attitude change as the result of a number of methods, some of which include priming, evaluative conditioning, affective conditioning, mere exposure, and perceptual ease-of-retrieval. All of these methods have successfully led to attitude change, even when they were used in a subliminal manner. Take, for example, evaluative conditioning, which can be defined as a change in the valence of a stimulus that results from its simultaneous pairing with another stimulus. DeHouwer, Baeyens, and Eelen (1994) subliminally presented neutral words simultaneously with either positive or negative words. They found that participants subsequently evaluated the words that had been paired with positive words more positively than the words that had been paired with negative words.

Similar to evaluative conditioning, affective priming also changes the valence of a stimulus by presenting it with another stimulus, however, the other stimulus presented must be affect-inducing in nature, and it must be presented *prior* to the target stimulus. For example, in one study participants were subliminally exposed to positive photos (e.g., of people smiling) or negative photos (e.g., of snakes) and then rated a target person who was engaging in normal everyday activities. Participants who were exposed to the positive photos subsequently rated the target person in a more positive way than did those participants who were exposed to the negative photos (Krosnick, Betz, Jussim, & Lynn, 1992). Some researchers have argued that affective priming *must* be done subliminally in order for it to be successful (Murphy & Zajonc, 1993). Affective priming and evaluative conditioning are most likely to affect attitudes when the target stimuli have little prior meaning to people, as well as when people have little motivation or ability to process centrally (Zajonc, 1998).

The process of mere exposure has also been shown to influence attitudes. Kunst-Wilson and Zajonc (1980) found that people preferred images of polygons that they had been previously exposed to, even though they were not able to remember that they had previously encountered those particular polygons. Also, although a person may not consciously recognize that a stimulus has been presented

repeatedly in the past, they will feel a sense of familiarity upon encountering the stimulus and may misattribute this ease-of-retrieval to actual liking for the stimulus.

The main difference between the HSM and the ELM, with regard to the role of unconscious influences, is that the HSM labels all such influences as heuristics, while the ELM places them all in the realm of peripheral processes. Both models specifically mention mere exposure, priming, and ease-of-retrieval experiences as types of unconscious influences, however only the ELM specifically discusses affective priming and evaluative conditioning.

### **Priming**

This experiment used a priming manipulation; therefore priming is the unconscious influence that is of most interest in this case. Priming is said to occur when a recent or current experience automatically creates internal readiness; this can happen when mental representations are activated in the mind and end up playing a role in a later response function. Priming can also be said to occur when the recent use of a concept in one task leads to an increased probability of its usage (or the usage of similar concepts) in a subsequent, unrelated task (Bargh & Chartrand, 2000). According to Anderson (2000), there is evidence that memory structures are connected in a network of related concepts. When one concept is activated through priming, related concepts are more likely to be activated as well. The more links that exist between a concept and a related concept, the more likely the second concept will be activated after the first concept is primed. Priming can also be described as a type of 'spreading activation' where one node is activated (via the priming manipulation), and how far this activation spreads to other nodes depends on the strengths of the linkages in memory between each node (Anderson, 1983). In a 2006 study, researchers presented participants with lists of words and non-words, and asked that they classify each as either a word, or a non-word. They found that participants were able to classify actual words as words more quickly when they had just been subconsciously primed with conceptually related words. fMRI technology was used to view brain activity during these

tasks; it was found that priming had the greatest effect, reaction time was the fastest, and cortical activation was the lowest for word pairs that were highly associated with one another (Wible, Han, Spencer, Kubicki, Niznikiewicz, Jolesz, McCarley, & Nestor, 2006). Since the cerebral cortex can generally be thought of as the location for higher-level brain processes such as attention, perceptual awareness, critical thinking, language, and consciousness (Kolb & Whishaw, 2003), it makes sense that an unconscious priming manipulation would activate less of this “conscious” region when highly associated word pairs were used.

Quite a few experiments have demonstrated the effects of priming on subsequent thought and behavior. In prior experiments, various stimuli have been used as primes, such as concepts, stereotypes, emotion words, symbols, relationship partners, and beliefs. Priming has been used to induce, among other things, behavior, goal activation, goal pursuit, and judgment. Some of these effects have recently been demonstrated using religious primes as well. Many of them have also been demonstrated using subliminal primes; this provides more evidence supporting the existence of a connectionist framework in the mind.

In a classic set of studies done by Bargh (1996) he demonstrated how primes can affect behavior. In his first study, he primed the concept of rudeness, and found that those who received the prime were more likely to interrupt the experimenter in a subsequent interaction. In his second study, he primed participants with concepts related to the elderly; those that received these primes walked out of the experimental setting significantly more slowly than those that did not receive a prime. In his third study, he subliminally exposed only one group to pictures of African-American faces. Those that were exposed to this prime tended to act more negatively to an imposing request from the experimenter than those who did not receive the prime. In a study done by Dijksterhuis and van Knippenberg (1998), they showed that people who were primed with the category of ‘college professor’ scored significantly better on a subsequent general knowledge test when compared to those who did

not receive the prime. It has also been shown that nonconsciously priming emotion concepts can affect subsequent behavior. In one set of studies, participants were primed with adjectives relating to either guilt or sadness. It was found that those primed with guilt subsequently showed lower indulgence as well as more helping behavior than those who were primed with sadness (Zemack-Rugar et al., 2007).

Bargh et al. (2001) also demonstrated that behavioral goals can be activated outside of conscious awareness, and then operate nonconsciously to direct goal-related behavior. These experimenters primed the goal to perform well in one experiment, as well as the goal to cooperate in another experiment. Both of these primes were successful in eliciting the goals as well as the related goal-directed behaviors. It has also been demonstrated that priming people's relationship representations can trigger related interpersonal goals that are then pursued outside of conscious awareness within the current situation (Fitzsimons & Bargh, 2003).

### **Religion and Priming**

Priming manipulations have also begun to be used in the religion literature, where effects have been found as well. Exposure to any type of religious material (e.g., religious music or Bible verses) can lead to the spontaneous activation of corresponding beliefs (Wenger, 2003). In one study, Wenger (2004) primed students with the words 'housetop,' 'student,' or 'Christian,' and then measured how quickly they could identify whether different actions were student-related, Christian-related, or were not really actions at all. Wenger also measured levels of intrinsic and extrinsic religious orientations. An intrinsic orientation is one in which a person has internalized their beliefs and tries to live by them in as many ways as they possibly can; it can also be thought of as a meaning-endowing framework through which all of life is understood (Donahue, 1985). An extrinsic orientation is one which a person uses religion for external reasons such as comfort and social status (Allport & Ross, 1967). Wenger found that those primed with the word 'Christian' were able to identify Christian-related actions significantly more quickly than student-related actions, but only when they had an intrinsic orientation. This

supports the idea that automatic activation of related concepts depends on the strength of the linkages between the first concept and any related concepts. It makes sense that individuals with an intrinsic religious orientation would have stronger linkages between the word 'Christian' and Christian-related actions since they, by definition, should be constantly trying to apply the tenets of their religion in as many ways as possible. This also suggests that an extensive mental framework of religious concepts is more likely to exist for those with a high commitment to religion, such that priming religious concepts would affect this group of individuals more than it would affect others. In another example, intrinsic religiosity was found to predict decreased moral hypocrisy, but only when religiosity was primed (Carpenter & Marshall, 2009).

In another study done by Randolph-Seng and Nielsen (2007), they primed participants with sports-related, neutral, or religious words. They then gave them an enticing opportunity to cheat on a task, and measured the amount of cheating that actually occurred in each group. Participants who had experienced the religious prime cheated less than those in all other groups; this provides further support that priming religious concepts can affect subsequent thought and behavior.

Another study done by Wenger (2003), found that 'committed' religious participants who had been subliminally primed with words related to religious belief were more likely to apply these primed beliefs to their answers when they were asked: "In your opinion, what have been the three greatest events in the history of the world?" Committed religious participants who were not primed listed a Biblical event 20% of the time, compared to 48% of the time for committed religious participants who were primed. 'Commitment' in this case was determined by asking participants to rate their 'level of commitment to the teachings of their religion' on a 7-point scale; a person with a rating of 4 or above was considered to be 'committed.' While this construct of commitment is not exactly the same as an intrinsic religious orientation, the concepts may be similar.

### **Religion and Critical Thinking**

One last area of research to consider addresses critical thinking skills in relation to religiosity. Critical thinking can be defined as “reasonable, reflective thinking that is focused on deciding what to believe and do” (Norris & Ennis, 1989). There have been conflicting results in this area of research, and most of the research has been done with regard to ‘paranormal belief,’ a broader category of which religious belief is considered to be a subset. Paranormal belief can be defined as a belief in anything that is irreconcilable with current scientific understanding, or at least not able to be explained without major revisions to that understanding (Tobacyk & Milford, 1983). Some examples of paranormal beliefs are traditional religious beliefs, psychic beliefs, superstitions, precognition, witchcraft, and belief in unusual life forms such as aliens.

Some researchers have found paranormal belief to be negatively correlated with certain forms of critical thinking, like induction, deduction, and inference (Alcock & Otis, 1980; Irwin, 1991; Merla-Ramos, 1999; Morgan & Morgan, 1998; Tobacyk & Milford, 1982; Wierzbicki, 1985). Of these six studies, three of them found significant global negative correlations between critical thinking and paranormal belief (Alcock & Otis, 1980; Tobacyk & Milford, 1982; Wierzbicki, 1985). Another study found critical thinking to be negatively correlated with paranormal belief, but only when the critical thinking task contained information specific to paranormal belief (Merla-Ramos, 1999). Morgan and Morgan (1998) found this negative correlation as well, but only for a specific dimension of critical thinking: evaluation of arguments. Irwin (1991) found high levels of traditional religious belief to be negatively correlated with reasoning ability.

It is debatable how well the results of these studies regarding the more general category of ‘paranormal’ belief can apply specifically to belief in Christianity, but these studies are all that we have to go on at this point. This topic could be something for psychologists to research in the future. Despite these limitations, an interesting pattern has emerged: the studies in which participants were measured for levels of paranormal belief right before they were given the critical thinking measure showed the

largest negative correlations between paranormal belief and critical thinking. These studies are comparable to a priming manipulation due to the order of presentation and the very short time lapse between measures. The remaining studies, on the other hand, either had a large amount of time pass between the two measures, or measured the items in the reverse order (i.e., measuring critical thinking before measuring paranormal belief). This suggests that priming religious belief, specifically Christianity, could possibly lead to a decrease in critical thinking.

Another study in this area primed religious schemas in some participants and found that this did not lead to poorer critical thinking when compared to those who had not been primed (Kirby, 2008). However, upon closer examination of the study, an alternative explanation can be proposed. Participants were primed using one of two passages: a religion-related passage or a neutral passage. The religion-related passage contained arguments in favor of intelligent design, which is a religious topic upon which believers typically *do* think critically about, and are motivated to do so. The neutral passage, on the other hand, was an encyclopedia-like entry about salmon; it was very factual and dry; it is hard to imagine how this could motivate anyone to think critically. It is possible that the specific results of this study were obtained because the religion-related prime actually elicited critical thinking in addition to priming religious schemas, whereas the neutral passage did not elicit critical thinking at all.

### **The Present Research**

To summarize what has been reviewed thus far, we know that priming can influence subsequent thought, behavior, and goals, and that this also works in cases specific to religiosity. We have also seen that priming paranormal belief right before a critical thinking task can lead to a decrease in critical thinking in most cases, although this cannot be asserted conclusively. Prior to this study, it had yet to be examined how priming religious faith and trust in God would affect persuasion regarding a subsequent, unrelated topic. I originally predicted that after priming Christian participants to be in a state of trusting in God, that this state of trust would ‘spill over’ to the next task and affect levels of persuasion regarding

the subsequent message. Specifically, I expected the faith/trust prime to lead to less thought and greater overall persuasion.

In my study, I primed individuals with the concept of faith/trust in God, gave them a completely unrelated persuasive message, and then measured subsequent levels of persuasion. My experiment took the form of a 2 (Prime: faith/trust or neutral) X 2 (Relevance: high or low) X 2 (Argument Quality: strong or weak) between-subjects factorial design. Argument quality was used as a manipulation in order to assess the level of elaboration. The logic behind using argument quality as a tool in this manner is the idea that when people are thinking more, which they are more likely to do when the message concerns a highly relevant topic, they should be able to distinguish between strong and weak arguments more easily. Relevance was manipulated in order to see how faith/trust operated at high and low levels of elaboration.

Based on the previously cited evidence, I expected to find a main effect for prime, such that individuals primed with faith/trust in God would be more easily persuaded when compared with individuals who were primed with a neutral prime (see Appendix A for an illustration of predictions). I also expected to find an argument quality main effect for those in the high-relevance group such that those who received highly-relevant strong arguments would be more persuaded than those who received highly-relevant weak arguments (see Petty & Wegener, 1999), regardless of prime condition. I expected to find a 3-way interaction such that there would be an Argument Quality X Prime interaction in the high-relevance group, but not in the low-relevance group. In the high-relevance group, I expected that those who received the neutral prime would be more persuaded by strong compared to weak arguments. However, I expected that those who received the faith/trust prime would be *moderately* persuaded by strong arguments. In other words, I expected a smaller argument quality effect for the faith prime group than the neutral prime group in the high relevance conditions. I expected this to occur because the faith/trust prime would simultaneously: 1) reduce critical thinking by acting as a cue,



as well as 2) bias the thoughts that do occur. In the low-relevance condition I predicted only a main effect of prime, because in this case I thought that faith/trust would simply serve as a positive cue. I expected a three-way interaction on thought favorability such that those in the high relevance neutral prime condition would have more favorable thoughts in response to strong vs. weak arguments. I also predicted a moderate effect of argument quality on thoughts for the faith/trust vs. neutral prime participants in the high relevance condition.

## **Method**

### **Participants**

Three-hundred and twenty four participants from psychology classes at the University of Houston participated in this study in exchange for extra credit in their courses. Two-hundred and eighty one of these participants were classified as either Christian or Catholic, while forty-three of these participants were classified as either Atheist or Agnostic. There were not enough Atheist or Agnostic students who participated in the study to allow their data to be included in analyses. All participants were randomly assigned to a condition in a 2 (Prime: faith/trust or none) X 2 (Relevance: high or low) X 2 (Argument Quality: strong or weak) between-subjects factorial design. Participants were required to *not* be seniors. The final sample that was analyzed consisted of participants who were all either Christian or Catholic, a majority of which were female (79.72%). The sample varied widely in terms of age, with a mean of 21.61 years of age and a standard deviation of 4.89 years. The sample also varied in terms of ethnicity, with 21.00% African Americans, 14.59% Asians, 33.10% Caucasians, 28.83% Hispanic/Latino, and 2.49% who self-classified as "Other." With regard to classification, 18.80% were freshmen, 29.32% were sophomores, and 51.88% were juniors.

### **Procedure**

Participants signed up for the study online via the Sona research management system; here they saw the study listed as "Three Surveys." The Sona system filtered out any participants who were not

Christian, Catholic, Atheist, or Agnostic, as well as those who were seniors. Only the people who met these criteria were able to view and sign up for the study. The study itself was conducted online, making use of Qualtrics survey software. Participants registered for a timeslot on the Sona system. The study was described as three short studies lumped together for convenience; the first study concerning preference ratings, the second study concerning university issues, and finally a short questionnaire at the end. The whole study was described as lasting about 45 minutes to an hour, and participants received an hour of research credit for their participation. Once they choose to participate, Sona linked them to the survey hosted on the Qualtrics website for them to begin the study, which was able to be completed from an internet location of their choosing.

**Priming conditions.** Participants in the faith/trust prime conditions were told that we were interested in types of Bible verses people generally prefer in terms of understandability. They were given fifteen Bible verses related to faith (see Appendix B), and were asked to rate each verse according to its ease of understanding on a scale of 1 to 9, 1 being ‘very difficult to understand’ and 9 being ‘very easy to understand.’ Their ratings on this task had no meaning related to the true purpose of the experiment; the purpose of this task was to prime these participants with the concepts of faith and trust in God. Participants in the neutral prime conditions were told that we were interested in people’s preferences for certain types of sentences in terms of understandability. They were given fifteen sentences or very short paragraphs related to various non-religious topics (see Appendix C); they were asked to rate each one according to its ease of understanding on the same 1 to 9 scale as that of the faith/trust prime group. The sentences/paragraphs in the neutral-prime condition mirrored the lengths of the Bible verses in the prime condition.

**Argument quality conditions.** Both groups were then told that they were beginning the second study. It was presented as a survey from the University of Houston itself designed to get some psychology students’ thoughts regarding the possible implementation of senior comprehensive exams.

This topic was chosen because it has been used frequently in prior persuasion research (e.g., Priester & Petty, 1995). Participants were told that they would each read one of five essays regarding these exams, exams which were described as covering material specific to each student's major; passing these exams was described as a prerequisite for graduation.

**Pilot studies.** Prior to this study, two pilot studies were conducted in order to ensure that the arguments were having the desired effect. In the first pilot study, participants were given 18 arguments (9 strong and 9 weak – see Appendix D); they were asked to rate the strength of each argument on a 7-point scale from strong to weak. This first study was used to narrow down the 18 strong and weak arguments that Petty and Cacioppo used (1986) to a more manageable number. The four strongest and four weakest arguments were chosen. In the second pilot study, participants were given either the four strong or the four weak arguments, were asked to think carefully about the arguments, and were then asked to list their thoughts. Thought listing (described in more detail in Appendix H) is the method typically used to show that arguments are either strong or weak – strong arguments should elicit favorable thoughts when thoughts are listed, whereas weak arguments should elicit unfavorable thoughts, each when relevance is high. The purpose of the second pilot study was to make sure that the arguments had their desired effect of being strong or weak.<sup>1</sup>

**Relevance conditions.** Participants received either the four strong or the four weak pre-tested arguments mentioned above; the two sets of four arguments were each consolidated into coherent essays (see Appendix E for Argument Quality Essays). Before receiving the arguments, participants in the high-relevance conditions were told that the University of Houston is currently considering implementing the exams next year. Participants in the low-relevance conditions were given the same essays, except they were first told that other universities have implemented the exams, but the University of Houston is not currently considering the proposition (see Appendix F for essay instructions and relevance manipulations).

**Attitude questions and manipulation checks.** Next, participants answered a few questions regarding their present attitude toward the senior comprehensive exams. They were first asked “Generally speaking, what is your opinion regarding the implementation of senior comprehensive exams?” They responded on a 7-point scale with 1 equal to *strongly oppose* and 7 equal to *strongly favor*. After this question, a seven-item semantic differential scale followed, and participants were asked to “rate how you feel about the implementation of senior comprehensive exams.” The semantic differentials were on 7-point scales with *foolish, harmful, negative, bad, unfavorable, undesirable, and dislike* equal to 1, and *wise, beneficial, positive, good, favorable, desirable, and like* equal to 7 (see Appendix G). Participants were then asked two questions on 7-point scales as manipulation checks: “How would you rate the quality of the arguments that you read in the message?” with 1 equal to *very weak* and 7 equal to *very strong*, and “How would you rate the personal importance of the message?” with 1 equal to *very unimportant to me personally* and 7 equal to *very important to me personally*.

**Thought listing.** Next, all participants were given instructions on how to list the thoughts they had during the message presentation (see Appendix H, Petty and Cacioppo, 1977), and then proceeded to do so. After completing these dependent measures, participants were told that they had reached the final survey.

**Additional measurement.** The final survey was described as addressing participants’ religious life, and contained questions from a variety of scales. Among the scales that were used, the Intrinsic-Extrinsic Motivation Scale (see Appendix I, Hoge, 1972) was designed to measure the motivation behind religious activity. It consists of 30 items that seek to distinguish between those who use religion mainly as an avenue to meet social needs, and those who are religious for intrinsic reasons, such as a genuine belief in the tenets proposed.

The Interpersonal Trust Scale (see Appendix J, Rotter, 1967) consists of 25 items, and, like its name implies, was designed to measure individuals’ trust in others, in a general sense. The scale

specifically addresses three factors that make up interpersonal trust: political trust, which is trust in politicians and the media, paternal trust, which is trust in authorities that would generally be classified as safe, such as parents or experts in a field, and trust of complete strangers, who may in fact have motives to exploit (Wright & Tedeschi, 1975).

The Harmony Control Scale (see Appendix K, Morling & Fiske, 1999) was designed to capture the tendency of individuals to accept existing events by turning to beliefs in a higher power, luck, and other people. The scale consists of 21 items, and is made up of five factors. The "Higher Power" subscale includes six items that refer to the influence of some higher power, such as a religious entity or fate. The "Friends Care" subscale includes six items intended to measure the tendency to trust in friends to fulfill needs and provide instrumental support in decisions. The "Anticipate Others" subscale includes four items intended to measure individuals' perceptions of the social advantage that results from actively meeting the needs of others. The "Merge with Others" subscale includes two items that measure a person's tendency to become absorbed in others to such an extreme that they forget their own wants. Lastly, the "Wait on Luck" subscale captures people's tendency to believe that good and bad luck even out, as far as outcomes are concerned.

The Dogmatism Scale (see Appendix L, Altemeyer, 2002) consists of 20 items that measure an individuals' tendency to declare their beliefs with rigid, arrogant, and absolute certainty. Dogmatic individuals refuse to change their minds about a given topic, even in the face of convincing evidence that should give reason to; they simply refuse to see things any other way, and fail to consider the possibility that they might be incorrect.

The state version of the PANAS scale (see Appendix M, Watson, Clark, & Tellegen, 1988) is a measure of the positive and negative affect that individuals are currently experiencing. Positive affect reflects the extent to which an individual feels active, alert, and enthusiastic, with those high in positive affect being energetic, engaged, and focused, and those low in positive affect being tired and feeling

sad. Negative affect reflects the extent to which an individual feels distressing and unpleasurable emotions such as anger, disgust, contempt, guilt, nervousness, and fear; those high in negative affect are experiencing a good deal of distressing emotions such as these, while those low in negative affect are feeling peaceful and calm.

After filling out these scales, participants went through a funnel debriefing where they were probed for suspicion regarding the true purpose of the experiment, and were then thanked for their participation.

## Results

The data of 14 participants who did not list any thoughts during the thought-listing task were excluded from analyses, because this is one of the main dependent variables. One participant did not complete the study, and 8 participants said they did not read the essay, so their data were also excluded from analyses.

### Manipulation Checks

A 2 (prime) X 2 (relevance) X 2 (argument quality) ANOVA revealed a main effect of argument quality on *perceived* relevance,  $F(1,277) = 5.02, p < .05$ . Strong arguments ( $M = 4.77, SD = 1.69$ ) were perceived as significantly more relevant than weak arguments ( $M = 4.30, SD = 1.79$ ). In other words, people felt that strong arguments were more personally relevant to them than were weak ones. Also, the low relevance essays ( $M = 4.41, SD = 1.65$ ) were not *perceived* as significantly more or less relevant than the high relevance essays ( $M = 4.64, SD = 1.86$ ). In other words, there was no significant main effect found for relevance,  $F(1,277) = 1.30, p = .26$ .

A 2 (prime) X 2 (relevance) X 2 (argument quality) ANOVA revealed a main effect of argument quality on *perceived* argument quality,  $F(1,277) = 33.87, p < .001$ . Strong arguments ( $M = 4.87, SD = 1.55$ ) were perceived as significantly stronger than weak arguments ( $M = 3.84, SD = 1.48$ ). This means

that people were in fact paying attention, because they were able to correctly differentiate the strong from the weak arguments.

### **Attitudes**

After checking the alpha level for the scores from the eight attitude items ( $\alpha = .97$ ), they were used to form an attitude index. A 2 (prime) X 2 (relevance) X 2 (argument quality) ANOVA revealed only a main effect of argument quality on attitudes,  $F(1,277) = 37.25, p < .001$ . Strong arguments ( $M = 5.00, SD = 1.39$ ) elicited significantly more favorable attitudes than did weak arguments ( $M = 3.96, SD = 1.53$ ). Relevance was found to be marginally significant,  $F(1,277) = 3.58, p = .06$ , with the high relevance essay ( $M = 4.64, SD = 1.55$ ) eliciting more favorable attitudes than the low relevance essay ( $M = 4.31, SD = 1.55$ ). There were no significant interactions, and thus nothing was followed up with t-tests.

### **Thoughts**

Each individual's thought listings were rated by two judges ( $\kappa = .73$ ). The judges were blind to the condition of the participants as well as to the experimental hypotheses. Judges classified each thought as either: favorable, unfavorable, or neutral/irrelevant (Cacioppo & Petty, 1981). A thought index, which takes into account that some participants listed a differing total number of thoughts, was calculated by the following formula:  $(\# \text{ favorable thoughts} - \# \text{ unfavorable thoughts}) / (\# \text{ favorable thoughts} + \# \text{ unfavorable thoughts})$ . A thought index was created for each judge, and then these two thought indices were averaged to form an overall index. This index was used to assess the extent to which people in each condition were thinking critically, as evidenced by the favorability of thoughts they generated. A 2 (prime) X 2 (relevance) X 2 (argument quality) ANOVA revealed only a main effect of argument quality on thoughts,  $F(1,279) = 43.47, p < .001$ . Strong arguments ( $M = .15, SD = .75$ ) elicited significantly more favorable thoughts than weak arguments ( $M = -.41, SD = .68$ ).

### **Additional Predictors**

Since none of the results I had predicted came out as planned, I explored a few more questions with regard to the scales administered in Part 3 of the study. First, dichotomous variables were effects-coded such that a value of 1 indicates the presence of the manipulation described by the variable name, and a value of -1 indicates the absence of the manipulation described by the variable name. For example, regarding the variable titled “Prime,” a value of 1 indicates that the participant received the faith/trust prime, and a value of -1 means that they did not. Regarding the “Relevance” variable, a value of 1 indicates that the essay was framed as being personally relevant to the participant, and a value of -1 indicates that the essay was framed as being personally irrelevant. For the argument quality variable, “StrongArg,” a value of 1 indicates that strong arguments were received by the participant, and a value of -1 indicates that weak arguments were received. Next, the continuous predictors were centered by subtracting the mean of the scale from the scale score.

I ran regressions with relevance, argument quality, prime, one scale from Part 3 as the fourth predictor, and with the attitude index as the dependent variable. I re-ran this same regression including each scale from Part 3, and I also entered all interactions as predictors. I only included scales and subscales in the regressions that had a reliability of at least .70 (George & Mallery, 2003), which included: the Interpersonal Trust Scale ( $\alpha = .78$ ), the Harmony Control Scale ( $\alpha = .76$ ), the Higher Power Subscale of the Harmony Control Scale ( $\alpha = .84$ ), the Dogmatism Scale ( $\alpha = .89$ ), the PANAS Scale ( $\alpha = .82$ ), the Positive Affect Subscale of the PANAS Scale ( $\alpha = .74$ ), the Negative Affect Subscale of the PANAS Scale ( $\alpha = .75$ ), the Intrinsic/Extrinsic Religious Orientation Scale ( $\alpha = .79$ ), the Intrinsic Subscale of the Intrinsic/Extrinsic Religious Orientation Scale ( $\alpha = .95$ ), and the Extrinsic Subscale of the Intrinsic/Extrinsic Religious Orientation Scale ( $\alpha = .78$ ). Out of all of these analyses, I did find a Prime x Interpersonal Trust Scale (ITS) interaction when the attitude index was used as the dependent variable ( $\beta = -.137$ ,  $t(268) < .05$ , see Appendix N).



To further explore this interaction effect, separate regression lines were computed and tested for individuals one standard deviation below the mean on the ITS predictor, and one standard deviation above the mean of the ITS predictor. To create the variable representing those who were one SD below the mean, the SD of ITS was added to the centered ITS variable. To create the variable representing those who were one SD above the mean, the SD of ITS was subtracted from the centered ITS variable. Each of these variables was included in the original regressions in place of the centered ITS variable, and the main effect of prime was examined using the attitude index as the dependent variable, so this resulted in examining the results of two regressions. It was found that the people who are less trusting of others, generally speaking, exhibited more persuasion, as evidenced by the attitude index, after receiving the religious prime as opposed to the neutral prime ( $\beta = .24, p = .05$ ). For those who were high in trust, the prime did not influence attitudes ( $\beta = -.19, p = .13$ ).

I also wondered if an effect of the faith/trust prime was found, if it might have been trust in general that was coming into play, and not religious trust specifically. To address this concern, I opened up the pool of participants to include Atheist and Agnostic students; however, there were not enough of these students who participated in the study to allow their data to be considered in analyses, so this question could not be addressed.

### Discussion

A main effect of argument quality was found on both thoughts and attitudes; strong arguments elicited significantly more favorable attitudes and thoughts than did weak arguments, which was in line with predictions. This tells us that people were in fact paying attention to the messages they read. However there was no main effect of prime on either thoughts or attitudes; this was not in line with the prediction that those who had received the prime would exhibit more favorable thoughts and attitudes toward the message than those in the neutral prime condition. Also, a 3-way interaction between

argument quality, prime, and relevance was not present in the data as originally predicted. It was also found that strong arguments were more personally relevant to participants than were weak ones, and that participants were paying enough attention to be able to correctly differentiate the strong from the weak arguments. Upon performing additional analyses, a Prime x Interpersonal Trust Scale interaction was found on attitudes. What this means is that the people who are less trusting of others exhibited significantly more persuasion after receiving the religious prime compared to the neutral prime. For those who were high in trust, attitudes were not significantly influenced by the religious prime.

It seems a bit counterintuitive that less trusting individuals were more persuaded after a religious prime than they were after a neutral prime. One theory is that individuals high in interpersonal trust are already in a state of constant trust, such that a religious prime is not able to *increase* their level of trust by much. Individuals who are low in interpersonal trust, on the other hand, have some room to shift in their level of trust. Since the individuals in question were all Christian or Catholic in this case, maybe the generally distrustful subset of individuals, as their scores on the ITS scale imply, find religion to be an exception to their general state of distrust – in other words, one of the few areas in their life in which they do experience feelings of trust.

Overall, this study did not turn out as expected; there are a number of reasons this may have been the case. This study may have turned out differently due to a lack of efficacy of the priming manipulation. Maybe trusting in God has to be something that happens in an actual religious setting, or, at the bare minimum, a setting that feels private and safe. It is possible that just reading Bible verses about faith and trust on a computer screen in the context of a psychology experiment is not realistic enough to induce actual feelings of faith and trust. Maybe it is a combination of the religious setting itself, the *choice* to enter a state of trust during a religious ceremony, the feeling of being in a safe environment (as opposed to being placed “under a microscope” in a psychology experiment), and the

reality of being in a more realistic religious environment that combine to induce a feelings of faith and trust in God.

It is also possible that the task of having participants rate each Bible verses' "ease of understandability" served to remove the impact that such a prime would normally have by turning it into an evaluative task. In other words, instead of just reading the verses and being drawn into a state of trusting, participants were asked to *think* about and rate the ease of understandability of the verses. Maybe the act of rating these verses as such negated the ability of this prime to easily suppress thought and serve as a cue. It is possible that a "spillover effect" would occur more easily as the result of a more realistic and affective prime as opposed to a cognitive one. Experiencing genuine feelings of faith and trust in God may also be a highly emotional experience, and whether or not the prime used in this study was sufficiently realistic or affective is questionable.

There may also be a limit to what, if anything, a state of religious trust can spill over to influence. Secular issues such as whether or not one is in favor of senior comprehensive exams may not be something to which religious trust can easily spill over and influence. It is possible that the mind compartmentalizes religious and secular concepts in certain cases, and that the theorized spillover effect of trust only occurs when this compartmentalization has been breached. A spillover effect might happen more easily with regard to a persuasive topic or situation that elicited *some* conception of religious ideals or concepts. In other words, if we think of religious concepts as being compartmentalized in a certain area of the mind, some bit of this area needs to be activated during the persuasive message in order for the religious trust from this area to spill over into what the mind considers a totally different and unrelated topic. Think of it like a container full of water that cannot leak unless punctured. For example, if a salesperson was trying to convince a religious person, who had just attended a faith-inducing religious ceremony, to buy some Tupperware, and this salesperson mentioned that they are barely making ends meet, this might make the religious individual more

inclined to help, since their religion states that they should help the needy. Of course this decision may happen largely on a conscious level, but the trust previously induced by the religious ceremony may spill over and make this individual more easily persuaded to make a purchase, than if had they not just attended the trust-inducing religious ceremony. So in this situation, the comment by the salesperson regarding their troubled financial situation is what would effectively puncture the container that is holding the religious trust, thus allowing it to spill over and influence the person's ability to be persuaded about a seemingly unrelated topic, the purchase of Tupperware.

Another issue with the study was that a significant main effect of relevance on perceived relevance was *not* observed, which indicates that the relevance manipulation was not effective. This was most likely the fatal flaw that prevented the experiment from addressing all of the original research questions. The manipulation, which consisted of one sentence stating whether or not the University of Houston was currently considering implementing senior comprehensive exams next year, may not have been read by participants if they did not read the instructions thoroughly. Additionally, the relevance manipulation check consisted of one question asking participants to rate the personal importance of the message. This may have been a bit ambiguous, and the study may have been better served by including a more direct question, such as "Is the University of Houston currently considering implementing senior comprehensive exams?"

Also, it cannot be ensured that participants took the study itself seriously, as most participated simply as part of course requirements, and were most likely only concerned about finishing, and not about accuracy, although the fact that significant argument quality main effects were found on attitudes and thoughts shows that participants were thinking and thus putting some effort into the study. The fact that the study could be administered from any setting in which an internet connection was present may have resulted in participants taking the study from a variety of locations, many of which may have been distracting and not at all conducive to being in a genuine state of having faith and trusting in God.

Lastly, in the funnel debriefing none of the participants guessed the true experimental hypotheses; however quite a few of them thought that the study was designed to assess how individuals' religious beliefs affect secular areas of life, such as senior comprehensive exams. In other words, a good number of participants exhibited some suspicion and were able to clearly label part 1 of the study as religious in nature and part 2 of the study as non-religious in nature; they also felt that how much part 1 affected part 2 was the question being examined by the experimenter. Although they did not understand the true purpose of the study, they were correct that how part 1 affected part 2 was in fact being examined. This suspicion may have led participants to correct for any effect the prime would have had if they had not been aware of this stark contrast between parts 1 and 2, and had they not been in an unrealistic experimental setting where they were attempting to figure out the true purpose behind the study.

### **Future Directions**

Due to the challenges present in replicating realistic religious experiences in the laboratory, this line of research may be best served by beginning with less controlled field studies. For example, researchers could pretend to be salespeople selling a neutral item, such as dinnerware, and approach groups of religious individuals either 1) right after a religious ceremony in which faith/trust was realistically primed, or 2) right after a non-religious gathering. Although causality cannot be inferred as it could be in a controlled laboratory experiment, a field study such as this might be a first step in determining if there is even a phenomenon present worth exploring to begin with. If so, then researchers could try to pick apart the phenomenon in a more controlled laboratory setting.

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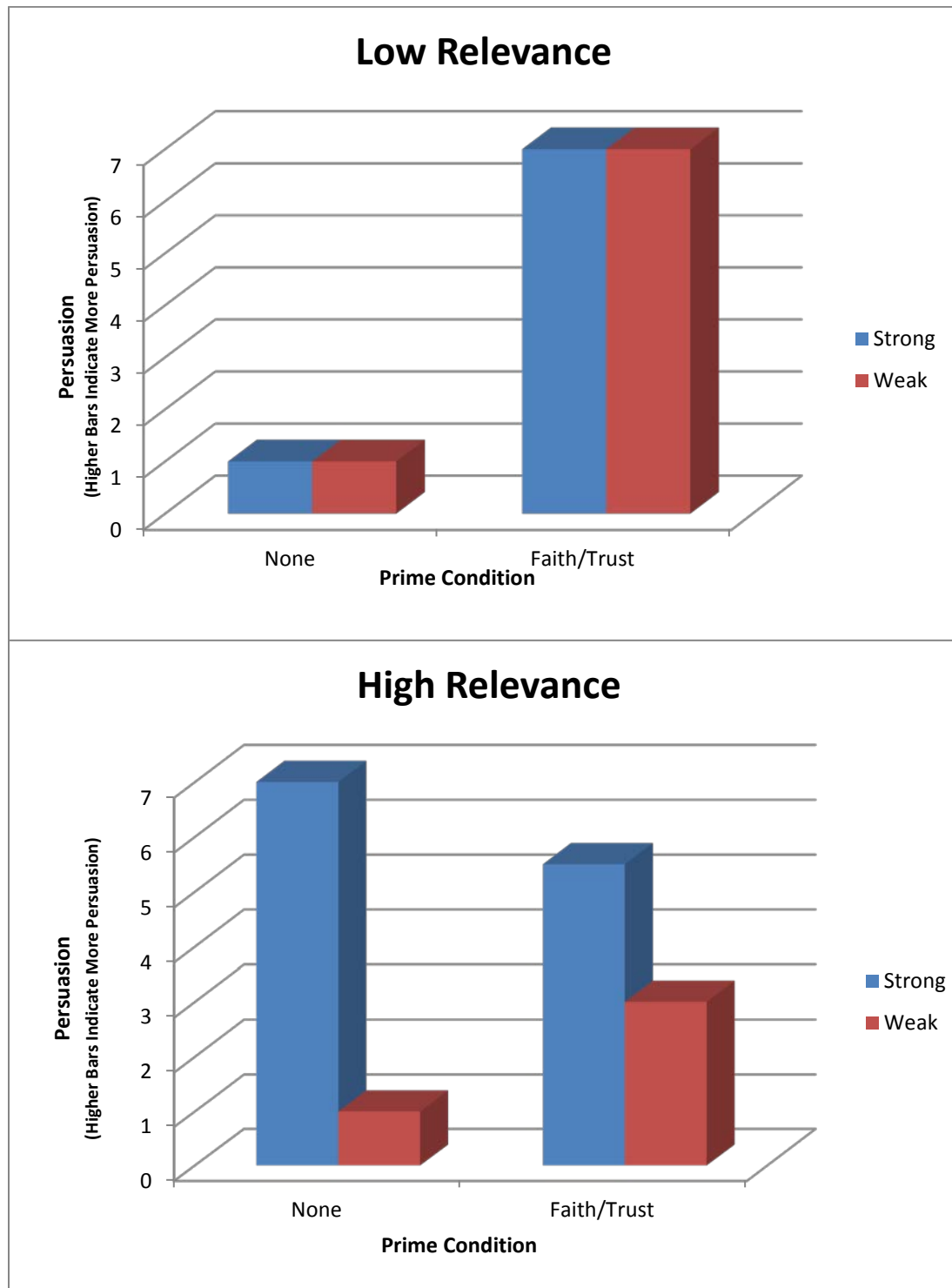
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## Footnote

<sup>1</sup> A one-way ANOVA was used to test for differences in resulting thought indices when participants were shown strong vs. weak arguments. Resulting thought indices differed significantly between those given strong arguments and those given weak arguments  $F(1,43) = 24.61$   $p < .001$ , such that those who received strong arguments ( $M = .45$ ,  $SD = .69$ ) had significantly more favorable thoughts than those who received weak arguments ( $M = -.57$ ,  $SD = .68$ ).

Appendix A – Predicted Results

Appendix B – Faith/Trust Priming Manipulation  
(all verses from NIV Bible)

Then he said to Thomas, "Put your finger here; see my hands. Reach out your hand and put it into my side. Stop doubting and believe."

John 20:27

"But if you can do anything, take pity on us and help us." "If I can?" said Jesus. "Everything is possible for him who believes." Immediately the boy's father exclaimed, "I do believe; help me overcome my unbelief!"

Mark 9:22b-24

Then Jesus answered, "Woman, you have great faith! Your request is granted." And her daughter was healed from that very hour.

Matthew 15:28

Blessed is the man who makes the LORD his trust, who does not look to the proud, to those who turn aside to false gods.

Psalms 40:4

Fear of man will prove to be a snare, but whoever trusts in the LORD is kept safe.

Proverbs 29:25

You will keep in perfect peace him whose mind is steadfast, because he trusts in you. Trust in the LORD forever, for the LORD, the LORD, is the Rock eternal.

Isaiah 26:3-4

In addition to all this, take up the shield of faith, with which you can extinguish all the flaming arrows of the evil one.

Ephesians 6:16

This is what the Sovereign LORD, the Holy One of Israel, says: "In repentance and rest is your salvation, in quietness and trust is your strength..."

Isaiah 30:15a

Do you not know? Have you not heard? The LORD is the everlasting God, the Creator of the ends of the earth. He will not grow tired or weary, and his understanding no one can fathom. Those who hope in the LORD will renew their strength. They will soar on wings like eagles; they will run and not grow weary, they will walk and not be faint.

Isaiah 40:28, 31

He replied, "Because you have so little faith. I tell you the truth, if you have faith as small as a mustard seed, you can say to this mountain, 'Move from here to there' and it will move. Nothing will be impossible for you."

Matthew 17:20

And we know that in all things God works for the good of those who love him, who have been called according to his purpose.

Romans 8:28

Those who know your name will trust in you, for you, LORD, have never forsaken those who seek you.

Psalms 9:10

If any of you lacks wisdom, he should ask God, who gives generously to all without finding fault, and it will be given to him. But when he asks, he must believe and not doubt, because he who doubts is like a wave of the sea, blown and tossed by the wind.

James 1:5-6

Everyone must submit himself to the governing authorities, for there is no authority except that which God has established. The authorities that exist have been established by God. Consequently, he who rebels against the authority is rebelling against what God has instituted, and those who do so will bring judgment on themselves.

Romans 13:1-2

Trust in the LORD with all your heart and lean not on your own understanding; in all your ways acknowledge him, and he will make your paths straight.

Proverbs 3:5-6

Appendix C – Sentences for the Neutral-Prime Condition

Your body is able to get the vitamins it needs from the foods you eat because different foods contain different vitamins. The key is to eat different foods to get an assortment of vitamins.

The student trainer commits to one four-week course, meeting two times per week. Up to three agencies may furnish student trainers to work with one group of dogs. They train on different days. The dogs get up to 6 hours of quality attention each week.

Our passion for design and embrace of new technologies make for a dynamic union of imagery and inspiration.

Our delicious brownies are baked soft and chewy with a fine texture, moist and rich, with the wonderful aroma of pure vanilla extract.

The key is balance between the two extremes. There are many ways to foster positivity in a marriage. Being affectionate, truly listening to each other, taking joy in each other's achievements and being playful are just a few examples of positive interactions that help make marriages successful.

The alternatives are not promoted by the major vendors, for good reason: as we shall see, they are available for free.

Never pour water down the drain when there may be another use for it. Use it to water your indoor plants or garden.

Being glass, the mortar should probably be white. Coverage is critical between the tile and the substrate.

Jenny shrugged. "Before we tell him we should feed him ice cream." Chris laughed. "I think that might be a good idea."

The cushions had long since been removed, and the leather hangings, where they had not crumbled away, dangled in shreds from the worm-eaten frame.

In many cases, sophisticated interchanges allow for smooth, uninterrupted transitions between intersecting freeways and busy arterial roads. However, sometimes it is necessary to exit onto a surface road to transfer from one freeway to another.

Seventy-five percent of Americans admit to littering within the last 5 years, and the most common litter offenders are men between the ages of 18-34.

Norwegian was his first language when he was a little boy.

It is not recommended that these particular settings be rolled out on a production system. Implementing the various security policy modules takes a good deal of thought and testing. One who does not fully understand exactly how everything works may find him or herself going back through the entire system and reconfiguring many files or directories.



Though I wanted to take revenge on them, I also wanted to live up to my name. I was supposed to be a good wolf. So I decided to forget the ugly past and continue to be the pigs' friend. I took off the lion skin then I invited them to my costume party. We had a wonderful time at the party, and I was relieved to have forgotten about my grudge.

### Appendix D – Examples of Strong & Weak Arguments

#### Strong Argument Condition:

##### *Strong Argument #1*

In our search for background information about senior comprehensive exams, we found that the National Scholarship Achievement Board recently revealed the results of a five-year study conducted on the effectiveness of the exams at Duke University. They found that since the exams had been implemented there, the grade point average of undergraduates increased by 31%. At comparable schools that did not implement the exams, grade point averages increased by only 8% over the same five years. The comprehensive exams clearly seem to be effective in causing students to work harder and faculty to teach more effectively. It is highly likely that the benefits observed at Duke would also be observed at other universities that adopt the exam policy.

##### *Strong Argument #2*

Graduate schools and law and medical schools are beginning to show clear and significant preferences for students who received their undergraduate degrees from institutions with comprehensive exams. As the Dean of the Harvard Business School said: "Although Harvard has not and will not discriminate on the basis of race or sex, we do show a strong preference for applicants who have demonstrated their expertise in an area of study by passing a comprehensive exam at the undergraduate level." Admissions officers of law, medical, and graduate schools have also endorsed the comprehensive exam policy and indicated that students at schools without the exams would be at a significant disadvantage in the very near future. Thus, the institution of comprehensive exams will be an aid to those who seek admission to graduate and professional schools after graduation.

##### *Strong Argument #3*

A member of the Board of Curators has stated publicly that alumni nationwide have refused to increase their contributions to the University because of what they feel are lax educational standards. In fact, the prestigious National Accrediting Board of Higher Education (NAB) has recently rejected the University's application for membership citing the lack of a comprehensive exam as a major reason. Accreditation by the NAB enhances a university's reputation to graduate schools, employers, and demonstrates to alumni that the school is worth supporting. A recent survey of influential alumni in corporations and the state legislature has revealed that contributions would improve significantly if the exams were instituted. With increased alumni support, continued increases in tuition might be avoided.

##### *Strong Argument #4*

Additional information about the policy came from two studies conducted by the Educational Testing Service of Princeton, New Jersey. It found that most of the Ivy League schools and several of the Big 10 universities have senior comprehensive exams to maintain their renowned academic excellence. Professors at those schools who were interviewed said that senior exams assured that only high quality and knowledgeable students would be associated with the university. This, of course, increases the prestige and academic reputation of the students (current and alumni), the faculty members, and the university in general.

##### *Strong Argument #5*

The other study by ETS found an important feature of the comprehensive exams. The exams have produced a significant improvement in the quality of undergraduate teaching in the schools where they

has been implemented. The study's data showed that teachers and courses at the schools with this policy were rated more positively after implementation of the exams than before. The improvement in teaching effectiveness appears to be due to departments placing more emphasis on high quality teaching because departments suffer when their majors do poorly on the exam. For example, the University of Florida's students rated courses more highly after the exams were implemented.

*Strong Argument #6*

One aspect of the comprehensive exam requirement that students at the schools where it has been tried seem to like is that all regular final examinations for seniors are typically eliminated. This elimination of final exams in all courses for seniors allows them to better integrate and think about the material in their major area just prior to graduation rather than "wasting" a lot of time cramming to pass tests in courses in which they are really not interested. Students presently have to take too many courses in subjects that are irrelevant to their career plans. The comprehensive exam places somewhat greater emphasis on the student's major and allows greater concentration on the material that the student feels is most relevant.

*Strong Argument #7*

Faculty members at universities with the comprehensive exams who were interviewed by researchers from the Carnegie Commission on Higher Education revealed that the comprehensive exams appeared to provide an incentive for students to study the material in their major area. A thorough study undertaken by the Department of Education at the University of Notre Dame showed that universities with comprehensive exams have resisted the national trend of declining scores on standardized achievement tests. Average scores on achievement tests for the universities with comprehensive exams have actually risen over the last five years.

*Strong Argument #8*

One interesting and important fringe benefit of the exams is that the average starting salary of graduates increased by over \$4000 during the two-year period in which the exams have begun to be used at the University of Virginia. At a comparable university without the exams, salaries increased by only \$850 over the two-year period. Saul Siegel, a vice president of IBM, was quoted in Business Week as saying, "We are much quicker to offer the large salaries and executive positions to these kids because by passing their area exam, they have proven to us that they have expertise in their field rather than being people who may or may not be dependable and reliable." The exams could help attract larger and better known corporations to their campuses to recruit students. The students would have a greater chance at landing a good job than students at schools that have not implemented the policy.

*Strong Argument #9*

A study by the U.S. Department of Education revealed that universities with the comprehensive exam requirement average about 32% more financial aid available to students than comparable universities without exams. Richard Collings, Director of Financial Aid at the University of Southern California (USC) has written that since the comprehensive exam was instituted at USC five years ago, more individuals and corporations have been willing to donate money for student scholarships.

Weak Argument Condition:*Weak Argument #1*

In our search for background information about senior comprehensive exams, we found that the National Scholarship Achievement Board recently revealed the results of a five-year study conducted on the effectiveness of the exams at Duke University. They found that since the exams had been implemented there, students' anxiety levels had increased by 31%. At comparable schools that did not implement the exams, anxiety levels increased by only 8% over the same five years. The comprehensive exams clearly seem to be effective since increasing anxiety would motivate students to study more for their courses due to fear of failure. It is highly likely that the benefits observed at Duke would also be observed at other universities that adopt the exam policy.

*Weak Argument #2*

Graduate students have always had to take a comprehensive exam in their major area before receiving their degrees, and it is only fair that undergraduates should have to take them also. As the Dean of the Harvard Business School said, "If a comprehensive exam is considered necessary to demonstrate competence for a masters or doctoral degree, by what logic is it excluded as a requirement for the bachelor's degree? What administrators don't realize is that this is discrimination just like discrimination against Blacks or Jews. There would be a lot of trouble if universities required only Whites to take comprehensive exams but not Blacks. Yet universities all over the country are getting away with the same thing by requiring graduate students but not undergraduates to take the exams." Thus the institution of comprehensive exams could be as useful for undergraduates as they have been for graduate students.

*Weak Argument #3*

A member of the Board of Curators has stated publicly that his brother had to take a comprehensive exam while in college and now he is manager of a large restaurant. He indicated that he realized the value of the exams since their father was a migrant worker who didn't even finish high school. He also indicated that the university has received several letters from parents in support of the exam. In fact, 4 of the 6 parents who wrote in thought that the exams were an excellent idea. Also, the prestigious National Accrediting Board of Higher Education seeks input from parents as well as students, faculty, and administrators when evaluating a university. Since most parents contribute financially to their child's education and also favor the exams, the university should institute them. This would show that the university is willing to listen to and follow the parents' wishes over those of students and faculty who may simply fear the work involved in comprehensive exams.

*Weak Argument #4*

Additional information about the policy came from a study conducted by the Educational Testing Service of Princeton, New Jersey. It found that many schools are considering adopting this policy. Thus, schools that implement the comprehensive exams would be at the forefront of a national trend. Some professors at schools with the exams who were interviewed felt that high school students were impressed by a university that kept pace with current trends. In fact, whether a school offered comprehensive exams might be the deciding factor in choosing a college.

*Weak Argument #5*

An interesting and important fringe benefit of this policy is that if it were implemented nationwide, students would be able to compare their achievements with the achievements of students at other universities. For example, it is exciting to imagine that students at UH would be able to compare their scores with students at Florida State University. The possibility for comparison would provide an incentive for students to study and pass the exams so they would not be embarrassed when comparing their scores to their friends' scores.

*Weak Argument #6*

One feature of the comprehensive exam requirement that students at the schools where it has been tried seem to like is that passing the exams provides a very difficult challenge. For example, many students want jobs in business when they graduate and the corporate world is very tough. Yet, most students' lives are filled with few challenges whatsoever. Everything has been provided for them since the day they were born. It's not that students are not grateful, but knowing that they had to pass a difficult exam before they graduated would prepare them for the hard and cold realities of life. Students would be nervous about passing the exam and fear that if they did not pass and graduate, four years of time would be wasted. However, that is what life is all about--taking risks and overcoming them. Having to pass a comprehensive exam is a challenge most students would welcome.

*Weak Argument #7*

Faculty members at universities with the comprehensive exams who were interviewed by researchers from the Carnegie Commission on Higher Education revealed that they liked the exams because they reduced the number of tests they felt they had to give in their classes knowing that students would still face one ultimate test of their knowledge in the comprehensive exam. A study in Notre Dame showed that this reduction in regular course tests saved enough paper to cover the cost of painting two classrooms.

*Weak Argument #8*

A study at the University of Virginia found that most students enjoy the senior comprehensive exams. Over 55% of one faculty member's students commented favorably on this policy, which was recently implemented there. One student, Saul Siegel, whose father is a vice president of IBM, was quoted in the school newspaper as saying, "The history of exams of this type can be traced to the ancient Greeks. If comprehensive exams are instituted at other schools, the students could feel pleasure in following traditions begun by Plato and Aristotle. Even if there were no other benefits, it should be worth it just to follow tradition."

*Weak Argument #9*

In a study the U.S. Department of Education revealed that several national testing companies were developing senior comprehensive exams for use by universities in the U.S. The tests would be similar to the SAT and ACT tests which currently generate millions of dollars for the companies that make them. Richard Collings, a former Director of Financial Aid at the University of Southern California who now works for the Educational testing service, wrote recently in *Business Week*: "At ETS, we are not pushing comprehensive exams simply because of the huge amount of money involved. We are genuinely interested in marketing a good product. Just as our SAT and GRE tests are used to determine who is qualified for college and graduate work, so too should our comprehensive exams be used to determine who should graduate from college. We expect to have 32% of the market in 5 years."

### Appendix E – Argument Quality Essays

#### Strong Arguments Essay

In our search for background information about senior comprehensive exams, we found that the National Scholarship Achievement Board recently revealed the results of a five-year study conducted on the effectiveness of the exams at Duke University. They found that since the exams had been implemented there, the grade point average of undergraduates increased by 31%. At comparable schools that did not implement the exams, grade point averages increased by only 8% over the same five years. The comprehensive exams clearly seem to be effective in causing students to work harder and faculty to teach more effectively. It is highly likely that the benefits observed at Duke would also be observed at other universities that adopt the exam policy.

One major aspect of the comprehensive exam requirement that students (at the schools where it has been tried) seem to like is that all regular final examinations for seniors are typically eliminated. This elimination of final exams in all courses for seniors allows them to better integrate and think about the material in their major area just prior to graduation rather than "wasting" a lot of time cramming to pass tests in courses in which they are really not interested. Students presently have to take too many courses in subjects that are irrelevant to their career plans. The comprehensive exam places somewhat greater emphasis on the student's major and allows greater concentration on the material that the student feels is most relevant.

In a study by the U.S. Department of Education, it was found that universities with the comprehensive exam requirement average about 32% more financial aid available to students than comparable universities without exams. Richard Collings, Director of Financial Aid at the University of Southern California (USC) has written that since the comprehensive exam was instituted at USC five years ago, more individuals and corporations have been willing to donate money for student scholarships.

Another interesting and important fringe benefit of the exams is that the average starting salary of graduates increased by over \$4000 during the two-year period in which the exams have begun to be used at the University of Virginia. At a comparable university without the exams, salaries increased by only \$850 over the two-year period. Saul Siegel, a vice president of IBM, was quoted in Business Week as saying, "We are much quicker to offer the large salaries and executive positions to these kids because by passing their area exam, they have proven to us that they have expertise in their field rather than being people who may or may not be dependable and reliable." The exams could help attract larger and better known corporations to their campuses to recruit students. The students would have a greater chance at landing a good job than students at schools that have not implemented the policy.

#### Weak Arguments Essay

One feature of the comprehensive exam requirement that students (at the schools where it has been tried) seem to like is that passing the exams provides a very difficult challenge. For example, many students want jobs in business when they graduate and the corporate world is very tough. Yet, most students' lives are filled with few challenges whatsoever. Everything has been provided for them since the day they were born. It's not that students are not grateful, but knowing that they had to pass a difficult exam before they graduated would prepare them for the hard and cold realities of life.

Students would be nervous about passing the exam and fear that if they did not pass and graduate, four years of time would be wasted. However, that is what life is all about--taking risks and overcoming them. Having to pass a comprehensive exam is a challenge most students would welcome.

A study at the University of Virginia found that most students enjoy the senior comprehensive exams. Over 55% of one faculty member's students commented favorably on this policy, which was recently implemented there. One student, Saul Siegel, whose father is a vice president of IBM, was quoted in the school newspaper as saying, "The history of exams of this type can be traced to the ancient Greeks. If comprehensive exams are instituted at other schools, the students could feel pleasure in following traditions begun by Plato and Aristotle. Even if there were no other benefits, it should be worth it just to follow tradition."

When faculty members at universities with the comprehensive exams were interviewed by researchers from the Carnegie Commission on Higher Education, they stated that they liked the exams because they reduced the number of tests they felt they had to give in their classes knowing that students would still face one ultimate test of their knowledge in the comprehensive exam. A study in Notre Dame showed that this reduction in regular course tests saved enough paper to cover the cost of painting two classrooms.

A member of the Board of Curators has stated publicly that his brother had to take a comprehensive exam while in college and now he is manager of a large restaurant. He indicated that he realized the value of the exams since their father was a migrant worker who didn't even finish high school. He also indicated that the university has received several letters from parents in support of the exam. In fact, 4 of the 6 parents who wrote in thought that the exams were an excellent idea. Also, the prestigious National Accrediting Board of Higher Education seeks input from parents as well as students, faculty, and administrators when evaluating a university. Since most parents contribute financially to their child's education and also favor the exams, the university should institute them. This would show that the university is willing to listen to and follow the parents' wishes over those of students and faculty who may simply fear the work involved in comprehensive exams.

Appendix F – Essay Instructions & Relevance ManipulationsHigh Relevance:

Please read the following essay regarding the implementation of senior comprehensive exams.

The University of Houston is currently considering implementing these exams next year.

Low Relevance:

Please read the following essay regarding the implementation of senior comprehensive exams.

While other universities have implemented these exams, the University of Houston is not currently considering doing so.



Appendix G – Attitude Questions

Generally speaking, what is your opinion on the implementation of senior comprehensive exams?

1 = strongly oppose

2

3

4

5

6

7 = strongly favor

Please rate how you feel about the implementation of senior comprehensive exams on the scales below.

1 = foolish

2

3

4

5

6

7 = wise

1 = harmful

2

3

4

5

6

7 = beneficial

1 = negative

2

3

4

5

6

7 = positive

1 = bad

2

3

4

5

6

7 = good

1 = unfavorable

2

3

4

5

6

7 = favorable

1 = undesirable

2

3

4

5

6

7 = desirable

1 = dislike

2

3

4

5

6

7 = like

How would you rate the personal importance of the message?

1 = very unimportant to me personally

2

3

4

5

6

7 = very important to me personally

How would you rate the quality of the arguments that you read in the message?

1 = very weak

2

3

4

5

6

7 = very strong

Appendix H – Thought Listing Instructions  
(slightly modified from Petty & Cacioppo, 1986)

We are now interested in what you were thinking while you read the student essay about comprehensive exams. You might have had ideas all favorable to implementing the exams, all opposed, all irrelevant to comprehensive exams, or a mixture of the three. Any case is fine; simply list what it was that you were thinking while you read the essay. The next screen will contain the form we have prepared for you to use to record your thoughts and ideas. Simply write down the first idea you had in the first box, the second idea in the second box, etc. Please put only one idea or thought in a box. You should try to record only those ideas that you were thinking *during* the message. Please state your thoughts and ideas as concisely as possible...a phrase is sufficient. IGNORE SPELLING, GRAMMAR, AND PUNCTUATION. We have deliberately provided more space than we think most people will need to insure that everyone will have plenty of room to write the ideas they had during the message. So don't worry if you don't fill every space. Just write down whatever your thoughts were during the message. Please be completely honest and list all of the thoughts you had.

Appendix I – Intrinsic/Extrinsic Motivation Scale  
(Hoge, 1972)

(E) = extrinsic item

(I) = intrinsic item

1. Church is important as a place to go for comfort and refuge from the trials and problems of life. (E)
2. If I were to join a church group, I would prefer to join a Bible study group rather than a social fellowship. (I)
3. My faith involves all of my life. (I)
4. Sunday morning can often be spent more profitably than in regular churchgoing. (E)
5. One should seek God's guidance when making every important decision. (I)
6. In my life I experience the presence of the Divine. (I)
7. If I have the opportunity to explain my beliefs to a non-Christian group, I do it. (I)
8. Prayer influences my dealings with other people. (I)
9. What religion offers most is comfort when sorrow and misfortune strike. (E)
10. Religion helps to keep my life balanced and steady in exactly the same way as my citizenship, friendships, and other memberships do. (E)
11. My faith sometimes restricts my actions. (I)
12. Nothing is as important to me as serving God as best as I know how. (I)
13. I try hard to carry my religion over into all my other dealings in life. (I)
14. My religious beliefs are what really lie behind my whole approach to life. (I)
15. One reason for my being a church member is that such membership helps to establish a person in the community. (E)
16. The purpose of prayer is to secure a happy and peaceful life. (E)
17. The church is most important as a place to formulate good social relationships. (E)
18. The prayers I say when I am alone carry as much meaning and personal emotion as those said by me during services. (I)
19. It is important to me to spend periods of time in private religious thought and meditation. (I)
20. The primary purpose of prayer is to gain relief and protection. (E)
21. It doesn't matter so much what I believe as long as I lead a moral life. (E)
22. Quite often I have been keenly aware of the presence of God or of the Diving Being. (I)
23. Although I am a religious person, I refuse to let religious considerations influence my everyday affairs. (E)
24. Although I believe in my religion, I feel there are many more important things in life. (E)
25. I pray chiefly because I have been taught to pray. (E)
26. Religion is especially important to me because it answers many questions about the meaning of life. (I)
27. A primary reason for my interest in religion is that my church is a congenial social activity. (E)
28. Occasionally I find it necessary to compromise my religious beliefs in order to protect my social and economic well-being. (E)
29. If not prevented by unavoidable circumstances, I attend church: (I)
  - At least once a week or more
  - Two or three times a month
  - Once every month or two

- Rarely
30. I read literature about my faith (or church): (I)
- Frequently
- Occasionally
- Rarely
- Never

Appendix J – Interpersonal Trust Scale  
(Rotter, 1967)

1. Hypocrisy is on the increase in our society.
2. In dealing with strangers, one is better off to be cautious until they have provided evidence that they are trustworthy.
3. This country has a dark future unless we can attract better people into politics.
4. Fear and social disgrace or punishment rather than conscience prevents most people from breaking the law.
5. Using the honor system of *not* having a teacher present during exams would probably result in increased cheating.
6. Parents usually can be relied on to keep their promises.
7. The United Nations will never be an effective force in keeping world peace.
8. The judiciary is a place where we can all get unbiased treatment.
9. Most people would be horrified if they knew how much news that the public hears and sees is distorted.
10. It is safe to believe that in spite of what people say, most people are primarily interested in their own welfare.
11. Even though we have reports in newspapers, radio, and T.V., it is hard to get objective accounts of public events.
12. The future seems very promising.
13. If we really knew what was going on in international politics, the public would have reason to be more frightened than they now seem to be.
14. Most elected officials are really sincere in their campaign promises.
15. Many major national sports contests are fixed in one way or another.
16. Most experts can be relied upon to tell the truth about the limits of their knowledge.
17. Most parents can be relied upon to carry out their threats of punishments.
18. Most people can be counted on to do what they say they will do.
19. In these competitive times one has to be alert or someone is likely to take advantage of you.
20. Most idealists are sincere and usually practice what they preach.
21. Most salesmen are honest in describing their products.
22. Most students in school would *not* cheat even if they were sure of getting away with it.
23. Most repairmen will not overcharge even if they think you are ignorant of their specialty.
24. A large share of accident claims filed against insurance companies are phony.
25. Most people answer public opinion polls honestly.

Participants were given the following response scale after each item listed above:

- 1 = Strongly agree
- 2 = Mildly agree
- 3 = Agree and disagree equally
- 4 = Mildly disagree
- 5 = Strongly disagree

Appendix K – Harmony Control Scale  
(Morling & Fiske, 1999)

1. Sometimes when I am with others, I become fully absorbed in what they do.
2. I accept the present because I know it's the will of some higher power.
3. I know that a higher power will arrange for my ultimate well-being.
4. Periods of good and bad luck even out in the end.
5. Sometimes when I am with others, I seem to lose track of what I personally want.
6. I feel secure knowing my friends will take care of me, should I need it.
7. I don't feel that there is a particular path laid out for me.
8. I get along well with people because I usually know what they will do.
9. I do not trust other people to make important decisions for me.
10. There is no use fighting one's fate.
11. To lose well is to win.
12. It's not that important for me to know that others will support me.
13. Most of my own needs are met when I meet other people's needs.
14. I don't mind bad times because good times will ultimately follow.
15. Getting along with others is easier when I try to anticipate what they want or need.
16. I can rely on other people to help me fulfill my needs.
17. Some higher power ultimately decides the good and bad times in our lives.
18. I do not believe that our lives are guided by a higher power.
19. With other people looking out for me, I know I will never "hit bottom."
20. I do not usually find that anticipating other people's goals and actions helps me get along better.
21. When I have a streak of bad luck, I wait for my luck to change.

Participants were given the following response scale after each item listed above:

- 1 = Strongly disagree  
2  
3  
4  
5  
6  
7 = Strongly agree

Appendix L – The Dogmatism Scale  
(Altemeyer, 2002)

*Note.* The first two statements (X and Y) are not scored. They familiarize the respondent with the content to follow, but they may be omitted. (R) indicates that the item is worded in the ‘undogmatic’ direction, for which the scoring key is reversed. Items are answered in a range of –4 to +4 and converted to 1 to 9 (5 = *neutral*) – see below for response scale given.

X. I may be wrong about some of the little things in life, but I am quite certain I am right about all the BIG issues.

Y. Someday I will probably think that many of my present ideas were wrong.

1. Anyone who is honestly and truly seeking the truth will end up believing what I believe.
2. There are so many things we have not discovered yet, nobody should be absolutely certain his beliefs are right. (R)
3. The things I believe in are so completely true, I could never doubt them.
4. I have never discovered a system of beliefs that explains everything to my satisfaction. (R)
5. It is best to be open to all possibilities and ready to reevaluate all your beliefs. (R)
6. My opinions are right and will stand the test of time.
7. Flexibility is a real virtue in thinking, since you may well be wrong. (R)
8. My opinions and beliefs fit together perfectly to make a crystal-clear “picture” of things.
9. There are no discoveries or facts that could possibly make me change my mind about the things that matter most in life.
10. I am a long way from reaching final conclusions about the central issues in life. (R)
11. The person who is absolutely certain she has the truth will probably never find it. (R)
12. I am absolutely certain that my ideas about the fundamental issues in life are correct.
13. The people who disagree with me may well turn out to be right. (R)
14. I am so sure I am right about the important things in life; there is no evidence that could convince me otherwise.
15. If you are “open-minded” about the most important things in life, you will probably reach the wrong conclusions.
16. Twenty years from now, some of my opinions about the important things in life will probably have changed. (R)
17. “Flexibility in thinking” is another name for being “wishy-washy.”
18. No one knows all the essential truths about the central issues in life. (R)
19. Someday I will probably realize my present ideas about the BIG issues are wrong. (R)
20. People who disagree with me are just plain wrong and often evil as well.

Participants were given the following response scale after each item listed above:

-4 = Strongly disagree

-3

-2

-1

0 = Neutral

1

2

3

4 = Strongly agree



Appendix M – The PANAS Scale – State Version

This scale consists of a number of words that describe different feelings and emotions. Read each item and then click on the appropriate answer. Indicate to what extent you currently feel this way.

1. Interested
2. Irritable
3. Distressed
4. Alert
5. Excited
6. Ashamed
7. Upset
8. Inspired
9. Strong
10. Nervous
11. Guilty
12. Determined
13. Scared
14. Attentive
15. Hostile
16. Jittery
17. Enthusiastic
18. Active
19. Proud
20. Afraid

Participants were given the following response scale:

- 1 = Very slightly or not at all
- 2 = A little
- 3 = Moderately
- 4 = Quite a bit
- 5 = Extremely

Appendix N – Prime x Interpersonal Trust Interaction on Attitudes