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The Automatic Consequences of Religious Priming

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Abstract

Religion underlies the way that many people perceive the world, but little is understood concerning how individuals mentally process religious representations. The present work applies automaticity research to the domain of religious representations. Two pilot studies suggested that being primed with religious words led to the automatic activation of religious representations and corresponding behavior. Dijksterhuis and Bargh (2001) recently theorized that individuals demonstrate automatic behaviors because of the social advantages of assimilating to the environment. Therefore, regardless of one's religiosity, being primed with religious words may motivate one to conform to the perceived intents and goals of religious people. The current thesis further examined this social assimilation motivation hypothesis. It was predicted that an underlying social assimilation process accounted for previously found automatic behavioral effects of religious priming in a task that misled people to cheat. Results showed that participants did indeed cheat more when primed with concrete as opposed to general religious words. Contrary to predictions, however, the suggested contrast found in the concrete religious word group did not differ when participants' cognitive capacity was manipulated. Overall, these mixed results suggest an assimilation process in religious priming. Future research is discussed that may offer better tests of the role cognitive processing plays in religious social perception and behavior.

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To the Graduate School:

This thesis, entitled "The Automatic Consequences of Religious Priming," and written by Brandon Randolph-Seng is presented to the College of Graduate Studies of Georgia Southern University. I recommend that it be accepted in partial fulfillment of the requirements for the Degree of Master of Science in Psychology.

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Chapter I

Introduction

Religion underlies the way that many people perceive the world, but little is understood concerning how individuals mental process religious representations. This stems from a lack of research applying cognitive psychology to the psychological study of religion. Some researchers have recognized this gap and applied schema-based approaches to religious representations (e.g., McIntosh, 1995). Schema theories provide a valuable descriptive foundation but do not explain specific cognitive processes. To understand such processes researchers are turning to cognitive processing models, which show that individuals process certain types of information automatically, and that such processing can affect behavior on a nonconscious level (e.g., Djiksterhuis & Bargh, 2001). The current thesis applies the cognitive processing model to religious representations in order to examine if such representations can be expressed in an automatic fashion.

Religion-As-Schema

A schema is a stable, organized mental representation containing past knowledge in a certain domain. Schemas are developed from encounters with the environment and may be modified by experience. Schemas can operate at many different levels of generality (Fiske & Linville, 1980). Much work has been done regarding how best to conceptualize the influence of cognitive generalizations of the self or self-schemata since the time Markus (1977) first introduced the idea. The progression of this work can be seen by Markus' later pursuit of applying impression formation, attribution, person perception, and projection to the function of the self-schemata (Markus, Smith, & Moreland, 1985).

Researchers have begun to apply a religion-as-schema concept to the psychological study of religion. This approach has been helpful in integrating previous findings, understanding how religious beliefs are organized, and describing how these beliefs influence individuals' perceptions and interpretations of events (McIntosh, 1995). However, the structure provided by religion-as-schema models is not consistently associated with such religiously-laden cognitions as planning for death (Ladd et al., 1998). This finding is at odds with the view that schemas are semantic organizing systems and it illustrates a limitation of schema-based theories: The way that specific cognitive processes are integrated is difficult to discover because such processes can only be described.

Automatic Cognitive Processes

Early research in automaticity revealed two basic types of cognitive processes: Controlled and automatic (Schneider & Shiffrin, 1977). Controlled processes were characterized by conscious, effortful processing. Automatic processes were characterized by nonconscious, effortless processing. Research since the 1960s in areas such as stereotyping, attitudes, and attribution, increasingly reveals automatic rather than conscious processing (Bargh, 1996; Bargh, 1997; Devine, 1989; for a review see Wegner & Bargh, 1998).

Automatic thought processes, by definition, are reflexive responses to certain triggering conditions. These thought processes include both preconscious (chronic) and post-conscious (temporary) processes. Preconscious processes require only that a stimulus event or object be detected by an individual's sensory system before conscious awareness of the stimulus. Once that triggering event is detected, the process runs to completion without awareness. Preconscious processes create the individual's immediate psychological situation from which conscious responses are formed (Bargh, 1997).

Postconscious processes on the other hand require both the presence of a stimulus event or object, and its recent activation or use. When a construct has been recently activated or is currently active, the postconscious and preconscious effects are indistinguishable. Postconscious processes are typically studied using an experimental technique called priming, while preconscious processes generally occur naturally (Bargh, 1997).

Automaticity in Social Psychology

Social judgment is one of the areas in which automatic processing has been demonstrated in social psychology. For example, Devine (1989), found that activation of personal beliefs requires conscious attention, while stereotypes themselves are automatically activated. Without conscious attention, stereotypical judgments appeared by default from an individual who normally does not express prejudice. Stated more generally, judgments are often based on automatically provided sources of input such as stereotypes (Wegner & Bargh, 1998).

A related area of research concerns implicit (i.e., automatically activated) evaluations; for example, Fazio, Sambonmatsu, Powell, and Kardes (1986) showed that the mere presence of an evaluative object is all that is needed to activate the connected evaluation. These researchers presented the names of the evaluative objects as prime words, followed by a target adjective to which the participants responded. Participants responded to this target adjective as quickly as they could by pressing a button labeled either "good" or "bad". In this way, the strength of the evaluation was defined by how fast the participants responded to each of the target adjectives. They found that implicit effects did indeed occur for the participants' strongest evaluations. However, these kinds of automatic effects occur not only for participants' strongest prior evaluations toward an object, but across all evaluative objects (Bargh, Chaiken, Raymond, & Hymes, 1996). For example, Bargh and his colleagues had participants pronounce the target words instead of evaluating them, and removed other evaluative aspects of the paradigm that were found in past studies like Fazio et al. (1986). They found implicit effects for the strongest as well as the weakest evaluations.

Religion-As-Cognitive Process

Researchers have begun to examine how general, orienting representation (e.g., religious representations) might become automatic. For example, using a method designed to measure implicit evaluations, Hill (1994) found that religious and nonreligious people made similar implicit evaluations towards religiously neutral objects. In contrast, implicit evaluations of religious objects were stronger among religious people than among nonreligious people.

A similar line of reasoning has been applied to studying the automaticity of "just world" beliefs. Just world beliefs are similar to religious beliefs, in that both are general beliefs that shade the way the individual interprets a wide variety of situations. Consistent with Hill (1994), participant's just world beliefs can indeed be automatically activated following a subliminal priming procedure (Murray, Spadafore, & McIntosh, 2001).

Automaticity Methods

Automaticity research lends itself to the use of many priming techniques. These methods are necessary because they allow the experimenter to discover and manipulate processes that would otherwise be too uncontrollable and quick to study. Priming produces a brief activation of, and accessibility to, a representation. This momentary activation is similar to long-term automatic processes. Thus, priming allows an experimenter to manipulate persistent automatic effects. This is enhanced by using cognitive load techniques, which keep the controlled mental processes occupied while illuminating the more automatic processes (Bargh & Chartrand, 2000).

Conceptual priming, the activation of a cognitive representation in one context in order to nonconsciously influence an unrelated context, may be either supraliminal (conscious) or subliminal (nonconscious). In supraliminal priming participants receive the priming stimuli in a conscious task they are asked to perform, whereas in subliminal priming the participants receive a prime flashed just outside of conscious awareness (Bargh & Chartrand, 2000).

Priming is executed in several different ways. A good example of supraliminal priming is provided by Bargh, Chen, and Burrows (1996). In their study, participants were given a "scrambled sentence test"

(Srull & Wyer, 1979). Participants were told that the task had to do with language ability and required them to make grammatically correct sentences out of the string of words given. In this way the participants were exposed to words related to the concept being primed.

In a subliminal priming procedure, individuals have no knowledge of the priming stimuli because they are presented in a way that makes conscious awareness difficult (Chartrand, 2000). For example, Devine (1989) had participants identify as quickly and accurately as possible whether flashes – which were actually either stereotype-related words or neutral words – were presented to the left or right of a dot in the center of a computer screen. Results using these methods show that people process information that can automatically influence their immediate responses to the environment (e.g., Bargh et al., 1996).

Instead of producing a brief activation of a mental representation, cognitive load techniques keep mental control processes occupied in order to uncover automatic processes. Cognitive loads are normally generated methodologically by a dual-task paradigm (Bargh & Chartrand, 2000). For example, Martin, Seta, and Crelica (1990, Experiment 1) instructed participants to form an impression of a person either with no distraction or while listening to a voice recite a random string of letters and digits. While doing this, they also were to mentally record the number of digits spoken. As the above studies illustrate, through priming and by manipulating cognitive load, researchers can gain insight into the processes that govern aspects of mental representations.

Behavioral Measures

Our understanding of the cognitive basis of individuals' religious representations may be advanced by combining priming research with a behavioral measure to infer such cognitive processes. Social behavior itself can be primed automatically by the same manipulations that influence such things as impression formation and social judgment (Bargh, 1996). For example, Bargh et al. (1996) used a scrambled sentence test to prime some participants with the concept of the elderly and found that these participants subsequently walked slower than did control participants.

A wide variety of behavioral measures have been used in automaticity research, ranging from participants' walking speed (e.g., Bargh et al., 1996) to scores on general-knowledge tests (e.g., Dijksterhuis, et al., 1998). When applied to religious representations, an inducement to lie becomes a relevant behavioral measure because of the almost universal religious injunction against lying (Kinnier, Kernes, & Dautheribes, 2000). Researchers have used many methods to induce lying, ranging from having participants pretend they are lying (Leonard, 1996) to elaborate means of creating a favorable situation for participants to lie (e.g., Freedman, Wallington, & Bless, 1967; Houston, 1976; Kelly & Worell, 1978).Bruggeman and Hart (1996) used Hartshorne and May's (1928) circle task to measure cheating behavior. This task requires participants to write specific numbers in small circles while alone in a room with their eyes closed. Participants were induced to cheat by being provided with unrealistic expectations on performance and additional extra credit for high performance.

Using the circle task to measure cheating offers a direct way to assess the influence of religious priming on an individual. By priming people with either religious or non-religious words, and then immediately giving them a chance to cheat in an unrelated task, the automatic effects of such priming may be uncovered. Indeed, it would seem to provide a way to understand how religious representations are being cognitively processed. Two pilot studies tested whether primed religious representations can have an automatic influence on cheating behavior (Pilot Study 1) regardless of prior religious belief (Pilot Study 2).[1]

Pilot Study 1

Following Bargh's approach (Bargh et al., 1996; Chartrand & Bargh, 1996) Pilot Study 1 used scrambled sentence tests to prime religious words. The prime was followed by a variation of Hartshorne and May's (1928) classic circle task. It was predicted that individuals who were primed with religious words would cheat less on the circle task than those primed with other words.

One of three scrambled sentence tests (religious, sports-related, or neutral) was randomly assigned to each of the participants, after which they received the same circle task used in Leming's (1978, 1980) and Bruggeman and Hart's (1996) research on cheating. The cheating task was scored using Leming's (1978) criteria. Leming established a baseline for the circle test by determining the mean score of college students with no opportunity to cheat and then used three-standard deviations above this mean to represent the upper limit of an honest response. Using this criterion a significant difference was observed when comparing the religious primed group to the sports and neutral primed groups, with cheating by 44% of the neutral priming group, 50% of the sports priming group, and 0% of the religious priming group.

The findings strongly suggest that the religious scrambled sentences influenced participants to be more honest. This provides the first known demonstration of religious representations automatically influencing behavior. The current results suggest that motivational representations are being primed because features of the environment seem to be activating the goals associated with them without a need for shared semantics (i.e., religious words not honesty words were used as primes; see Bargh, 1990). The behavioral consequence of the primes supports research on social category priming (e.g., Dijksterhuis & Bargh, 2001) and is consistent with research showing that social categories can influence individuals without awareness (e.g., Kawakami, Dovidio, and Dijksterhuis, 2003). Therefore, it may be that the religious words automatically activate participant's stereotypical knowledge of religious people's goals. However, because Pilot Study 1 did not include a measure of participant's religiousness, an alternate interpretation is possible: priming participants with religious words might automatically activate their own religious beliefs rather than a stereotypical knowledge of religious peoples' goals (e.g., Hill, 1994).[3] In other words, individual's preconscious automatic tendencies may interact with the postconscious effects produced from priming. For example, a person with strong religious beliefs may be more likely to use these motivations to guide their behavior when they are made salient as opposed to when they are not. Further, despite participants reporting no conscious awareness of the primes, it is not possible to rule out the involvement of conscious mental processes because a supraliminal priming task was used. To remedy these problems a second pilot study was performed.

Pilot Study 2

The problem of distinguishing between motivational mechanisms for priming effects has been the focus of a series of studies by Bargh and colleagues. They found, for example, that only men who have a tendency to sexually aggress, and who have been primed with the concept of power, rate the same women to be more attractive than when they had not been primed (Bargh, Raymond, Pryor, & Strack, 1995). Other chronic motivational variables such as need for achievement and self-monitoring have shown similar results (see Bargh & Barndollar, 1996). Thus, chronic motivations can result in different reactions depending on the prime used.

Extending this notion to the area of religion one must consider intrinsic religious orientation, as originally conceived by Allport and Ross (1967). Individuals with an intrinsic religious orientation understand all of life by their religion (Donahue, 1985). In this vein, if the religious primes are automatically activating a personal religious belief and corresponding behavior, then individuals with a highly intrinsic orientation should be more likely to be honest on the circle task (e.g., Hill, 1994). However, if the religious primes are automatically activating a stereotypical representation of religious people's goals (as predicted above), then the level of intrinsic religiosity should not matter; only the prime that is received should affect honesty (e.g., Bargh et al., 1996).

Pilot Study 2 featured a direct test of the effects of religious representations on automatic behavior by using a subliminal priming procedure to rule out possible awareness of the prime. The priming task was followed by the same circle task used in Pilot Study 1, which was followed by a filler task and measurement of participants' religious orientation using Gorsuch and McPherson's (1989) Intrinsic / Extrinsic - Revised Scale (I/E-R).

Using Leming's (1978) criteria as in Pilot Study 1, 10.2% of the participants were classified as cheaters in Pilot Study 2. Consistent with past research (see Bargh & Chartrand, 2000), the subliminal presentations did not have as strong of an effect as the supraliminal presentations did in Pilot Study 1. Nevertheless, further analyses once again revealed a significant difference in the rates at which participants cheated, with none of the participants in the religious priming condition being classified as cheaters and 20% of participants in the control condition being classified as cheaters, replicating the pattern found in Pilot Study 1. Further analyses found that only the priming measure was significantly predictive of cheating; neither religious orientation, nor its interaction with the prime, predicted cheating behavior.

Where Pilot Study 1 showed that priming people with religious words affected their behavior, Pilot Study 2 provided further support by replicating the results with a subliminal, rather than supraliminal priming procedure. Further, Pilot Study 2 extended the results of Pilot Study 1 by providing more direct evidence that religious primes seem to automatically activate a stereotypical representation of religious people rather than one's personal religious beliefs.

The Present Study

As supported by Pilot Studies 1 and 2, Dijksterhuis and Bargh (2001) theorized that individuals demonstrate automatic behaviors because of the advantages of conforming to the social environment. However, neither pilot study fully addressed the possibility of automatic social assimilation explaining the effects of the religious prime on participants' behavior. The current thesis attempts to more fully address this issue.

Dijksterhuis and Bargh (2001) state that the tendency to imitate others comes about because perception automatically evokes corresponding behavior. The only real precondition of imitation is the perception of the behavior (Chartrand & Bargh, 1999). According to Bargh's (1990) auto-motive model, a possible route to behavioral intention can be via the perceived intents and goals of the people one is interacting with in the situation. If religious priming motivates one to conform to the perceived intents and goals of a religious person, then the perceived person who is the object of those motivations should matter. For example, Bargh et al. (1996) found that priming college participants with an elderly stereotype prompted them to walk slower, whereas Dijksterhuis et al. (1998) found priming college participants with a specific elderly exemplar (the Dutch Queen Mother) led them to walk faster. Thus, more abstract stimuli led to assimilation, while more concrete stimuli led to contrast. Therefore if an underlying social assimilation process is at work, it should be possible to show contrast effects in automatic behavior similar to Dijksterhuis et al.'s (1998) findings. If it can be shown that religious primes can automatically contrast behavior, then it would mean that even general, orienting representations can act in ways similar to stereotypes in social perception and behavior.

Hypotheses

1) It is predicted that participants (regardless of religiosity) who are primed with general religious words (e.g., faith, worship, salvation) will have a low occurrence of cheating, replicating the assimilation effects found in Pilot Studies 1 and 2. Yet when participants are primed with specific concrete religious words (e.g., Noah, Moses, Christ) it is predicted that they will cheat significantly more than participants primed with general religious words – showing a contrast effect.

2) To further demonstrate automatic assimilation and contrast in the predicted behavioral response, a cognitive load procedure similar to Dijksterhuis et al. (2001, Experiment 2) is used. These researchers showed that an impression of a concrete stimulus (a specific elderly person) led people to walk faster (contrast), whereas under a cognitive load, an impression of a concrete stimulus led people to walk more slowly (assimilation). Therefore, it is predicted that under a cognitive load, specific concrete religious words will cause all participants (regardless of religiosity) to cheat at a low level.

Chapter II

Method

Participants. A total of 122 psychology students participated as part of a course requirement. Data from 22 participants were excluded for awareness of either the prime (n = 13), the dependent variable of cheating (n = 5), or for not following directions (n = 4). Fifty-eight percent of participants were female and 42% were male, with a mean age of 19.89 (SD = 2.33). A majority of the participants (87.8%) reported being Christian.[2] Fifty-one percent of the participants reported being Caucasian, 42% African-American, 4% Asian, 2% Hispanic, and 1% American Indian.

Materials. Two different lists of words were used to prime participants (see Appendix A). These two lists contained either general religious words or concrete religious words. The general and concrete religious words were pretested from a group of 43 undergraduate psychology students. These students rated a list of 152 religious words on a seven-point scale according to the degree to which they perceived the word to be religious. Those words that were rated the highest were selected as primes. The general religious words were based on the religious words used in Pilot Study 2.

The circle test, adapted after Hartshorne and May's (1928) original conception, was used to measure cheating (see Appendix B). The circle figure was taken from Leming (1978), and the instructions given to participants are a variation of Leming's (1978) and Bruggeman and Hart's (1996) use of the test. The use of the circle test to measure cheating was almost identical to that used in Pilot Studies 1 and 2, except that when participants were done with their test they were to write their total score and participant number on a sheet provided in the testing room. This sheet had high scores ostensibly written from past participants. A similar method by Millham (1974) was shown to be effective in increasing the likelihood of cheating.

The funnel debriefing form (see Appendix C) was modeled after Bargh and Chartrand's (2000) and Chartrand's (2000) use as a control measure. The funnel debriefing gave participants several opportunities to disclose awareness of the prime and the dependent variable.

The filler task was a number operations test (see Appendix D). This test consisted of four questions that required the participants to transform simple decimals into fractions, and vice versa. This task was given to participants to clear out the possible influence of the primes on later tasks. A similar task was used in Pilot Study 2 and by other researchers (e.g., Lombardi, Higgins, & Bargh, 1987; Newman & Uleman, 1990).

Religious orientation was measured using Gorsuch and McPherson's (1989) I/E-R scale. This scale was intermixed among a series of 42 other questions concerning attitudes on math performance, automobile driving, job performance, and academic motivation, with ascending and descending order being counterbalanced between-subjects (see Appendix E). Only the eight questions measuring intrinsic religious orientation were analyzed, with all other types of questions acting as distractors. The last question of the questionnaire was used as a control to see if participants' responses were influenced by the priming procedure. Finally, participants completed a demographics form (see Appendix F) assessing participants' age, gender, ethnic background, religious affiliation, year in college, and GPA.

Design and Procedure. The research design was a 2 (cognitive capacity: load vs. no-load) by 2 (prime: general vs. concrete) factorial. Cognitive capacity and type of prime was randomly assigned between-groups. The experimenter was blind to which prime the participant received.

Each participant was tested individually in separate rooms. The room contained a desk on which a personal computer was placed. A chair was positioned next to the desk. The Z and ? keys on the computer keyboard were labeled 'L' for left and 'R' for right, respectively. The computer priming task was run using DOS.

The priming manipulation was adopted from Devine (1989, Experiment 2), Chartrand (2000, Experiment 2), and Murray et al. (2001). Participants were seated so that the distance between their eyes and the fixation point was such that stimuli on either side of the fixation point were presented outside of their fovea. The length of the prime, the mask used, the location of the prime on the computer screen, and the position of the participant were identical to Pilot Study 2. All stimuli presented on the computer screen were black with a white background. A plus sign ('+') served as the fixation point in the center of the computer monitor during the vigilance task. Stimulus words were presented for 80 ms, which was immediately followed by a masking string of Xs for another 100 ms in the same location. Each stimulus word and mask was randomly flashed in one of four locations on the screen. For each of the four locations each stimulus word was approximately 3.6 cm from the fixation point within the participants parafoveal vision. If participants were to look toward the direction of the flash, they still would not be able to see the primed word because they are instructed to focus on the fixation point and 140 ms is the minimum time required for the eye to move from a beginning fixation point to a parafoveal region (Rayner, 1998).

The time between stimulus word presentations varied from 2 to 7 s. Randomized time interval lengths made it impossible for participants to predict the amount of time between flashes. In this way, participants were required to remain watchful because they would not have the ability to anticipate when or where the next stimulus was going to be presented. The precautions described above – short stimulus word presentation, immediate masking, and primed words being flashed in participant's parafoveal vision – have been shown to be effective in keeping participants from becoming consciously aware of the content of the primed words (Chartrand, 2000).

Participants first were given written instructions requesting them to judge as fast as possible whether the flash on the screen was to the left or right of the '+' in the middle of a computer screen by pressing either 'L' for left, or 'R' for right on a keyboard. Participants completed a short pretest session with neutral words to make sure they understood how to perform the task, followed by the experimental session. Before they began the experimental session, participants were presented with either an eight-digit number ('36126854') or a single digit number ('6'). This number was presented for a brief time (approximately 30 s) to participants, who were instructed to memorize the number. They also were instructed to remember this number while they completed the experimental session, and to type the number on the computer when the session was over. This procedure was almost identical to that described in Dijsterhuis, Spears, and Spears (2001, Experiment 2). Participants judged a total of 100 flashes distributed evenly over the four locations on the computer screen. These 100 flashes contained either 20 general religious words, or 20 concrete religious words, randomly repeated five times in each session.

Once the participants finished the first task, they were given the circle task and informed that it was unrelated to the first task. After completing the circle task, participants were given a funnel debriefing form. Only those participants who had no awareness of the prime and dependent variable were retained for analysis. Next, all participants were given the number operations filler task followed by the questionnaire items and told that these tasks were for an unrelated experiment. Finally, participants were fully debriefed.

Chapter III

Results

The cheating task was scored using Leming's (1978) criteria. Leming established a baseline for the circle test by finding the mean score of college students with no opportunity to cheat; he then used three-standard deviations above this mean to represent the upper limit of an honest response. This results in a score of 23 or greater being categorized as cheating, and represents a score that could be achieved 1 out of 1,000 times by chance alone. The baseline and score used by Leming are also very similar to that found by Bruggeman and Hart (1996), who used the same procedure with high school students. Using Leming's criteria, 28% of the participants cheated on the circle test. Specifically, in the general priming group 21% met the criterion for cheating, and 34% of the concrete priming group met the criterion for cheating. A cross-tabulation of these results is presented in Table 1.

Table 1: ***Frequency of Cheating as a Function of Prime.***

	Classified as Cheating		
Prime	No	Yes	Total
General Religious	37 (79%)	10 (21%)	47
Concrete Religious	35 (66%)	18 (34%)	53
Total	72 (72%)	28 (28%)	100

Note: Percentages reflect the percent of people within each prime condition who were or were not classified as cheating.

To analyze these data a series of logistic regressions were conducted (Howell, 2002). The full model of these logistic regressions is presented on Table 2 below. The first logistic regression equation modeled the probability of cheating as a function of the set of control variables. These variables were composed of participants' age, gender, ethnicity (scored as Caucasian vs. other), year in college, and GPA. The overall equation did not provide a significant fit for the data, χ^2 (5, N = 100) = 1.38, $p > .05$. Thus, these factors do not contribute to the probability of being classified as cheating on the circle task.

Adding the main effects of the words participants were primed with and whether or not the participants were under a cognitive load during the priming procedure, along with participants' intrinsic religiosity score did not improve the fit of the model, χ^2 (8, N = 100) = 3.87, $p > .05$. Only the priming measure was somewhat suggestive as a predictor. The next logistic regression equation modeled the probability of cheating as a function of the predicted two-way interaction between prime and cognitive load. Adding the two-way interactions into the model failed to provide a significant improvement in fit for the data, χ^2 (11, N =100) = 5.53, $p > .05$, and adding intrinsic religiosity into a three-way interaction also showed a nonsignificant fit, χ^2 (12, N = 100) = 5.66, $p > .05$. Removing the control variables, main effects, and two-way interactions still did not provide a significant fit for the data, χ^2 (1, N =100) = 1.21, $p > .05$. Thus, these factors rendered no interactive contribution to the probability of being classified as cheating on the circle task.

Table 2: ***Logistic Regressions Predicting Classification as a Cheater from Control Variables, Main Effects, and Interactions.***

Predictor Entered	B	Wald	Probability
Control variables, main effects, and interactions χ^2 (12, N = 100) = 5.66			
Age	-.128	.644	.42
Gender	-.131	.070	.79
Ethnicity	-.023	.002	.96
Class	.277	.751	.39
GPA	.045	.012	.91
Prime	5.507	.516	.473
Load	3.788	.247	.619
Intrinsicness	.122	.068	.794
Prime X Load	-2.751	.369	.544
Prime X Intrinsicness	-.059	.048	.827
Load X Intrinsicness	-.109	.162	.687
Prime X Load X Intrinsicness	.057	.129	.719
Constant	-6.654	.230	.632

Leming's criteria represents a strict measurement of cheating, in which a score is so extreme that it would be expected to occur by chance fewer than 1 in 1000 times. To examine the more subtle influence of priming, load, and religiousness on likelihood to cheat, the data were analyzed with a 2 (cognitive load) by 2 (prime) by 2 (intrinsic religiousness) ANOVA, using number correct on the circle task as a dependent variable. In order to use ANOVA, a median split was performed on intrinsic religiousness scores. The descriptive statistics for this ANOVA are provided on Table 3. A summary of the results is displayed on Table 4.

Table 3: ***Circle Task Mean Scores, by Cognitive Load, Prime, and Religiosity.***

	Low Religiosity		High Religiosity	
Prime	No Load	Load	No Load	Load
General				
M	15.23	15.40	17.20	17.21
SD	6.40	9.74	8.74	7.36
Concrete				
M	18.00	17.83	21.37	18.31
SD	7.08	7.02	8.96	7.71

Note: Higher scores reflect increased performance and greater likelihood of cheating.

Table 4: ***ANOVA Summary Table: Effects of Load, Prime, and Religiosity on Cheating***

Source	Sum of Squares	df	*F*	Sig.
Cognitive Load	14.22	1	.22	.63
Prime Received	167.53	1	2.68	.10
Level of Intrinsicness	89.02	1	1.42	.24
Load X Prime	17.85	1	.28	.59
Load X Intrinsicness	.01	1	.00	.99
Load X Prime X Intrinsicness	11.52	1	.18	.67
Error	5750.85	92		

As Table 4 shows, the main effect of prime is once again marginally significant, F (2, 97) = 2.68, p = .10. The main effects of load, level of intrinsic religiosity and all two-way interactions failed to reach significance. The results of the three-way interaction also failed to reach significance, F (2, 97) = .184, p > .05. As would be expected, these results were similar to the results of the logistic regression. Comparable results were also found in regression analyses that did not rely on a median split of the intrinsic religiousness score.

Given the specificity of the hypothesis of social assimilation and contrast, a planned comparison between the general and concrete religious prime groups was performed (Keppel & Zedeck, 1989). A t-test confirmed that participants in the concrete religious word primed group (M = 19.06, SD = 7.77) did score significantly higher on the circle task than did the general religious word primed group (M = 16.28, SD = 7.77), t (98) = -1.78, p < .04 (one-tailed).

Chapter IV

Discussion

The two original hypotheses were 1) participants primed with concrete religious words (regardless of intrinsic religiosity) would cheat at a higher level than would participants primed with general religious words; 2) under a cognitive load, both concrete and general religious word primed participants (regardless of intrinsic religiosity) would cheat at a similar low level. Only the first hypothesis was confirmed.

Despite these mixed results, a higher level of cheating was observed in the concrete religious prime group than in the general religious prime group, confirming the first hypothesis. This pattern is consistent with work by several groups of researchers including Biernat, Manis, and Kobrynowicz (1997), Coleman (2003), and Dijksterhuis and colleagues (1998). A common point among these studies is that concrete and general priming can generate simultaneous and parallel contrast and assimilation effects. For example, activating the exemplar and stereotype of a category can produce opposing effects (Dijksterhuis et al., 2001). The present study suggests a similar process in the activations of religious representations, and in subsequent behavior, consistent with the finding that both perceptual and behavioral effects are primed at the same time (Bargh, 1997).

Previous demonstrations of contrast and assimilation behavioral effects have only used supraliminal priming techniques (Coleman, 2003; Dijksterhuis et al., 2001; Dijksterhuis et al., 1998). The present study used a subliminal technique and found evidence of automatic contrast to the primed exemplar despite the fact that subliminal priming is not as strong as supraliminal priming (Bargh & Chartrand, 2000; for the conscious equivalent see Eagly & Chaiken, 1993). The suggested contrast effect found with the use of subliminal priming is noteworthy in light of Macrae et al.'s (1998) finding that exemplar primes increasingly prompt assimilation as awareness decreases. In retrospect, however, the suggested contrast effect found in the concrete prime group may have been moderated by the dependent variable that required participants to compare their score with other people's scores. This social comparison process may have interrupted somewhat the automatic comparison between the concrete primes and the self (Dijksterhuis & Bargh, 2001).

A good example of the possible influence of the comparison process in the dependent variable is the curious result of participants cheating in the general religious prime group. Cheating in the general religious word group was not found in two prior pilot studies. The alternate social comparison process may have inadvertently altered the effect of the general religious prime. It is possible that the level of arousal produced from the discrepancy between the participants score and the scores ostensibly written by other participants inhibited the general religious prime participants had just received (Dijksterhuis & Bargh, 2001). By having participants write their total score on a sheet of high scores ostensibly from past participants, it seems likely that participants experienced too much self-focus (McCallister, 1996). This appears to have had a substantial impact on the results, and future researchers should carefully consider the subtleties of similar manipulations.

Other explanations may also account for the rate of cheating in the general religious prime group. First, the current study represents a much larger sample size (100 compared to 45 and 47). An increase in sample size increases the likelihood of someone cheating. Second, despite the multiple controls used to ensure subliminal presentation of the primes, it is possible that participants were more aware of the prime than was known. In fact 10.7% of participants were not included in the data analyses because of some type of awareness of the prime. Conscious awareness of a prime, that causes assimilation nonconsciously, may cause contrast effects instead (Lombardi et al., 1987; Newman & Uleman, 1990). Future research needs to avoid introducing an alternate social comparison in the dependent variable, and when using subliminal techniques, should employ faster word presentations.

There are a few possible reasons for the lack of evidence for the second hypothesis that predicted that both concrete and general religious primed groups would cheat at a similar low level under a cognitive

load. The most obvious reason for a lack of effect is that the task meant to produce a cognitive load was not sufficient to do so. Follow up analyses showed, however, that the cognitive load task did tax participants' cognitive resources, with 5% missing one number, 9% missing two numbers, and 7% missing half of the numbers in recall. Since none of the participants failed to recall fewer than half the numbers, it appears that they were trying to keep the number in memory (Bargh & Chartrand, 2000). An alternative reason may come from examining the differences between the current experiment and Dijksterhuis et al. (2001, Experiment 2). The present experiment presented familiar exemplars subliminally and found no effect under a cognitive load. In contrast, Dijksterhuis et al. (2001) presented unfamiliar exemplars supraliminally and found assimilation effects under a cognitive load. These differences are important in light of past research showing (a) that contrast effects are more likely when the exemplar being primed is more familiar or more extreme (Stapel, Koomen, & van der Pligt, 1997), and (b) that social comparisons are quick and spontaneous (Gilbert, Giesler, & Morris, 1995). A cognitive load may not be strong enough to weaken an extreme exemplar representation in which spontaneous comparison is facilitated (Martin et al., 1990). In order to address these problems, future research manipulating cognitive load should use supraliminal priming with less extreme exemplars.

Future Directions

As the current study implies, nonconscious processes are often anything but crude and simple. For example, automatic goal pursuit will systematically interact with current information coming from the environment. A classic example of this is driving a car for hours while daydreaming and later having no memory of the driving process itself (Bargh & Barndollar, 1996). Because automatic processes are not consciously experienced, one makes sense of them by theories regarding what could have caused one to feel or act in that way (Bargh, 1997; Bargh & Gollwitzer, 1994; Nisbett & Wilson, 1977). Nevertheless, it is conscious processing that typically first constructs, modifies, and repeatedly engages in the eventual automatic processes (Bargh, 1990; Bargh & Gollwitzer, 1994; Eagly & Chaiken, 1993). This influences a person's automatic goals to align with their valued life purposes (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trotschel, 2001). Automatic goal pursuit makes it more likely that behavior will satisfy our enduring motivations without wasting limited cognitive resources (Chartrand, 2000). The current study is consistent with research indicating that goal representations are automatically linked not only from repeated conscious representations of those situations in which the goal has been pursued in the past, but by representations of types of people and stereotypes that may automatically activate the goals and intentions associated with them (e.g., Bargh et al., 2001).

Despite the automatic contrast effect suggested in the current study, most automatic behavior is likely to be assimilative. The assimilative nature of automaticity can be quite positive and functional, allowing for convergence in attitudes, producing social cohesion (Dijksterhuis et al., 1998). For example, the automatic behavioral tendency to imitate leads to belonging and social acceptance by increasing prosocial behavior not only toward the mimicker, but toward other people as well (Chartrand & Bargh, 1999; van Baaren, Holland, Kawakami, & van Knippenberg, 2004).

Automatic behavior, of course, does not occur in a vacuum. It emerges in interacting with other people including those who serve as exemplars of various constructs (Dijksterhuis et al., 1998). In this way, the current results support Turner's (1987) self-categorization theory. According to Turner, individuals form a shared social categorization that contrasts with others. In a given situation, this psychological group becomes the basis of an individual's attitudes and behavior. Self-categorization allows a person to depersonalize individual behavior and self-perception so that the person can then take on and internalize the quality of the social whole. This collective process is adaptive in that it allows group members to form shared group norms and to make meaningful communications which create empathy and understanding (Turner, 1987). Nevertheless, the adaptive value of self-categorization regarding religious beliefs may be mediated by the complexity of one's own set of beliefs (see Eagly & Chaiken, 1993). Future research is needed to explore this possibility.

The current results do suggest that the perceived stereotypes of religious people may be assimilated automatically. These results must be viewed with caution because of the use of only one type of behavior

(honesty) as a measure. Eagly and Chaiken (1993) share this caution in their review of the literature on evaluations towards targets. Future research in the automatic activation of religious representations will need to follow a reaction time accessibility paradigm such as that used by Dijksterhuis et al. (2001, Experiment 3). In their study a lexical-decision task measured the accessibility of words for intelligence, stupidity, or unrelated concepts. These words were subliminally primed with self-concept words or unrelated words. They found that participants primed with Einstein (a concrete prime) showed a strong link between self-concept and stupidity, while participants primed with professor (a general prime) only made the concept of intelligence more accessible. This kind of direct accessibility link is needed in studies of automatic behaviors in order to better delineate cognitive processes and the expression of religious representations.

In a related vein, future research is needed in order to understand how religious representations affect actual behavior. Generally, evaluations correlate poorly with behavior because a general evaluative assessment is compared to specific behavior (Bargh & Barndollar, 1996; Eagly & Chaiken, 1993). It may be that different environmental events trigger different cognitive motivations among religious representations which, in turn, affect one's efforts to preserve consistencies among beliefs, or to defend one's beliefs (e.g, Bargh, 1996). This process may be mediated by such things as implementation intentions (e.g., Bargh & Gollwitzer, 1994) and information accessibility (e.g, Eagly & Chaiken, 1993). Studying the automaticity of religious representations may provide a greater understanding of these processes.

Most demonstrations of the automatic activation of mental representations and resulting behavioral effects have been conducted in the context of specific stereotypes. Taken in conjunction with Murray et al. (2001) the current research suggests that the automatic activation of mental representations may apply to a wide range of targets and settings and that automatic behavior is broader and more varied than previously shown. Where then does consciousness fit in with nonconscious effects? As Bargh put it, "Although automaticity keeps us tied to the present, consciousness is floating ahead in time, setting up strategic automatic contingencies for the future…, to keep us responding fluently and appropriately in that present when it comes" (1997, p. 244).

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Endnotes

[1] For specific details on Pilot Studies 1 and 2 please see Randolph-Seng, B., & Nielsen, M. E. (in press). Honesty: One effect of primed religious representations. *The International Journal for the Psychology of Religion.*

[2] Two participants omitted religious affiliation information.

[3] A third interpretation may be that the activation of religious representations via religious words simply puts someone in a more positive mood increasing their likelihood of trying harder on the circle task. However, if this were the case then the sports words should have had a similar effect on cheating behavior as the religious words, which they did not.

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APPENDIX A: TARGET PRIME WORDS

General Religious Primes

heaven	faith	holy	church	saint
bless	prayer	worship	resurrection	prophet
gospel	salvation	baptism	commandments	sabbath
cross	saved	amen	communion	preacher

Concrete Religious Primes

Abraham	Christ	Jesus	Jehovah	James
Isaac	Noah	Elijah	Malachi	John
Jacob	Paul	Moses	Teresa	Messiah
Mary	Isaiah	Ezekiel	Peter	Gabriel

APPENDIX B: CIRCLE TASK

Please Read First. Instructions: This task measures your coordination perception which has been found to correlate with IQ scores. Please read **all** of the directions first and ask **all** questions you may have about the task **before** beginning.

1. Put the point of your pencil on the X at the bottom of the oval on the second page.

2. While leaving your pencil in this position, **shut your eyes** and then attempt to put the correct number in the corresponding circle (i.e., put a 1 in circle 1, a 2 in circle 2, and so on to 10) **with your eyes shut**. Repeat this procedure five times. It may be necessary to erase some of your marks before subsequent trials to avoid confusion in your scoring.

3. After each of the five trials put a check mark in the score box (at the bottom of the next page) under the number of each circle that you got at least half of the right number in the circle. Count the checks and enter the total in the last column labeled T after you are done with the five trials.

4. After you are done with the fifth trial, add up the T column and write the sum between the two lines under the T column - this is your total score.

5. **PLEASE REMEMBER TO WRITE YOUR TOTAL SCORE ON THE TOTAL SCORE PAPER ON THE WALL AND TO CIRCLE POOR, AVERAGE, OR EXCELLENT ON NEXT PAGE.**

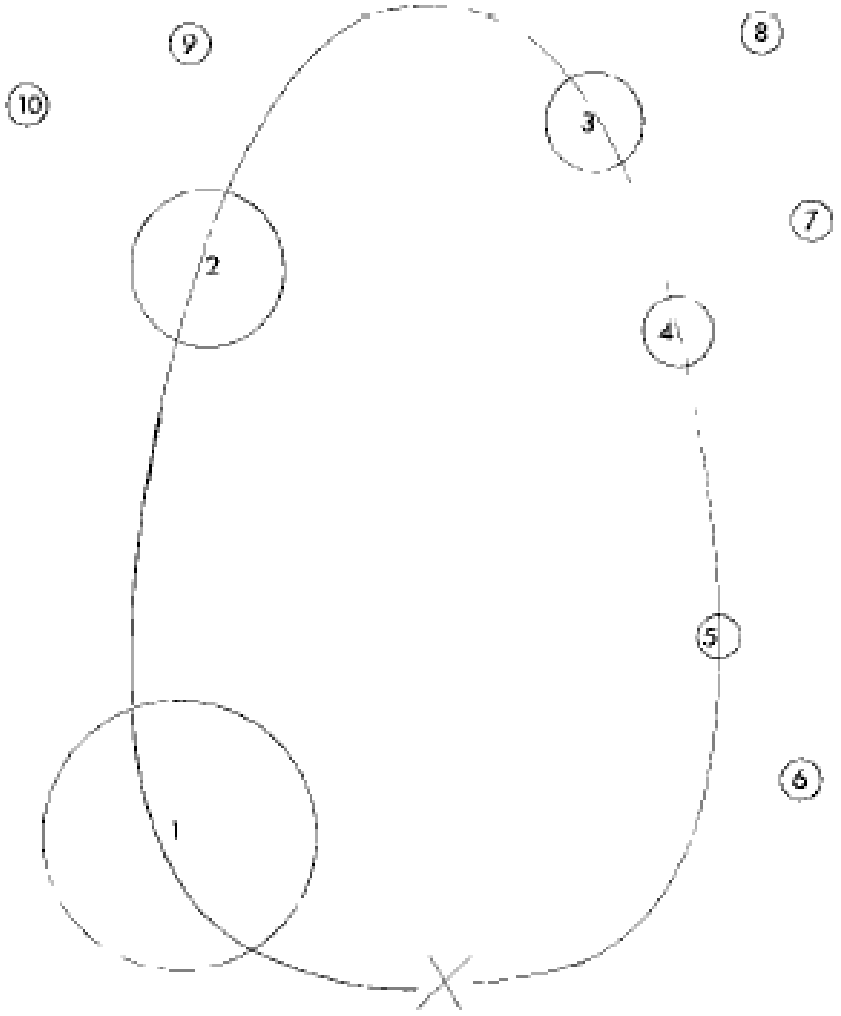
The *maximum* score is 50. The *average* score for college students in this task is 28. You will have as much time as you need to complete this task, but work as fast and efficient as possible. **Remember** to complete the T column and to write your TOTAL score under the T column and then write this score and participant identifier on the paper labeled "Total Scores" posted on the wall, when you are done with the last trial.

Scoring: A score of 1-20 = Poor Coordination Perception; a score of 21-30 = Average Coordination Perception; and a score of 31-50 = Excellent Coordination Perception. **Please record which of the three you are at the top of the next page.**

Once you have read and understand these instructions please begin with the first trial on the next page.

Circle the one that applies to you:

Poor Average Excellent



SCORE BOX

Circles	1	2	3	4	5	6	7	8	9	10	T
Trial 1											
Trial 2											
Trial 3											
Trial 4											
Trial 5											

TOTAL SCORE = | |

APPENDIX C: FUNNEL DEBRIEFING FORM

Instructions: Please answer each question as honestly as possible.

1. What do you think the purpose of this experiment (the whole thing) was or was trying to study?

2. Did anything about the experiment seem strange to you, or was there anything you were wondering about?

3. Did you think that any of the different tasks were related in any way?
   (If yes) In what way were they related?

4. Did anything you did on one task affect what you did on any other task?
   (If yes) How exactly did it affect you?

5. What did you think the flashes were during the first vigilance task? Be as specific as you possibly can be.

APPENDIX D: FILLER TASK

NUMBER OPERATIONS TEST

Solve the following problems and circle the best answer from those given.

1. 3.44 =

$\frac{14}{25}$

$\frac{33}{25}$

$3\frac{11}{50}$

$3\frac{22}{25}$

2. $6\frac{3}{4}$ - 6.32 =

0.33

0.39

0.43

0.57

0.68

3. Which of the following is less than $\frac{1}{6}$?

0.1667

$\frac{3}{18}$

0.167

0.1666

$\frac{8}{47}$

4. $\frac{(0.02)(0.0003)}{0.002}$ =

0.3

0.03

0.003

0.0003

0.00003

APPENDIX E: FIFTY-SEVEN ITEM SURVEY

Instructions: Please indicate the extent to which you agree or disagree with each item below by using the following rating scale:

1	2	3	4	5
I strongly disagree	I tend to disagree	I'm not sure	I tend to agree	I strongly agree

1. Driving is a cooperative affair in which the motorists share alike on the highways._____

2. Teachers should encourage pupils to study and criticize our own and other economic systems and practices._____

3. Every driver should be required to pass an examination on the rules of the road._____

4. I go to church mainly because I enjoy seeing people I know there._____

5. I am happier in a math class than in any other class._____

6. The goals of education should be dictated by children's interests and needs, as well as by the larger demands of society._____

7. I enjoy reading about my religion. _____

8. Schools of today are neglecting the three R's._____

9. One can never feel at ease on a job where the ways of doing things are always being changed._____

10. The backbone of the school curriculum is subject matter._____

11. I go to church because it helps me make friends._____

12. Pedestrians should yield the right of way to motorists._____

13. One of the big difficulties with modern schools is that discipline is often sacrificed to the interests of children._____

14. It doesn't much matter what I believe so long as I am good._____

15. Children need and should have more supervision and discipline than they usually get._____

16. Drivers with many years of experience should not be required to submit to reexamination in later years.

17. It is important to me to spend time in private thought and prayer._____

18. Improved construction of automobiles makes driving skill less necessary today than five years ago._____

19. Discipline should be governed by long-range interests and well-established standards._____

20. Drivers of automobiles should be more concerned with the welfare of their passengers than of themselves._____

21. Mathematics is very interesting to me, and I enjoy math courses._____

22. I have often had a strong sense of God's presence._____

23. A driver really is the best judge of the speed he should be permitted to drive._____

24. People are as courteous behind the wheel as they are at any other time._____

25. I pray mainly to gain relief and protection._____

26. The occurrence of accidents is a matter of chance and should be regarded as unavoidable._____

27. When I hear the word math, I have a feeling of dislike._____

28. The trouble with most jobs is that you just get used to doing things in one way and then they want you to do them differently._____

29. To accommodate the traffic, the cooperation of all drivers is necessary._____

30. Inexperienced drivers should not be arrested for running through traffic lights._____

31. I try hard to live all my life according to my religious beliefs._____

32. Every motorist should be required to pass a driving-skill test once every five years._____

33. When I get used to doing things in one way, it is disturbing to have to change to a new method._____

34. The present emphasis on the enforcement of traffic rules should be reduced._____

35. The job that you would consider ideal for you would be one where the way you work is always the same._____

36. What religion offers me most is comfort in times of trouble and sorrow._____

37. If I could do as I pleased, I would change the kind of work I do every few months._____

38. Prayer is for peace and happiness._____

39. I would prefer to stay with a job that I know I can handle than to change to one where most things would be new to me._____

40. The trouble with many people is that when they find a job they can do well, they don't stick with it._____

41. Although I am religious, I don't let it affect my daily life._____

42. Mathematics is fascinating and fun._____

43. I like a job where I know that I will be doing my work about the same way from one week to the next._____

44. I go to church mostly to spend time with my friends._____

45. Mathematics makes me feel secure, and at the same time it is stimulating._____

46. It would take a sizeable raise in pay to get me to voluntarily transfer to another job._____

47. Learning is experimental._____

48. My whole approach to life is based on my religion._____

49. My mind goes blank and I am unable to think clearly when working math._____

50. No subject is more important than the personalities of the pupils._____

51. I feel a sense of insecurity when attempting mathematics._____

52. Although I believe in my religion, many other things are more important in life._____

53. No person should be denied the right to drive an automobile._____

54. Children should be allowed more freedom than they usually get in the execution of learning activities._____

55. Teachers, like university professors, should have academic freedom._____

56. Curriculum should consist of subject matter to be learned and skills to be acquired._____

57. When you were filling out this questionnaire, what were you basing your answers on? In other words, how did you decide how to respond to the questions? (Use the back of this paper if needed.)

APPENDIX F: DEMOGRAPHICS FORM

Instructions: Please provide the following information about yourself.

Age in Years:_____

Religious affiliation:_____

GPA:_____

Please circle the appropriate choices below.

Gender: Male Female

Ethnicity: 1. American Indian or Alaskan Native

2. Asian or Pacific Islander

3. African American, Black

4. Hispanic or Latino

5. White Non-Hispanic Origin

6. Other _____

Academic Classification: Fr Soph Jr Sr