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INFORMING MORAL DECISIONS WITH RELIGIOUS IMAGES: AN EXAMINATION OF ASSOCIATIVE PRIMING

by

SARAH CAVRAK

Under the Direction of Dr. Heather M. Kleider

ABSTRACT

Symbols represent information we have previously learned or experienced, but they can also serve to encourage thoughts and behaviors that are consistent with this knowledge/experience in order to maintain social cohesion (Guthrie, 1996). Pictures (e.g., American Red Cross image) representing moral rules (e.g., 'save lives') have been shown to influence moral decisions (Broeders, van den Box, Muller, & Ham, 2011), but there is no empirical evidence to demonstrate that religious pictures encourage the same outcome. Four studies examined whether religious pictures would influence decision making (lexical, moral), and furthermore whether personal belief in religion was a moderating factor. In Study 1, participants viewed religious and neutral (control) pictures, and then made a series of lexical decisions (Meyer &

Schvaneveldt, 1971). In Study 2, participants viewed religious and neutral words (which represented the pictures viewed in Study 1), and then made lexical decisions. In Studies 3 and 4, participants made decisions about moral actions. Moral decisions were preceded by viewing pictures in Study 3, and by words in Study 4. Self-reported religiosity was assessed last in each experiment. Across the four studies, we found support for the influence of religious pictures on decision making. In Studies 1 and 2, lexical decisions were faster to religious words when primed with religious pictures. In Study 3, participants rated morally ambiguous actions as less appropriate when primed with religious pictures. This occurred to a greater degree for religious participants. In Study 4, there was a general priming effect of religious words, but this was not influenced by individual religious beliefs.

INDEX WORDS: Religion, Moral decision making, Priming, Symbols, Imagery

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AN EXAMINATION OF ASSOCIATIVE PRIMING

by

SARAH CAVRAK

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

in the College of Arts and Sciences

Georgia State University

2013

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Sarah Elizabeth Cavrak
2013

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by

SARAH CAVRAK

Committee Chair: Heather Kleider

Committee: David Washburn

Sarah Brosnan

John Snarey

Electronic Version Approved:

Office of Graduate Studies

College of Arts and Sciences

Georgia State University

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS ..... **iv**

LIST OF TABLES ..... **ix**

LIST OF FIGURES ..... **x**

1 INTRODUCTION **1**

1.1 Picture Symbols **1**

1.1.1 Picture Symbols and Moral Rules ***3***

1.2 Pictures vs. Images **4**

1.3 Priming **6**

1.4 Religion **9**

1.4.1 Religion and Morality ***10***

1.5 Overview of Studies **12**

2 PILOT STUDY – SELECTION OF PICTURES AND WORDS **15**

2.1 Method **15**

2.1.1 Participants ***15***

2.1.2 Materials ***15***

2.1.3 Procedure ***16***

2.2 Results **17**

3 STUDY 1 – PICTURES AS SYMBOLS ON LEXICAL DECISIONS **17**

3.1 Method **18**

3.1.1 Participants ***18***

3.1.2 Materials ***18***

3.1.3 Procedure ***18***

3.2 Results **19**

3.2.1 Design ***19***

3.2.2 Items Analysis ***20***

3.2.3 Data Preparation ***20***

3.2.4 Manipulation Check ***20***

3.2.5 Primary Analyses ***21***

3.2.1 Follow-up Analyses ***22***

3.3 Discussion **22**

4 STUDY 2 – WORDS AS SYMBOLS ON LEXICAL DECISIONS **23**

4.1 Method **24**

4.1.1 Participants ***24***

4.1.2 Materials ***24***

4.1.3 Procedure ***24***

4.2 Results **25**

4.2.1 Items Analysis ***25***

4.2.2 Data Preparation ***25***

4.2.3 Manipulation Check *25*

4.2.4 Primary Analyses *25*

4.3 Discussion **30**

5 STUDY 3 – PICTURES AS SYMBOLS ON MORAL JUDGMENTS **32**

5.1 Method **33**

5.1.1 Participants *33*

5.1.2 Materials *33*

5.1.3 Procedure *34*

5.2 Results **35**

5.2.1 Manipulation Check *35*

5.2.2 Data Preparation *35*

5.2.3 Primary Analyses *35*

5.3 Discussion **36**

6 STUDY 4 – WORDS AS SYMBOLS ON MORAL JUDGMENTS **37**

6.1 Method **37**

6.1.1 Participants *37*

6.1.2 Materials *37*

6.1.3 Procedure *38*

6.2 Results **38**

6.2.1 Manipulation Check *38*

6.2.2 Data Preparation *38*

6.2.3 Primary Analyses *38*

6.3 Discussion **39**

7 GENERAL DISCUSSION **40**

7.1 Review of experimental findings **40**

7.2 Moral Decision Making **41**

7.2.1 Religion *41*

7.2.2 Religious Beliefs *42*

7.2.3 Imagery *45*

7.3 Priming **46**

7.4 Conclusions **48**

REFERENCES **49**

APPENDICES **59**

Appendix A **59**

Appendix B **60**

Appendix C **69**

Appendix D **71**

LIST OF TABLES

Table 1. (Study 1, 3) Pictures used as primes 59

Table 2. (Study 1, 2) Words used in the lexical decision task 60

Table 3. (Study 2, 4) Words used as primes 69

Table 4. (Study 3, 4) Action phrases used in the moral judgment task 71

LIST OF FIGURES

Figure 1. (Study 1) Picture Prime x Word Type interaction on average RT to accurate lexical decisions. Error bars represent standard error. 21

Figure 2. (Study 2) Word Prime (*concrete*) x Word Type interaction on average RT to accurate lexical decisions. Error bars represent standard error. 27

Figure 4. (Study 2) Word Prime (*abstract*) x Word Type interaction on average RT to accurate lexical decisions. Error bars represent standard error. 29

Figure 3. (Study 2) Religious Prime x Word Type interaction on average RT to accurate lexical decisions. Error bars represent standard error. 29

Figure 5. (Study 3) Participant Religiosity x Picture Prime interaction on average rating of moral appropriateness to ambiguous action phrases. Error bars represent standard error. 36

1 INTRODUCTION

Symbolic forms (e.g., language, pictures) are routes to representing knowledge. These representations communicate thoughts, experiences and emotions, are adaptive to different contexts and cultures, and potentially are important aids for survival (Benjafield, 1992). Pictures are unique because they synchronously represent information, that is, elements of an object or event. This information representation is useful as it then guides behavior. Pictures, therefore, can become icons which communicate an expected behavior (Benjafield, 1992; 2007). For example, the American flag represents information like freedom and democracy (Ortner, 1973), and, arguably, a host of information related to specific freedoms or affordances located within the bill of rights and the constitution. Seeing the American flag may simply bring to mind your knowledge of democracy or it might encourage you to act or vote in a way that is consistent with your knowledge of what it means to be an "American." For a religious person in the Christian tradition, the crucifix may represent information related to the teachings of Jesus such as love, faith, and peace. Importantly, the latter two image examples represent more than one semantic concept simultaneously. **The current set of studies will test whether religious pictures (e.g., crucifix, crown of thorns) concurrently prime religious knowledge, thus influencing decision making.**

1.1 Picture Symbols

Generally speaking, symbols represent information we have previously learned or experienced, but they can also serve to encourage thoughts and behaviors that are consistent with this knowledge/experience in order to maintain social cohesion (Guthrie, 1996). Carlston and Mae (2007) simultaneously presented trait-implying symbols (e.g., a picture of a rose implied the trait

‘romantic’) alongside a target individual and found that the target was later perceived as having the traits implied by the symbol. The authors concluded that symbols, due to their ubiquitous nature, inform impression formation with and without intentionality of the observer. Hassin, Ferguson, Shidlovski, and Gross (2007) conducted two studies and found that visual exposure to one’s national flag influenced personal opinions on key political issues, such that right versus left wing Israeli participants converged on political opinions when primed with the Israeli flag relative to those primed with a control image.

Geertz (1973) suggested that religion, a unifying set of beliefs and practices that create moral community (Durkheim, 1995), is further defined by its use of symbology, which activate long-term goals, in order to motivate people along a religious path, in part because symbols are culturally important and emotion-provoking (Ortner, 1973). Baldwin, Carrell, and Lopez (1990) found that female Catholic participants who were primed with a picture of the Pope displaying a disapproving expression made lower self-evaluations than those who saw a disapproving expression on the picture of an unknown person. In a series of two studies, Weisbuch-Remington, Mendes, Seery, and Blascovich (2005) further found that religious pictures influenced cardiovascular responses when performing a subsequent task (i.e., giving a speech about visiting the dentist or one’s own death). They found that participants exposed to a negative religious picture (i.e., demons) exhibited threat-like cardiovascular responses relative to those exposed to a positive religious picture (e.g., Christ ascending to heaven).

Beyond beliefs and impressions, symbols have also been found to influence behavior. Bering (2006) and Bering, McLeod, and Shackelford (2005) found that priming supernatural ideas (e.g., “ghost”) influenced cheating behavior in three-year olds, as well as in college students. Joly and Stapel (2009) found that Dutch children who were primed with pictures associated St.

Nicholas (e.g., miter, staff, book) subsequently engaged in sharing behavior relative to children who were primed with a neutral picture. Hassin and colleagues (2007) conducted a third study and found the response gap between right and left wing participants again merged when the Israeli flag was presented, and influenced both voting intentions as well as voting behavior. These data support arguments that the influence of pictures as symbols occurs automatically (Bargh, 1994), and outside one's conscious awareness (Guthrie, 1996).

1.1.1 Picture Symbols and Moral Rules

Broeders, van den Bos, Muller, and Ham (2011) examined whether exposing participants to picture symbols, representing moral rules, would facilitate responses consistent with those rules or not. Moral rules, according to Looy (2004), are prescriptions of "good" and "bad", representing the purpose of our human nature, and which fluctuate relative to location (e.g., history, culture, religion). Moral rules may have their origin in genetic expression, such that the replication of moral rules across social entities is primarily a reflection of our innate biology. Others argue that moral rules are not bounded by biology, but that they are socially constructed, and contribute to the longevity of community (e.g., Haidt, 2001). Broeders and colleagues (2011) had participants complete a small jigsaw puzzle that formed the American Red Cross logo (a symbol representing the moral rule "save lives"), the Peace logo (representing the rule "do not kill"), or a bicycle wheel (a neutral symbol not representative of any moral rule). Then participants were presented with the classic footbridge problem scenario. In this scenario, participants are told that a trolley is traveling down a set of tracks and cannot use its brakes. In its unstoppable course it will kill five men working at the end of the tracks. You are standing on a footbridge located above the tracks, and have the opportunity to prevent the five workmen from dying, but to do so you must push a man (who is standing next to you on the footbridge) onto the tracks.

His body will stop the trolley from killing the five workmen, but will kill him in the process. In this scenario, the life of one person is placed in opposition to the lives of five others. Broeders and colleagues found that participants reported a greater tendency to intervene in the situation if exposed to the "save lives" symbol relative to either the "do not kill" or neutral symbols.

These data provide additional evidence that pictures are symbolically representative of information other than what is visible through the image features alone, and furthermore that they demonstrate the influence of picture symbols on decision making within a moral domain. Additionally, participants' decisions were consistent with the rule represented, such that, participants intervened in the scenario to save the maximum number of lives when shown the "save lives" moral rule symbol. **What remains untested is whether religious symbols will have a similar influence on moral decision making. Given that religion is viewed by some as the primary source for one's moral education (e.g., Winchester, 2008), it follows then that religious pictures should prime the learned tenets of one's faith, and thus influence moral judgments. The current experiments will test this relationship.**

1.2 Pictures vs. Images

According to dual-coding theory (Paivio, 1971, 1986, 1991), there are alternate systems which represent sensory input: logogens and imagens. Logogens are units that represent verbal input, whereas imagens are units that represent visual input. Because language proceeds sequentially, logogens correspond to sequential perception. Conversely, because units of visual information are presented simultaneously, imagens therefore are perceived simultaneously. Although imagens are internally produced (i.e., mental images), they are associated with external objects (or elements of external objects). Mental images have been shown to facilitate learning (e.g., of word pairs) relative to verbal learning alone (Bower, 1970). According to Paivio (as cited in

Benjafield, 1992), imagery is the effortless production of an internal picture prompted from an external stimulus. Although produced differently, external visual stimuli (hereafter referred to as pictures) and internal imagery (hereafter referred to as images) are equally as effective at encouraging a desired outcome because their representations are functionally the same (as demonstrated by mental rotation studies), and both can guide overt behavior (Shepard, 1978; Shepard & Chipman, 1970). Bower (1970) suggested that images are better remembered than words because they are more distinctive or because the relational encoding of the learned image/word stimulus is stored with more semantic connections in memory. Given the unique role of images in associative learning and memory, images thus become representative, or symbolic, of the experiences (i.e., objects, events) to which they are associated (Paivio, 1969). Furthermore, visual input (picture or image) is remembered better than verbal (words) (Roediger, 2008).

Words can also be symbolic of related information and experience (Bower, 1972; Paivio, 1969). Concrete words (i.e., words that evoke an image), relative to abstract words (i.e., words that do not evoke an image), become meaningful because of their association to external objects or events, such that presentation of the word may eventually prompt the production of other associated verbal and visual items (Paivio, 1969). These associations arguably lead to priming, whereby a concrete item might lead to the production of an abstract (but associated) item. For example, the concrete word ‘church’ might prime the abstract word ‘religion’. Under other circumstances, one modality could prompt the other – such that a concrete word may bring to mind an internal image, or an external picture may conjure its verbal marker. Although pictures, and verbal markers of these pictures, can both be symbolic representations with regard to associated items, the influence of pictures has been demonstrated to be stronger (e.g., greater memory; Bower, 1972; Paivio, 1969) than words - even if those words are concrete. In general, the order

of effectiveness begins with abstract items on the lower end, followed by concrete items, and is strongest for visual objects or pictures (Paivio, 1969).

1.3 Priming

The effectiveness of any symbol (picture or word) is directly related to one's knowledge (i.e., memory) of the item and its associations. Miller (2009) argued that memory is a foundational element of religion, and seemingly a person could not engage in a religious ritual (e.g., baptism, eucharist) without first knowing and remembering the ritual procedure, or apply religious doctrine to personal circumstances, if they have not learned and understood the tenets. Thus, it has been argued that religion forms and maintains a moral community, and guides the construction of our moral selves (Winchester, 2008). **The current set of studies test whether religious symbols (pictures, words) bring to mind (i.e., prime) related associations in memory, and thus guide moral decisions.**

Priming occurs by presenting a stimulus which then facilitates access to other semantically related content (Benjafield, 2007; Schacter, 1987; Tulving & Schacter, 1990). If conducted in the confines of a specific task, then the priming stimulus should encourage a semantically related response. Priming has been shown to impact thought processes, decisions, behaviors, or a combination of these (e.g., Jacoby & Hollingshead, 1990; Jacoby & Kelley, 1992; Kelley & Jacoby, 2000). In a traditional priming experiment, a set of stimuli (e.g., words, names) are presented first. Then, a recognition task is performed wherein the previously presented stimuli are shown along with previously unseen (or new) stimuli. If more previously seen stimuli items are recognized relative to the unseen items, then priming is said to have occurred (Tulving & Schacter, 1990). Jacoby and Hollingshead (1990) found that exposing participants to misspelled words increased the likelihood of unintentionally misspelling those words when required to correctly

reproduce a series of audio presented words at test. Other examples of priming tasks fall into two categories: perceptual and conceptual. Examples of perceptual tests include lexical decisions (wherein people perform word/nonword judgments; Meyer & Schvaneveldt, 1971), word completion tasks (i.e., having studied the word PYRAMID, and then shown the fragment '-Y-A-ID' at test), identification of perceptually degraded words, as well as recall and recognition memory tests. An example of a conceptual test would include category-associations where one is given the name of a category (e.g., 'bird') and told to identify the first item that comes to mind that is associated with that category (e.g., 'eagle').

Associative priming occurs when seeing one word ('doctor') leads to an increase in producing a different but related word ('nurse'). This is different than typical priming examples discussed previously, because here the concern is not whether previous exposure to 'doctor' will lead to faster identification of 'doctor' on a recognition task. Instead, the interest is in the associative relationship between words and concepts. Thus, the amount of priming produced is directly related to one's knowledge of the relationship between two or more items (McKoon & Ratcliff, 1992).

According to spreading activation theories, the success of this type of priming is based on the interconnected relationship between the two words (Anderson, 1983; Collins & Loftus, 1975; Meyer & Schvaneveldt, 1971; Quillian, 1967), such that 'doctor' will only lead to production or recognition of 'nurse' as a function of their previously associated memory traces. Thus, unrelated words (neutral or foil words; e.g., 'bread') would not be identified when 'doctor' is shown in the same way 'nurse' would be identified. The neutral or foil words would also not produce different response frequencies from one another when primed with 'doctor'.

According to non-spreading activation (e.g., compound cue) theories, associative priming is based on a matched cue search in memory (Dosher & Rosedale, 1989; Ratcliff & McKoon, 1988), such that the relationship between 'doctor' and 'nurse' is based primarily on the familiarity of the stimulus pair. By this account then, 'doctor' could arguably prime 'bread' if the 'doctor-bread' pairing was a frequently occurring, and thus familiar, cue. Therefore, it is more likely that neutral or foil words could be identified when primed with a stimulus word than they would according to spreading activation theories. Associative priming has been endorsed in both lexical decision and item recognition tasks, as well as in judgment of spatial locations (McNamara, 1992).

Associative priming extends beyond simple word identification. Priming participants with well-known information about a social group (e.g., trait, stereotype) has been shown to increase the likelihood of expressing related behaviors (Dijksterhuis & Bargh, 2001). In a classic study, Bargh, Chen, and Burrows (1996) primed participants with neutral words or with stereotypical words characteristic of elderly people (e.g., old, bingo). They found that participants who viewed the stereotypical words walked significantly slower when exiting the laboratory than those who viewed the neutral words, suggesting that the words activated associated information about elderly people (they walk slow) leading to behavior consistent with that information (to walk slowly themselves). Moreover, priming 'elderly' has also been shown to decrease performance on a memory task (Dijksterhuis, Aarts, Bargh, & van Knippenberg, 2000). Along a similar theoretical framework, priming 'politician' (versus a no prime condition) led participants to be more long-winded when constructing essays (Dijksterhuis & van Knippenberg, 2000), and priming 'professor' increased correct responses on a test of general knowledge (Dijksterhuis & van Knippenberg, 1998).

1.4 Religion

Recent research has demonstrated priming within the context of religious information (e.g., Wenger, 2003; Wenger & Daniels, 2006). Once accessed, this religious knowledge network has been shown to influence comprehension, memory for past events, and judgments. For example, Lipson (1983) found that children had greater comprehension of religious texts if they had prior knowledge of the information they were asked to read. Wenger (2003) primed religious participants with religious words (or nonwords), and then asked them to list the three greatest historical events. He found that participants listed more biblical events when primed with religious words. Using the Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998), other researchers have found implicit associations for religious (Wenger & Daniels, 2006), as well as moral concepts (Hoverd & Sibley, 2007).

These associations can be grounded in physical processes (e.g., vision, audition) and are in this sense embodied (McCauley & Whitehouse, 2005). Meier, Hauser, Robinson, Friesen, and Schjeldahl (2007) provided evidence for the embodiment of religious information when they found that metaphorical representations of God are associated with upward movement, and metaphorical representations of the devil are associated with downward movement. Other associations may represent habits (Miller, 2009) or rituals repeatedly performed, which then leads to a perseverance of both the associations themselves, as well as the contextual and emotional salience in which the original (and repeated) associations are performed (McCauley & Whitehouse, 2005). It follows then that if a person references images or icons of their faith, be it a cross on their necklace or a mezuzah in the doorway of their home, and reference it whenever they are facing a difficult life event, then the association between variable life circumstances and the teachings of their faith are strengthened.

Furthermore, the tendency to reach out towards one's faith must be learned initially, and would be the result of a recollective memory process whereby a person intentionally remembers that they are a spiritual person who engages in spiritual practices, and then applies them willfully. All of which require resources of attention (e.g., Jacoby & Dallas, 1981; Mandler, 1980). Over time, reaching towards one's faith may be the result of familiarity, such that repeated exposure to faith practices or rituals have created well-worn cognitive pathways related to the mechanics of the practice and to the situations in which engaging in that practice is applied. Thus, when a situation is encountered an automatic response of applying faith practices may follow. It follows then, that for a religious person, the automaticity of relying on one's faith does not require intention (i.e., attentional resources), and is strengthened by the frequency with which a person makes the association. Therefore, if a person can look to their faith under any circumstances, then every time they do so they are activating a network of stored information related to these teachings. **If religious beliefs influence the strength of associative nodes regarding religious information (i.e., religious-type information is more familiar for religious persons), then will religious pictures prime this network, and will this primed network influence general judgments (e.g., lexical decisions) as well as moral judgments?**

1.4.1 Religion and Morality

Memory necessitates the confines with which we regulate ourselves across contexts and communities (Miller, 2009). For example, identifying oneself as a helpful person requires one to have engaged in helping behavior in the past or to feel that helping behavior is a prescribed tenet of some belief system. Although religion is arguably a primary catalyst to moral identity formation (e.g., Winchester, 2008), the relationship between religion and morality is empirically tenuous. Religious concepts, as well as personal religiosity have been shown to influence social-

ly appropriate behavior in some studies, whereas others have found divergent evidence. Ahmed and Salas (2011) primed participants with religious words, and then had participants complete the dictator and prisoner's dilemma games. They found that priming with religious words increased generosity and cooperation across both tasks. Shariff and Norenzayan (2007) found that priming of God concepts influenced the amount of money participants left for an unknown stranger, suggesting that God concepts may refer to "moral actors" and therefore influence behavior. Randolph-Seng and Nielson (2007) found that priming participants with religious words negatively predicted cheating behavior in a prisoner's dilemma game, that is, they were less likely to cheat when primed with religious (versus sports or neutral) words. Thus, religious primes again promoted positive behavior, (i.e., honesty). Interestingly, these effects were not influenced by personal religiosity.

Kohlberg and Power (1981) argued that religion and morality were two independent constructs. Lombrozo (2009) had participants complete a moral commitments assessment followed by the trolley and footbridge problems. Consequentialist participants (i.e., those who evaluate the acceptability of a behavior based on real or imagined outcomes) judged moral dilemmas as more permissible than deontologist participants (i.e., those who focus on the behavior rather than the possible outcomes). These results were robust regardless of religiosity. Fumagalli, et al. (2010) similarly found that individual religiosity did not impact the reaction time or frequency of utilitarian judgments to moral situations. Conversely, religious beliefs in other studies have been found to influence general, as well as moral judgments. The influence of the disapproving Pope picture (Baldwin, et al., 1990) was only effective for participants who were active practicing Catholics, and the cardiovascular responses to negative religious pictures were only present for Christian (relative to non-Christian) participants (Weisbuch-Remington, et al., 2005). Cohen and

Rozin (2001) found that participants who self-identified as Protestant (rather than Jewish) were less accepting of a character in a scenario if the character's mental state was implicated in the moral rule violation. Morewedge and Clear (2008) found that Christian participants judged vignettes (which violated religious doctrine) more morally wrong when they affirmed a belief in the concept of an anthropomorphic God. Wahrman (1981) further found a moderated link between religion and morality, such that rigid adherence to religious doctrine resulted in lower moral judgment development. **As previous studies have found that picture symbols were representative of moral rules, such that these pictures primed moral decisions, the current experiments seek to further test the relationship between pictures and moral judgments using religious iconography.**

1.5 Overview of Studies

Overall, it is hypothesized that repeated associations between religious pictures and religious information facilitate their application to life circumstances, not only as contemplative tools, but arguably as proscriptive guides to decisions and behavior. Although the research is mixed as to whether religion informs morality at all, and if it does, then how it is informative – it is hypothesized that for religious persons, the repeated exposure to religious symbolism has created an interconnected network of religious information. Whereby anytime a religious symbol is seen, the full network of religious information becomes activated in memory, via spreading activation, and that this activated network influences one's moral judgments. Four experiments were conducted to explore this relationship.

In Studies 1 and 2, religious pictures (S1) versus religious words (S2) were tested as vehicles of activation for a network of religious information among religious (versus nonreligious) persons, with the prediction that activation will influence the speed of accurate word/non-word

identifications. To test this, in Study 1, participants were primed with religious or control pictures, and then completed a lexical decision task where words (religious, nonreligious) and nonwords were presented. Participants identified the true words from the nonwords. Accuracy and reaction time (RT) were recorded, and self-reported religiosity was assessed last. In Study 2, participants were primed with religious (versus control) words (half abstract, half concrete), and then completed a lexical decision task

For Study 1, It was hypothesized that religious *pictures* would prime religious information for religious persons via spreading activation of related nodes in memory. Accordingly, it was predicted that RT to accurate lexical decisions should be faster when identifying religious relative to nonreligious words after being primed with religious pictures. If personally held religious beliefs result in a heightened activation of religious information and thus influence decision making based on experienced semantic knowledge activation, then RTs should be faster for religious than nonreligious participants. For Study 2, and in line with the data cited from the imagery literature, the concrete religious words should lead to RT patterns similar to those observed in Study 1, as concrete words (which conjure a mental image of the object being described) are functionally similar to actually seeing the object. Abstract prime words should not do this. Abstract words were used as a control group, therefore no specific predictions are outlined. When comparing the priming effect of pictures (S1) versus words (S2), pictures should more efficiently prime related religious concepts than words, thereby leading to faster RT although the direction of the data pattern should be in similar, i.e., participants should have faster RTs to religious words when primed with religious pictures relative to each of the control groups.

In Studies 3 and 4, the influence of religious pictures (S3) versus religious words (S4) on moral judgments was tested. In Study 3, participants were primed with pictures (religious, con-

trol), similar to Study 1, and then they made moral judgments to short action phrases (morally right, morally wrong, morally ambiguous). In Study 4, participants were primed with words (religious, control), and then made moral judgments. Following predictions outlined in Studies 1 and 2, in Study 3 religious pictures should activate semantic religious information thereby influencing moral judgments to ambiguous action phrases, as these actions are necessarily uncertain without additional contextual information. If individual religious beliefs increase the strength of knowledge pathways due to repeated and frequent use, then for ambiguous phrases, religious (versus nonreligious) persons should rate ambiguous actions are less appropriate, because deciding to apply religious proscription of moral behavior will arguably dominate judgment deliberation. If belief systems do not matter, then religious and nonreligious participants alike should demonstrate a similar overall priming effect of religious pictures on moral judgments such that ratings of moral appropriateness should decrease relative to when a control picture is primed. Morally right and wrong action phrases should not be influenced by symbol type (pictures, words), prime type (religious, control) or participant religiosity (religious, nonreligious), because moral decisions to these actions should be relatively certain regardless of other factors.

In Study 4, concrete religious words should mirror the priming effect of religious pictures, i.e., moral ratings of appropriateness should be lower when primed with a religious (versus control) word, although when compared to the priming of pictures in Study 3, then the superiority of pictures should emerge. Moral judgments should be lower when primed with a religious picture versus a religious word.

2 PILOT STUDY – SELECTION OF PICTURES AND WORDS

2.1 Method

2.1.1 Participants

Undergraduate students at GSU (N=49) were recruited for this study using the GSU Psychology Research, Testing and Tutoring site (http://gsu.sona-systems.com). Participants self-identified their gender (41 female, 8 male), race (15 White, 25 Black, 9 other race), age (range 18-50 years), and religion (33 Christian, 8 other religion, 4 agnostic, 4 religion not identified). Students voluntarily participated for course credit.

2.1.2 Materials

Pictures. Religious pictures were taken from internet searches, and were reformatted for size and color consistency. Christian pictures (*n*=9) were included (e.g., crucifix, crown of thorns). Control pictures (*n*=13) were chosen as neutral comparisons to the religious pictures. They include punctuation and editing characters (e.g., asterisk, at sign). See Appendix A.

Words. A list of 59 religious words (conceptual and concrete) were derived, and assessed for character length and frequency (at wordplay.geneseo.org). Then, three nonreligious words were then selected based on their length and frequency match to each religious word (*n*=137). Legal nonwords were matched for length, and were adapted from McCann and Besner (1987). See Appendix B.

Religiosity[1].

Religious Fundamentalism Scale (RFS; Altemeyer & Hunsberger, 2004). The religious fundamentalism scale is a 12-item measure that assesses whether a person believes there is one fundamental set of teachings about the truths of humanity, as well as assessing one's relationship to deity. This measure has been shown to measure religious fundamentalism across faith traditions, and has high internal consistency (r=.80).

2.1.3 Procedure

Participants reviewed and signed consent forms, and then saw two blocks of materials (pictures, words) to be rated (blocks counterbalanced). Religious and nonreligious items were randomized within each block. Participants rated the degree to which each item is associated with religion/spirituality, how familiar the item is to them, and how positive/negative the item is (all Likert scales; 1=not at all, 7=very). Next, participants answered a series of questions related to their religiosity (see Materials), and then provided demographic information. Finally, participants were debriefed and awarded credit for participating.

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[1] Participant religiosity was also measured by assessing frequency of religious behavior (e.g., praying) via Religious Background and Behavior Scale (RBB; Connors, Tonigan, & Miller, 1996), and self-reported denomination (Christian, non-Christian). In all studies reported here, the influence of religiosity on decisions (lexical, moral) was also examined using these alternative assessments of religiosity, but neither religious behavior nor denomination yielded any significant influence on study outcomes therefore they are not discussed any further in the context of individual study results.

2.2 Results

Average ratings of religiosity, familiarity, and valence were calculated for each picture and word. As our participant sample was heavily Christian (67%), the five most spiritually-associated Christian pictures the five least spiritually-related control pictures were selected (see Appendix A). Pictures were equally familiar, M_{relig}=6.47, $M_{control}$=6.48, $t(8)$= -.01, p=.99, and equally valenced, M_{relig}=5.37, $M_{control}$=4.20, $t(8)$=2.01, p=.08, but religious pictures were rated as significantly more religious than control pictures, M_{relig}=6.08, $M_{nonrelig}$=1.60, $t(8)$=28.29, p<.01.

Sixty (20 religious, 20 nonreligious) words were selected for use in the experiments that follow (see Appendix B). Independent t-tests revealed that religious and nonreligious words do not differ along familiarity (M_{relig}=6.13, $M_{nonrelig}$=6.02, $t(38)$= -.87, p=.39) or valence (M_{relig}=5.78, $M_{nonrelig}$=5.61, $t(38)$= -.78, p=.44) dimensions. They only differ to the extent that they were rated as religious, M_{relig}=6.00, $M_{nonrelig}$=4.55, $t(38)$= -5.50, p<.01.

3 STUDY 1 – PICTURES AS SYMBOLS ON LEXICAL DECISIONS

Overall, it was hypothesized that religious pictures would prime a network of religious information, and that this should be more pronounced for religious persons. Several predictions follow. First, and as a manipulation check, participants should be significantly faster and more accurate at identifying words (religious and nonreligious) versus nonwords. Second, if religious beliefs matter in regard to spreading activation and subsequent decision making, then only religious participants should be faster than nonreligious participants to identify religious words when primed with a religious image. Third, nonreligious participants should respond with equivalent speed to both word types (religious, nonreligious) and picture prime (religious, control). Evidence for Prediction 2 would demonstrate that all words are equally familiar, and that

activation is contingent upon religious belief. Fourth, if religious beliefs are not influential, then there should be evidence of an overall priming effect of religious pictures on religious words, such that everyone identifies religious words faster than nonreligious words when primed with a religious versus control picture. Fifth, control pictures should not prime responses to either word type therefore RTs when primed with control pictures serve as a neutral control condition.

3.1 Method

3.1.1 Participants

Undergraduate students at GSU (N=102) were recruited for this study using the GSU Psychology Research, Testing and Tutoring site (http://gsu.sona-systems.com). Participants self-identified their gender (72 female, 27 male; 3 participants did not answer this question), race (23 White, 44 Black, 35 other race), age (range 18 - 54 years; *M*=23.69 years), and religion (51 Christian, 29 none/non-denominational, 10 other religion, 8 agnostic/atheist; 4 participants did not answer this question). Students voluntarily participated for course credit.

3.1.2 Materials

Pictures. See Materials; Pilot Study. See also Appendix A.

Words. See Materials; Pilot Study. See also Appendix B.

Religiosity. See Materials; Pilot Study.

3.1.3 Procedure

After reviewing and signing consent forms participants completed a task consisting of two alternating goals, 1) attending to a presented picture on the computer screen, and 2) determining whether a string of letters formed a word or not (lexical decision task; Meyer & Schvaneveldt, 1971). Religious or control pictures were presented in randomized block format.

Each block consisted of 30 trials, and each trial began with a picture (e.g., religious: crucifix) being shown first, followed by a letter string that formed a religious or nonreligious word or a nonword. They were told to identify whether the letter string was a "word" or a "nonword" (via key press) as quickly and accurately as possible.

A fixation point (+) was shown in the middle of the screen (300ms), followed by an image (50ms). Then a randomly presented letter string appeared and remained on the screen until a word/nonword decision was made. The trial ended with an interstimulus interval (ISI; 300ms). There were five pictures used in each picture prime condition (religious, control), and each picture was shown 6 times for a total of 30 trials in each block. The 30 trials included 10 religious words, 10 nonreligious words, 10 nonwords.

Once all trials were completed participants were asked to write down all pictures they remembered seeing. Then they answered a series of questions related to their religiosity (see Materials; Pilot Study), and they identified what they thought the experimental hypothesis was. Finally, participants were debriefed and awarded credit for participating.

3.2 Results

3.2.1 Design

An overall 2x2x2 [Participant Religiosity: religious, nonreligious x Picture Prime: religious, control x Word Type: religious, nonreligious] mixed-subjects model was used. Participant Religiosity was a between-groups variable, whereas Word Type and Picture Prime were within-subjects. The dependent variable was average RT to accurate lexical decisions.

3.2.2 Items Analysis

The presence of outliers was evaluated by conducting items analyses of picture primes and words using average accuracy and reaction times as dependent measures. Pictures or words falling outside two standard deviations around the mean for accuracy or reaction time (RT) were removed from the analyses that follow. One control picture, six nonwords, and one nonreligious word were removed. Participant outliers were also evaluated by examining accuracy and RT collapsed across the other IVs, but none were found consistently to fall outside the two standard deviation boundary for accuracy or RT. The analyses that follow were all conducted with all outliers removed.

3.2.3 Data Preparation

Next, average RTs (accurate lexical decision) were calculated for each Word Type x Picture Prime. Then, RFS scores were calculated for each participant. Of the 12 items on RFS, half were reverse-scored. The regular- and reverse-scored items were added up separately, then the sum of the reverse items was subtracted from the sum of regular items giving each person an RFS final score (range: -48 to 48). Participants with scores below zero were coded as nonreligious (n=50), those above zero were coded as religious (n=48), and those with scores of zero were not used in the analyses that follow (n=4).

3.2.4 Manipulation Check

Average accuracy was calculated for each word type (collapsed across all other variables), and then compared using a repeated-measures ANOVA, $F(2,194)=18.92$, $p<.01$, $\eta_p^2=.18$. Consistent with Prediction 1, lexical decisions were significantly greater for religious (M=.97) and nonreligious words (M=.97) relative to nonwords (M=.92), ps<.01. Overall, participants made highly accurate lexical decisions, and were accurate across conditions.

3.2.5 Primary Analyses

A 2x2x2 [Participant Religiosity: religious, nonreligious x Picture Prime: religious, control x Word Type: religious, nonreligious] mixed-subjects ANOVA was conducted. The dependent variable was average RT to accurate lexical decisions. A significant main effect of Word Type emerged, wherein participants were significantly faster to accurately identify religious (M=952.21 ms) than nonreligious (M=1034.30 ms) words, $F(1,96)=21.37$, $p<.01$, $\eta_p^2=.18$. There was a significant Picture Prime x Word Type interaction as well, $F(1,96)=8.55$, $p<.01$, $\eta_p^2=.08$. Participants were faster to correctly identify a religious than nonreligious word when primed with a religious picture, $t(97)= -5.13$, $p<.01$. The remaining pairwise comparisons were not significant, ps >.05. See Figure 1.

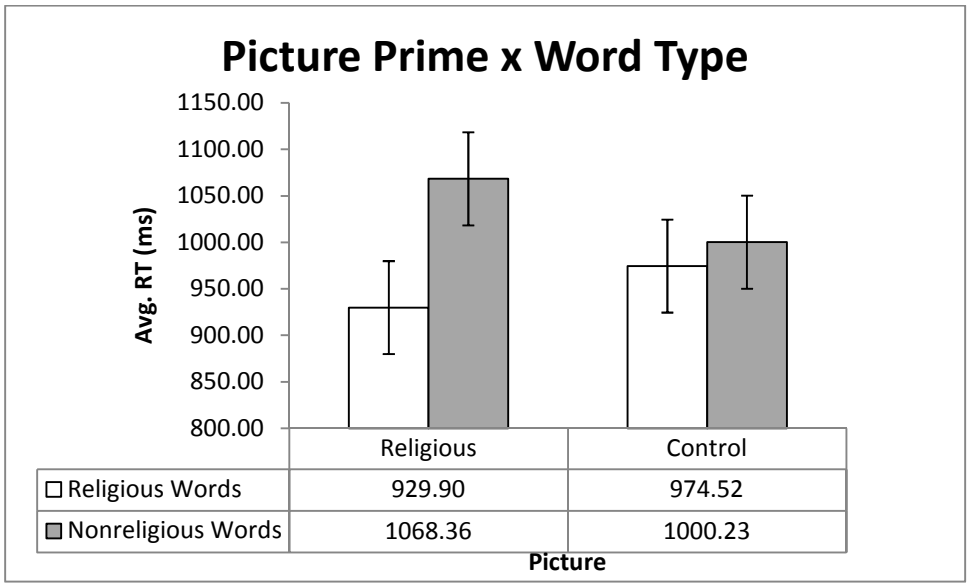

Figure 1. (Study 1) Picture Prime x Word Type interaction on average RT to accurate lexical decisions. Error bars represent standard error.

3.2.1 Follow-up Analyses

According to spreading activation theories (Collins & Loftus, 1975), RT to lexical decisions should be faster at the end of the religious picture block than at the beginning. Follow-up analyses confirm this expectation. Paired-samples t-tests were conducted to determine if there was activation build-up such that religious words at the end of the lexical task were identified faster than those at the beginning of the task. For religious pictures, there was a significant decrease in RT for the last religious word (M=843.06 ms) versus the first religious word (M=1028.26 ms) presented, $t(96)=3.00$, $p<.01$. This did not occur for control pictures. The first and last religious word presented were identified equally as fast, $p=.29$.

3.3 Discussion

The intention for Study 1 was to determine whether religious pictures prime religious information in semantic memory, and furthermore whether this priming effect would be evident in all persons or only for participants with personally espoused religious beliefs. The results supported Predictions 1 and 4. Overall, participants (regardless of religious beliefs) were significantly faster to make accurate lexical decisions to religious words than nonreligious words. This suggests that religious words are salient rather than simply familiar, as religious and nonreligious words were pre-tested and found to be equally familiar. Participants were also significantly faster to identify religious than nonreligious words when primed with religious pictures

First, these data demonstrate that religious words are salient to all persons possibly because over half the sample (60%) identified belonging to some faith tradition, and because the sample was gathered in the geographic ‘bible belt’ where Christian-based visual stimuli (e.g., churches, billboards) are common. Second, spreading activation via picture presentation (as confirmed by follow-up analyses) influenced decision making. Third, spreading activation from re-

ligious pictures to religious information is ubiquitous as self-reported religious belief did not impact lexical decisions. This might have occurred because religious pictures and associated words are culturally ingrained, thus these semantic connections are developed for everyone living here in the south. Furthermore, lexical decisions do not have a proscribed response based on religiosity, therefore even if activated with a religious picture; a person's own belief system may not guide decisions under these circumstances.

4 STUDY 2 – WORDS AS SYMBOLS ON LEXICAL DECISIONS

In Study 2, concrete words were tested as primes to determine whether they had a comparable or uniquely different influence than pictures on lexical decisions. The imagery literature has demonstrated that when words are concrete (i.e., verbal labels of a physical object), then they encourage the same effect on an outcome (e.g., learning, memory) as if the object itself had been shown. In the current study, participants completed the same priming and lexical decision trials as was conducted in Study 1, except that prime stimuli were no longer pictures, but were words that represented concrete objects. As previous experiments have demonstrated that religious words prime religious outcomes (e.g., Wenger, 2003), religious words should similarly demonstrate a priming effect here on lexical decisions. However, pictures are predicted to serve a unique priming role as it has been found that RTs are fastest when a superordinate category (or concept) versus a related link in the semantic network is primed (Collins & Loftus, 1975). Thus, when compared to the data from Study 1, RTs to lexical decisions when primed with a concrete religious word should be slower. There should be no difference in RTs as a result of concrete control words.

4.1 Method

4.1.1 Participants

Undergraduate students at GSU (N=104) were recruited for this study using the GSU Psychology Research, Testing and Tutoring site (http://gsu.sona-systems.com). Participants self-identified their gender (90 female, 14 male), race (22 White, 49 Black, 31 other race, 2 unknown), age (range 18 - 31 years; *M*=19.51 years), and religion (69 Christian, 17 none/non-denominational, 13 other religion, 5 agnostic/atheist). Students voluntarily participated for course credit.

4.1.2 Materials

Word Primes. Sixty words or phrases (30 religious, 30 control; half of each concrete vs. abstract) were selected. Ten of these were the verbal labels for pictures used in Study 1 (e.g., "crucifix", "dove of peace", "crown of thorns"). The remaining words were pretested to be highly religious (or not) – half of which were associated with a picture image (e.g., church, heaven, disciple).

Words (Lexical Decision Task). See Materials; Pilot Study. See also Appendix C.

Religiosity. See Materials; Pilot Study.

4.1.3 Procedure

Participants followed the procedure conducted in Study 1 with the exception that words (religious, control) were used as the priming stimuli rather than pictures.

4.2 Results

4.2.1 Items Analysis

The presence of outliers was evaluated following criteria outlined in Study 1 (i.e., average RT and accuracy calculated for word primes, words used in the lexical task, and for each participant). Three control word primes, one religious word prime, five nonwords, and three participants were identified and removed from the dataset as they were beyond two standard deviations of the mean. The analyses that follow were conducted with all outliers removed.

4.2.2 Data Preparation

First, average RTs were calculated for each Word Prime x Concreteness x Word Type. Then, RFS scores were calculated for each participant (see Results; Study 1). Those with a score below zero were coded nonreligious (n=45), those with a score above zero were coded religious (n=55), and those with a score of zero (n=1) were not included in the analyses that follow.

4.2.3 Manipulation Check

Average accuracy was calculated for each word type (collapsed across all other variables), and then compared using a repeated-measures ANOVA, $F(2,200)=41.55$, $p<.01$, $\eta_p^2=.29$. Accurate lexical decisions were significantly greater for religious (M=.98) and nonreligious words (M=.98) relative to nonwords (M=.85), ps<.01. Consistent with Study 1, participants made highly accurate lexical decisions overall, and across conditions.

4.2.4 Primary Analyses

First, a 2x2x2 [Participant Religiosity: religious, nonreligious x Word Prime (*concrete only*): religious, control x Word Type: religious, nonreligious] mixed-subjects ANOVA was conducted on accurate lexical decisions. Similar to Study 1, a two-way interaction of Word

Prime x Word Type emerged as significant, $F(1,98)=3.93$, $p=.05$, $\eta_p^2=.04$; however, the direction of means was not consistent with predictions (see Figure 2). All participants were significantly faster to identify religious words when primed with a concrete control word than with a concrete religious word, $t(100)=2.22$, $p=.03$. No other pairwise comparisons were significant. Although not predicted, concrete religious word primes resulted in longer RTs to religious words relative to control word primes.

Although previous research has demonstrated that conjuring an image associated with its verbal label takes time, thereby increasing RT (Paivio & O'Neill, 1970; Paivio & Csapo, 1969), this would not explain why concrete control words led to significantly faster priming of religious words. The control words should have also conjured a mental image, requiring time to do so, just like the concrete religious words. Therefore, priming should have occurred and in the expected direction unless priming did not occur from the presentation of concrete word primes. To check this, paired samples t-tests were conducted to compare RT from the first to the last religious words identified in both the religious and control prime blocks. For concrete religious word primes, RT decreased from the first to the last word confirming that spreading activation occurred from both religious word primes (M_{first}=1182.29 ms, M_{last}=1024.78 ms, $t(97)=2.07$, $p=.04$). When control words were primed, there was no change in RT from the first to last religious words, which suggests that concrete control word primes did not prime religious information.

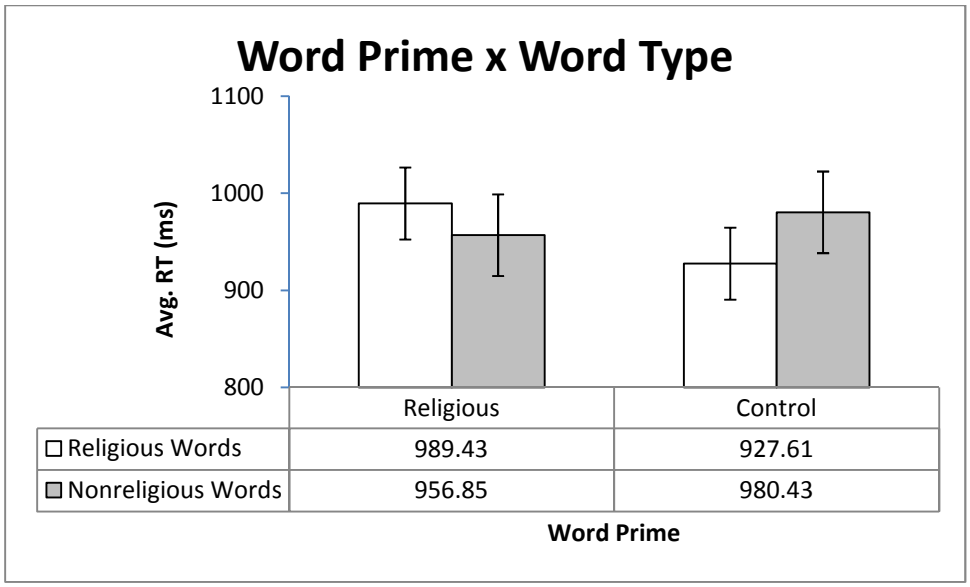

Figure 2. (Study 2) Word Prime (*concrete*) x Word Type interaction on average RT to accurate lexical decisions. Error bars represent standard error.

To examine the absence of religious priming via concrete words, a 2x2x2 [Participant Religiosity: religious, nonreligious x Word Prime (*abstract*): religious, control x Word Type: religious, nonreligious] mixed-subjects ANOVA was conducted on accurate lexical decisions. Here, the word primes were abstract, such that they were not readily associated with a physical object or picture, therefore they should not conjure a mental image when presented. If the argument that concrete words take time to conjure images is evidenced, then abstract religious words should demonstrate the priming effect originally predicted for concrete words, meaning that there should be general priming from abstract religious words to lexical decisions of religious words. A main effect of Word Symbol emerged, such that lexical decisions took significantly longer when primed with religious words (M=1033.03 ms) than nonreligious words (M=950.93 ms), $F(1,98)=6.65$, $p=.01$, $\eta_p^2=.06$. A two-way interaction of Word Prime (*abstract*) x Word Type emerged, $F(1,98)=20.63$, $p<.01$, $\eta_p^2=.17$, see Figure 4. Participants were faster to identify

religious versus nonreligious words when primed with abstract religious words, $t(100)= -3.95$, $p<.01$, and slower to identify religious versus nonreligious words when primed with abstract control words, $t(100)=2.91$, $p=.01$. Participants were also significantly slower to identify nonreligious words when primed with religious versus control words, $t(100)=5.35$, $p<.01$.

Paired samples t-tests were conducted to compare RT from the first to the last religious words identified in both the religious and control prime blocks. Similar to the concrete word primes, for abstract religious word primes, RT decreased from the first to the last word confirming that spreading activation occurred from both religious word primes (M_{first}=1001.36, M_{last}=805.44, $t(99)=4.83$, $p<.01$). Moreover, when compared across prime type, abstract religious words primed religious words faster than concrete religious words at the beginning, $t(99)=2.46$, $p=.02$, and end of the task, $t(97)=5.95$, $p<.01$. Once again, when control words were the prime, there was no change in RT from the first to last religious words.

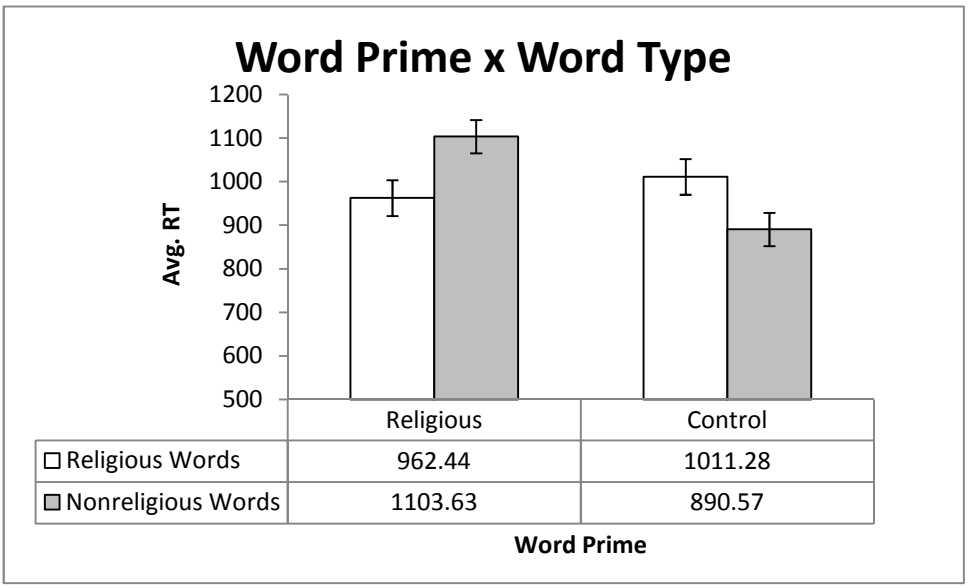

Figure 3. (Study 2) Word Prime (*abstract*) x Word Type interaction on average RT to accurate lexical decisions. Error bars represent standard error.

To examine the unique effect of religious pictures versus concrete religious words on accurate lexical decisions, a 2x2 [Prime: religious pictures (S1), concrete religious words (S2) x Word Type: religious, nonreligious] mixed-subjects ANOVA was conducted. First, a main effect of Word Type emerged, $F(1,196)=7.26$, $p=.01$, $\eta_p^2=.04$. Consistent with Study 1, participants were faster to identify religious (M=962.69 ms) than nonreligious (M=1013.72 ms) words. Second, there was a two-way interaction of Prime x Word Type, $F(1,196)=20.70$, $p<.01$, $\eta_p^2=.10$, see Figure 3. Participants were significantly faster to identify religious versus nonreligious words when primed with a religious picture, $t(97)= -5.13$, $p<.01$. There was no effect of concrete religious word primes on RT, $p=.19$. Unexpectedly, RT did not differ based on Prime Type to either religious ($p=.30$) or nonreligious words ($p=.12$).

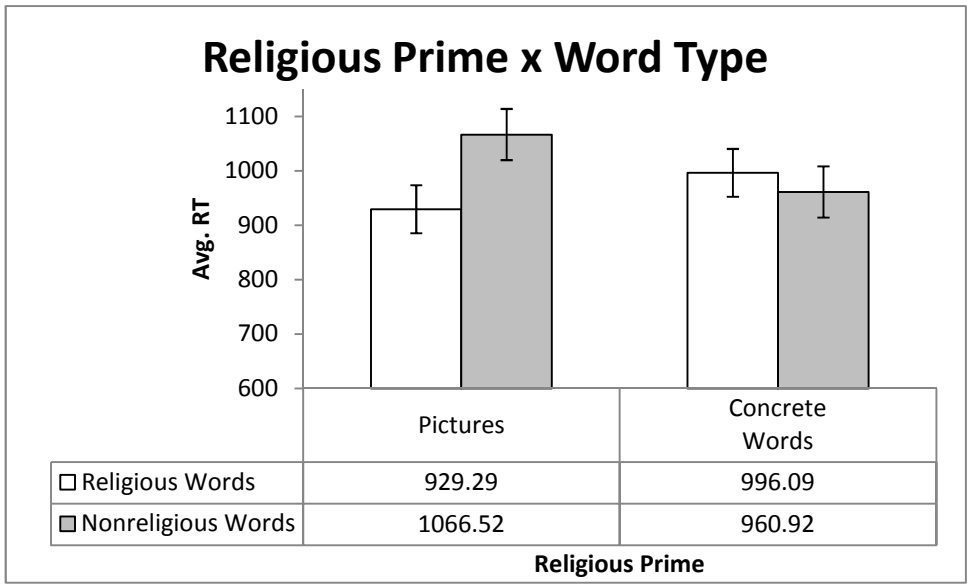

Figure 4. (Study 2) Religious Prime x Word Type interaction on average RT to accurate lexical decisions. Error bars represent standard error.

4.3 Discussion

As concrete words arguably conjure a mental image of the object they represent, Study 2 tested whether concrete religious words would influence lexical decisions in a similar fashion to what was found in Study 1 where actual pictures were used as primes. Prediction 1 was not supported. Participants took longer to identify religious words when primed with concrete religious (versus control) words - possibly suggesting that conjuring the mental image of a neutral concrete word occurs efficiently, whereas the same process for religious concrete words takes more time. This could possibly occur because the concrete religious words are associated with verbatim memory traces (memories that involving conscious recollection; Reyna & Brainerd, 1995) which may become activated along with other conceptual religious information. Sifting through the contextual details of these memory traces may require more time to reach a decision on the lexical task at hand relative to when a concrete word conjures a neutral image with no associated verbatim traces.

When RT was compared between Studies 1 and 2, partial support was found for the prediction that religious pictures would prime related religious information faster than religious words. Participants were faster to identify religious (versus nonreligious) words when primed with a religious picture, but not when primed with concrete religious words. However, there was no difference in RT to religious words when primed with religious pictures versus concrete religious words. Potentially, both pictures and concrete words (having conjured mental images) prime verbatim memory traces equally, which is why there is no difference in RT to religious words when picture versus concrete word primes are compared; however, because pictures encouraged faster RTs to religious than nonreligious words (whereas concrete religious word primes did not) this suggests that the visuo-spatial modality primarily employed via picture prim-

ing resulted in quicker lexical decisions for the activated stimuli. This is consistent with expectations via the picture superiority effect. Because concrete words led to equal RT to religious and nonreligious words it is possible that the dual activation of visuo-spatial and phonological modalities resulted in an unexpected taxing of cognitive resources rendering priming across word type stimuli inconclusive.

Additional possible explanations for the inconsistency in predictions and outcomes may come from limitations among the word stimuli. Bleasdale (1987) suggested that different word types, from prime to target, could impact RT to the dependent task. For example, concrete-concrete and abstract-abstract word pairs lead to faster RT than mismatched (e.g., concrete-abstract) pairs. In Study 2, all of the lexical task words were abstract, whereas half the prime words were concrete and half were abstract. This may account for some of the inconsistencies between predictions and outcomes; however, limitations within the experimental stimuli prevent full consideration of alternative theoretical accounts to explain these unexpected data. These limitations include the prime words being subjectively selected and sorted into concrete and abstract categories by the experimenter. Although all words were pre-tested for valence, familiarity, and spiritual-relatedness, they were not assessed for concreteness or imagability. It is possible that concrete words were not as concrete, and abstract words not as abstract as they appeared. Similarly, it may be that the differences between the two word types were not statistically significant.

In sum, these data demonstrate that religious pictures prime religious information by activating related pathways that speeds RT to religious versus nonreligious words. Although follow-up analyses of concrete religious word primes also demonstrated a priming effect on religious words throughout the duration of the religious priming block, the predicted comparisons

between prime and word type (i.e., concrete religious words should prime lexical decisions to religious words) did not emerge. Whereas previous studies found that concrete words influenced outcomes (e.g., memory for word pairs) similar to that of actual pictures, the current data do not support this finding. Limitations related to the priming stimuli may prevent the comparable influence of pictures versus concrete words from being fully assessed. Religious words do prime related religious words, but potentially the process to go from concrete word to mental image to lexical word identification (in Study 2) takes longer than to go from picture to lexical word identification (in Study 1). Thus, the effect of priming with concrete words was eliminated due to this multi-step process resulting in pictures as primes having an advantage relative to concrete words in concept activation relative to concrete words.

5 STUDY 3 – PICTURES AS SYMBOLS ON MORAL JUDGMENTS

The motivation for Study 3 was such that the semantic pathway activation demonstrated in lexical decisions from Study 1 should then translate into moral judgments here in Study 3. The primary prediction was that religious pictures should prime semantic religious information which should then influence decisions in morally ambiguous action phrases. Although Studies 1 and 2 did not find any effect of participant religiosity on decisions, the decisions being made were nonmoral. In Study 3, however, the primary task requires participants to decide the moral appropriateness of a stated behavior. As faith-based guidelines are a reference for religious persons when deciding how to act or what decision to make (e.g., “thou shalt not” type proscriptions), if religious beliefs were to influence decision making, it would be most likely when making a moral decision, and when primed with a religious picture. Thus, for a religious person, seeing a religious picture might prime known behavioral expectations of one’s faith, thus leading to

a decrease in ratings of moral appropriateness. If the effect of religious pictures is specific to *moral* decision making (versus other kinds of decisions, e.g., lexical), then nonreligious participants should not be influenced by the type of picture prime.

5.1 Method

5.1.1 Participants

Undergraduate students at GSU (N=102) were recruited for this study using the GSU Psychology Research, Testing and Tutoring site (http://gsu.sona-systems.com). Participants self-identified their gender (72 female, 27 male, 3 participants did not answer this question), race (23 White, 44 Black, 35 other race), age (range 18 - 54 years; *M*=23.69 years), and religion (51 Christian, 29 none/non-denominational, 10 other religion, 8 agnostic/atheist, 4 participants did not answer this question). Students voluntarily participated for course credit.

5.1.2 Materials

Pictures. See Materials; Pilot Study. See also Appendix A.

Religiosity. See Materials; Pilot Study.

Action Phrases. Phrases were created based on the five themes of Moral Foundations Theory (Haidt & Joseph, 2004): sanctity/degradation, fairness/cheating, loyalty/betrayal, care/harm, authority/subversion. Three examples were created for each of the five moral themes (*n*=15), and three versions of each phrase were created to reflect three categories of moral appropriateness (right, ambiguous, wrong) (*n*=45). See Appendix D for a list of all phrases used.

Phrases were then pre-tested by a panel of naïve raters (*n*=9), who viewed each phrase, and decided as quickly as possible if the behavior was right/wrong (Likert scale, 1= morally wrong, 7= morally right) as quickly as possible, and then rated how confident they were in their

decision (Likert scale: 1=not at all confident, 7=completely confident). Average moral rating, average RT to moral ratings, and average confidence were calculated for each moral category (right, ambiguous, wrong). Then three univariate ANOVAs were conducted with moral category as the independent variable. First, average moral rating was examined, and was found to be significant with differences in the expected directions, $F(2,16)=142.54$, $\eta_p^2=.95$, $p<.001$, Phrases: $M_{right}=5.99$, $M_{ambig}=3.53$, $M_{wrong}=2.08$. All pairwise comparison were significant, ps<.001. Morally right phrases were rated as most appropriate, morally wrong phrases were rates are least appropriate, and morally ambiguous phrases were rated in between the right and wrong phrases.

Next, average RT to moral ratings were compared, and found to be significant, $F(2,16)=21.79$, $\eta_p^2=.73$, $p<.001$, Phrases: $M_{right}=4601.65$ ms, $M_{ambig}=6014.17$ ms, $M_{wrong}=4964.35$ ms. RT to the right and wrong phrases were significantly faster than to the ambiguous phrases, ps<.01, but RT to right and wrong phrases were not significantly different from one another, $p=.11$. Finally, ratings of confidence were compared, and the differences between ratings emerged significant as well, $F(2,16)=13.66$, $\eta_p^2=.63$, $p<.001$, Phrases: $M_{right}=6.70$, $M_{ambig}=5.74$, $M_{wrong}=6.30$. Participants were significantly more confident to the right than the wrong ($p=.05$) phrases, and least confident to the ambiguous phrases. All pairwise comparisons were significant.

5.1.3 Procedure

After reviewing and signing consent forms participants were presented with picture primes (religious, control) as described in Study 1. After a picture was displayed, an action phrase (right, ambiguous, wrong) appeared and remained on screen until a moral decision (Likert scale: 1=morally wrong, 7=morally right) was made. Participants were instructed to respond as quickly as possible. Alternating pictures and action phrases were presented in two blocks, one

block for each picture prime (religious, control). A total of fifteen trials (5 right, 5, ambiguous, 5 wrong) were completed in each block, and each of the five (religious, control) pictures were shown three times in each block. Trials were randomized. Next, participants answered a series of questions related to their religiosity, and identified what they thought the experimental hypothesis to be. Finally, participants were debriefed and awarded credit for participating.

5.2 Results

5.2.1 Manipulation Check

Average Likert scale rating was calculated for each moral category (right, ambiguous, wrong). Then a repeated measures ANOVA was conducted to confirm the pilot data previously reported. The effect was significant, $F(2,194)=1134.56$, $p<.01$, $\eta_p^2=.92$. Overall, ratings of moral appropriateness were highest when morally right phrases ($M=6.41$) were shown versus morally ambiguous ($M=3.74$) or wrong ($M=2.24$) phrases. All pairwise comparisons were significant, ps<.001.

5.2.2 Data Preparation

RFS scores were calculated for each participant. Those with a score below zero were coded nonreligious ($n=50$), those with a score above zero were coded religious ($n=48$), and those with a score of zero ($n=4$) were not included in the analyses that follow. Average Likert scale rating was then calculated for each moral category (right, ambiguous, wrong) by each picture prime (religious, control).

5.2.3 Primary Analyses

As there were a priori expectations specifically for ambiguous phrases, a 2x2 [Participants Religiosity: religious, nonreligious x Picture Prime: religious, control] mixed-subjects

ANOVA was conducted on average rating of moral appropriateness to ambiguous action phrases only. A main effect of Picture Prime emerged, $F(1,96)=5.52$, $p=.02$, $\eta_p^2=.05$. Participants provided lower ratings of moral appropriateness when primed with a religious ($M=3.81$) than control ($M=4.09$) picture. A two-way Participant Religiosity x Picture Prime interaction was also significant, $F(1,96)=4.17$, $p=.04$, $\eta_p^2=.04$, see Figure 5. Religious participants provided lower moral ratings when primed with a religious than control picture, $t(47)= -2.91$, $p=01$. No other pairwise comparisons were significant.

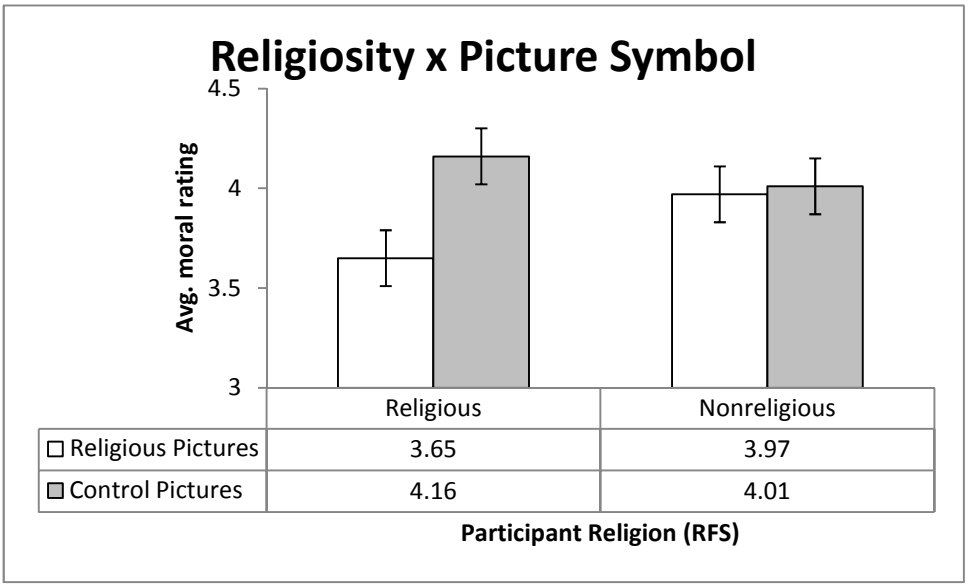

Figure 5. (Study 3) Participant Religiosity x Picture Prime interaction on average rating of moral appropriateness to ambiguous action phrases. Error bars represent standard error.

5.3 Discussion

In Study 3, it was predicted that religious pictures would influence moral judgments primarily for religious participants, and the current data support this expectation. When judging morally ambiguous actions, ratings of moral appropriateness decreased when primed with religious (relative to control) pictures. This effect occurred for everyone regardless of self-reported religious beliefs. However, when the influence on Picture Prime was examined in conjunction

with personal religiosity, then only the religious participants displayed this pattern. These data suggest that uncertain, or ambiguous, circumstances led to a reliance of known faith-based tenets of behavior (e.g., "thou shalt not"), but only when religious information was activated via Picture Prime. Although Studies 1 and 2 did not find any influence of participant religiosity on decision making, the current data suggest that applying religion beliefs during decision deliberation emerges when considering moral situations.

6 STUDY 4 – WORDS AS SYMBOLS ON MORAL JUDGMENTS

The intent of Study 4 was to determine whether priming with religious words would influence moral judgments in the same direction as religious picture primes did in Study 3. Here, concrete religious words were used (see Study 2), and moral assessments were made on morally right, ambiguous, and wrong action phrases (see Study 3).

6.1 Method

6.1.1 Participants

Undergraduate students at GSU (N=104) were recruited for this study using the GSU Psychology Research, Testing and Tutoring site (http://gsu.sona-systems.com). Participants self-identified their gender (90 female, 14 male), race (22 White, 49 Black, 31 other race, 2 unknown), age (range 18 - 31 years; *M*=19.51 years), and religion (69 Christian, 17 none/non-denominational, 13 other religion, 5 agnostic/atheist). Students voluntarily participated for course credit.

6.1.2 Materials

Word Primes. See Materials; Study 3. See also Appendix C.

Religiosity. See Materials; Pilot Study.

Action Phrases. See Materials; Study 3. See also Appendix D.

6.1.3 Procedure

Participants followed the procedure conducted in Study 2 with the exception that words (religious, control; concrete, abstract) were used as the priming stimuli rather than pictures.

6.2 Results

6.2.1 Manipulation Check

Average Likert scale rating was calculated for each moral category (right, ambiguous, wrong). Then a repeated measures ANOVA was conducted to confirm the pilot data reported in Study 3. The difference was significant, $F(2,206)=872.19$, $p<.01$, $\eta_p^2=.89$. Overall, ratings of moral appropriateness were highest when morally right phrases ($M=6.35$) were shown versus morally ambiguous ($M=3.77$) and wrong ($M=2.35$) phrases. All pairwise comparisons were significant, ps<.001.

6.2.2 Data Preparation

RFS scores were calculated for each participant. Those with a score below zero were coded nonreligious ($n=58$), those with a score above zero were coded religious ($n=45$), and those with a score of zero ($n=1$) were not included in the analyses that follow. Average Likert scale ratings for word primes (religious, concrete) were calculated for ambiguous phrases only.

6.2.3 Primary Analyses

A 2x2 [Word Prime (*concrete*): religious, control x Participant Religiosity: religious, nonreligious] mixed subjects ANOVA was conducted on ambiguous action phrases only. Only a main effect of Word Prime was significant, $F(1,101)=8.00$, $p=.01$, $\eta_p^2=.07$, such that concrete

religious words encouraged lower ratings of moral appropriateness (M=3.97) relative to concrete control words (M=4.38) for everyone, independent of personal religiosity. No other differences were found to be significant.

Finally, to determine the unique influence of religious pictures on moral decision making, a 2x2x2 [Symbol: pictures (S3), concrete words (S4) x Prime: religious, control x Participants Religiosity: religious, nonreligious] mixed subjects ANOVA was run on ambiguous action phrases. A significant main effect of Prime emerged, $F(1,197)=13.39$, $p<.01$, $\eta_p^2=.06$. Participants provided lower moral ratings when primed with a religious (M=3.89) than a control (M=4.23) symbol. Furthermore, there was a trending main effect of Symbol, $F(1,197)=3.59$, $p=.06$, $\eta_p^2=.02$, such that the religious pictures from Study 3 (M=3.95) encouraged lower moral ratings than religious words from Study 4 (M=4.18).

6.3 Discussion

The purpose of Study 4 was to determine whether religious words would elicit a priming effect when deliberating on an uncertain situation, thus leading to lower ratings of moral appropriateness, and further to examine whether this effect was more pronounced for religious than nonreligious participants. These predictions were supported by the data in Study 3, and were only partially supported in Study 4. In the current study, there was significant priming effect of religious (relative to control) words, whereby ratings of moral appropriateness to ambiguous actions dropped when primed with a religious word. Unlike Study 3, this effect was independent of participant religiosity. Moreover, when Studies 3 and 4 were compared, two effects emerged. First, any religious symbol (picture or word) primed moral decisions – that is, ratings were lower when primed with a religious than a control symbol. Second, religious pictures encouraged low-

er ratings in moral decisions that religious words. Once again, these effects were independent of participant religiosity.

Unlike Study 3 where religious (versus control) pictures encouraged lower ratings of moral appropriateness for religious participants, Study 4 provides further evidence for a general priming influence of religious symbols, regardless of individual religious beliefs (as demonstrated in Studies 1 and 2). That differences in moral decisions as a function of individual religiosity only became evident when comparing religious to control pictures (in Study 3) may speak to the salience of the pictures themselves, as well as to the nature of pictures as symbols - meaning that images do not represent one individual idea or tenet, but rather are symbolic of multiple related facets, thus leading to a more pronounced priming effect than words alone.

7 GENERAL DISCUSSION

7.1 Review of experimental findings

Four experiments were used to examine the distinct influence of religious pictures on decision making. In Study 1, participants viewed religious and neutral (control) pictures, and then made a series of lexical decisions. In Study 2, participants viewed religious and neutral words (which represented the pictures viewed in Study 1), and then made lexical decisions. In Studies 3 and 4, participants made decisions about moral actions. Moral decisions were preceded by viewing pictures in Study 3, and by words in Study 4. It was overall hypothesized that religious pictures would encourage a priming effect, via spreading activation, on decision making (lexical, moral) relative to when control pictures were presented, and relative to when religious words were presented. Partial support for this hypothesis was found. In Study 1, all participants made faster lexical decisions to religious words when primed with a religious picture. In Study 2, ab-

stract (but not concrete) religious words primed lexical decisions to religious items in the predicted direction. It was further anticipated that individual religious beliefs would interact with the type of symbol presented, thus influencing decision making. Support for this prediction was only demonstrated for moral decisions in Study 3, whereas highly religious participants rated ambiguous actions as less morally appropriate when primed with a religious versus control picture. However, in Study 4, the effect of participant religiosity did not emerge when primed with religious words. Instead, there was an overall tendency to make lower moral ratings when primed with a religious versus control word, and lower ratings when primed with a religious picture versus a religious word. That these effects emerged for everyone, and not as a function of participant religiosity suggests the pervasiveness of religious knowledge, and its influence on decision making.

Thus, it can be concluded that religious iconography consistently primes religious information, thereby leading to quick and accurate decision making. Furthermore, when presented with a moral situation, religious pictures (presumably having primed semantically related religious information) encourage decisions consistent with known faith-based tenets. This interactive effect is most influential when individual religious beliefs are held.

7.2 Moral Decision Making

7.2.1 Religion

As our memory is adaptive (such that non-useful information is often forgotten or discarded), but also fallible (such that necessary information may not be accessible; Schacter, 1999), religious pictures cue stored semantic knowledge of religion, which includes expectations of normative behavior (Guthrie, 1996). Indeed, when participants in the current set of studies saw religious pictures they adjusted moral judgments in line with religious expectations of mo-

rality. Other studies looking at the influence of religious pictures have used pictures of the Pope, Christ, or a demon, and found that presentation of those pictures influence physiological responses (Weisbuch-Remington, et al., 2005), and perceptions of self (Baldwin, et al., 1990), but none have directly looked at how religious pictures influence decision making, and specifically moral decision making.

Previous researchers who examined the relationship between religion and morality have primarily used word as primes. For example, priming with religious words has been found to increase generosity and cooperation (Ahmed & Salas, 2011; Shariff & Norenzana, 2007) and increase honesty in a cheating task (Randolph-Seng & Nielsen, 2007). In the current studies, priming with religious words increased access to related religious information (evidenced by faster RT; Study 2, but only for abstract primes), and led to decreased assessments of moral appropriateness of ambiguous actions (Study 4). Future studies could examine if the influence of religious pictures versus words would extend beyond decision making and onto a specific moral behavior.

7.2.2 Religious Beliefs

Although some previous demonstrations of religious priming on moral outcomes have found individual religious beliefs influential (e.g., Cohen & Rozin, 2001), others have not (e.g., Lombrozo, 2009). The current studies offer support for both sides of this debate. In Study 3, moral appropriateness dropped when religious pictures were shown. Although this was demonstrated regardless of individual religiosity it was amplified for religious participants. However, in Study 4, when words were used as primes, the effect of religious versus control primes were consistently influential on moral decisions, but the moderating impact of personal religiosity was not replicated from the previous experiment.

According to the literature, two factors appear prominent when cataloguing the effect of religiosity: type of prime, and type of religious assessment. First, when religious words have been used as primes, participant religiosity has not influenced moral outcomes (e.g., Ahmed & Salas, 2011; Randolph-Seng & Nielson, 2007; Shariff & Norenzayan, 2007). When no prime was used in a moral judgment task, then personal religiosity influenced decisions (Cohen & Rozin, 2001). When religious pictures were used as primes in a nonmoral judgment task, (Baldwin, et al. 1990; Weisbuch-Remington, 2005), then personal religiosity mattered. Second, because religion is difficult to define based on its highly subjective nature, it is also difficult to assess. Some studies have assessed religion based on denomination and found that it does not influence moral outcomes (Fumagalli, et al, 2010; Shariff & Norenzayan, 2007). One study found that denomination influenced moral judgments (Weisbuch-Remington, 2005), but the prime types of the former and latter studies varied. Others have found influences of fundamentalist/dogmatic beliefs (defined as orthodoxy, or the degree to which a person believes there is one foundational set of teachings about all human truths; Altemeyer & Hunsberger, 2004) (Morewedge & Clear, 2008; Wahrman, 1981), and still others have looked at subjective assessment of religious practice (Baldwin, et al. 1990).

The current experiments looked at both factors: the influence of prime type and religious assessment on moral decisions. Here, both prime types (pictures and words) activated religious information (Studies 1 and 2), and influenced moral decisions (Studies 3 and 4), although religious pictures seemed to encourage these outcomes to a greater degree than words. Moreover, only the fundamental beliefs assessment (RFS; Altemeyer & Hunsberger, 2004) resulted in an interactive effect on moral decisions in Study 3. Assessments of religious behavior and denomination did not yield any significant results (see Footnote 1, p. 22). Taken together with previous

research, the current data provide further evidence that religious beliefs do not influence moral outcomes when words are used as primes. They do influence these outcomes when pictures are used as primes, but by assessing religion as fundamentalism, rather than on denomination or frequency of faith practices.

Why might this be? Winchester (2008) argued that one's moral identity is shaped by religious beliefs and faith-based ritual behavior. This may be particularly true for people with a fundamentalist perspective of their faith – the perspective that influenced moral decisions in the current studies. Therefore, a salient visual icon of one's faith (the foundation of understanding humanity, and the source of a person's moral identity) likely has a significant impact on decisions made after viewing the picture. For the nonreligious person, morality is not bound up in any faith tradition, therefore deciding the moral appropriateness of an uncertain action should not have the dissonant influence on cognition that it might have had for religious participants. But the fact that these participants also made moral choices in the same direction as religious participants, that is the tendency to say 'wrong', suggests that activated religious information and along with it behavioral expectations of morality were the motivation for these decisions. This is further supported by the widespread awareness of what these icons represent, coupled with their general salience in the geographic region where the current studies were conducted (i.e., the "Bible belt"). It follows then that all participants were influenced by these religious icons, but those most strongly affected with those with a fundamentalist faith.

An area of future research would be to evaluate the strength of religious beliefs in an alternative manner, and then to measure moral decisions. According to Hill's (1994) attitude process model, the strength of an attitude should be demonstrated in an automatic versus controlled task. Thus, participants could be cognitive loaded (meaning that internal cognitive processing

resources, i.e., working memory capacity, would be taxed) or not, and then participants would make moral decisions after being primed with religious pictures. Religious (versus nonreligious) participants should express their religious beliefs via harsher ratings to morally ambiguous actions when cognitively loaded (than when not loaded).

7.2.3 Imagery

The literature on imagery and moral decision making is small but growing. Amit and Greene (2012) found that engaging visual imagery during moral deliberation led to deontological (behavior-focused) decisions to trolley-type scenarios. This led the authors to conclude that when behaviors and outcomes are in conflict (as they are in trolley-type scenarios), then the greater good is sacrificed, meaning that participants opt to refrain from action (doing nothing which leads to the death of five people), rather than taking action (killing one person in order to save five others). This may be because moral deliberation is a more salient process if coupled with visual imagery (Caruso & Gino, 2011). Thus, when told to visualize the events in the scenario, and you are the person doing the pushing (and inevitably the killing), then the choice which keeps you from carrying out what you have just imagined is selected (i.e., the deontological choice).

It has recently been demonstrated that religious people tend to make more deontological choices when presented with moral scenarios (Banerjee, Huebner, & Hauser, 2010). Given the history and focus of appropriate behavior (via ten commandments, for example) it follows that participants with affirmed religious beliefs find it difficult to transgress even if the outcome of transgressing leads to benefits (i.e., saved lives) for the greatest number of people. Although the Amit and Greene (2012) study did not assess religious belief among participants, and the Banerjee and colleagues (2010) study did not include a visual imagery manipulation, taken to-

gether, there are implications for the current and future studies. The current studies found that visual pictures influenced moral decisions, possibly because of the salience of the visual modality as argued by Caruso and Gino (2011). The current studies did not use trolley-type scenarios to assess moral decisions, although future studies could assess the influence of using pictures on moral decisions for situations that include more contextual information than the behaviors in Studies 3 and 4 of the current paper.

7.3 Priming

Although spreading activation was the theoretical foundation for the predicted priming effects, the current studies did not directly test the superiority of spreading activation over non-spreading activation theories. Spreading activation states that priming occurs as a result of the facilitation of activity from one semantically related node to another, whereas non-spreading activation (e.g., Dosher & Rosedale, 1989) states that priming is the result of the familiarity of specific paired associations. In the current studies, type of prime (religious, control) were presented in block format, such that participants were primed with the same category of symbol over and over again until all trials within the block were complete. Spreading activation accounts suggest that repeated exposure to a prime stimulus leads to accumulation of activation at related semantic nodes (Collins & Loftus, 1975). It follows then that, in regard to the current studies, RT to accurate lexical decisions of religious words should be faster by the end of the religious picture block than at the beginning. Conversely, non-spreading activation accounts suggest an action-potential-type priming effect such that each time a prime is presented the effect of the prime reaches a standard capacity which cannot be exceeded. Thus, even repeated exposure to similar prime categories would not influence RT across the duration of the trial set (Dosher & Rosedale, 1989; Ratcliff & McKoon, 1988). Follow up analyses from Study 1 confirm the former account

– priming of religious pictures spread and accumulated at associated links thereby leading to faster responses at the end of the prime block.

Although the data from Study 2 did not fully confirm predictions, this may have occurred because spread of activation did not occur in the same way that was demonstrated in Study 1 with religious pictures. The same follow-up analyses run on Study 1 were run on Study 2, and showed that in fact priming did occur for both concrete and abstract religious word primes (but not control word primes). Evidence for priming, but lack of evidence for priming in the expected directions may relate to the limitations of the stimuli used. First, free association from pictures to words was not conducted, but could be done in future experiments. Second, religious and nonreligious words used as prime stimuli were not pre-tested for concreteness, and therefore were not calibrated for factor, but rather were subjectively chosen by the experimenter. Future studies should remedy this by pre-testing all words (prime stimuli and words used in the lexical task) for concreteness (along with other pre-test measures gathered in the current studies, that are valence, familiarity, spiritual-relatedness).

Furthermore, spreading and non-spreading activation theories should respond differently if a mediated stimulus was introduced between prime and target item. Thus, future studies could test which theory accounts for the priming effect demonstrated here by introducing a second lexical word in a trial set. For example, a prime (religious picture) could be presented, followed by a mediating word or nonword presented for lexical judgment, followed by the target religious word for lexical judgment. If priming occurred regardless of the mediating prime then spreading activation is evident. If priming is reduced then this provides evidence for non-spreading activation (McKoon & Ratcliff, 1992). Conversely, a second, and unrelated, picture could be shown

between the primary prime cue (i.e., religious picture) and the target religious word. Again, if priming occurred then spreading activation accounts would be supported.

7.4 Conclusions

The overarching goal of the current experiments was to examine the controversial and inconsistently linked relationship between religion and moral decision making. Four specific research aims were tested: 1) To determine whether presentation of religious pictures would facilitate identification of related items (religious words), 2) To determine whether the verbal labels of religious pictures would lead to the predicted facilitation referenced in Aim 1, 3) To determine whether presentation of religious pictures would facilitate moral judgments consistent with known religion-based expectations of morality, and 4) To determine whether individual religious beliefs moderate the relationship between picture (or word) prime and decision outcome (lexical or moral) outlined in the aforementioned aims. In sum, these data demonstrate that religious pictures prime religious information and guide moral decisions. This priming effect is more pronounced for self-reported religious than nonreligious persons.

Future research should replicate these data, and could possibly extend the breadth of influence religious pictures have (from moral decisions to actual behavior). Additionally, it may also be that the relationship between icons (associated with normative moral behavior) and moral decisions extend beyond religious icons exclusively. Other pictures, as demonstrated by Broeders and colleagues (2011), may also be iconic (and therefore encouraging) of moral decisions/behaviors. Thus, future researchers could identify a catalog of other pictures which represent moral expectations. Doing so could have implications for moral education in faith-based or school-based settings, as well as in correctional facilities where boundaries of socially normative behavior have been violated.

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APPENDICES

Appendix A

Table 1. (Study 1, 3) Pictures used as primes

PICTURE	PICTURE TYPE	AVG. RELIGIOSITY	AVG. VALENCE	AVG. FAMILIARITY
	Religious	6.64	6.00	6.86
	Religious	6.14	5.50	6.07
	Religious	6.07	6.21	6.79
	Religious	5.86	6.00	6.71
	Religious	5.71	3.14	5.93
@@@@@	Control	1.60	4.40	7.00
#####	Control	1.60	4.40	7.00
%%%%%	Control	1.60	4.40	7.00
^^^^^	Control	1.60	4.00	4.40
*****	Control	1.60	3.80	7.00

Appendix B

Table 2. (Study 1, 2) Words used in the lexical decision task

WORD	WORD TYPE
Adterie	Nonword
Accord	Religious
Accuracy	Nonreligious
Alike	Nonreligious
Artistic	Nonreligious
Belff	Nonword
Benevolence	Religious
Bless	Religious
Caring	Nonreligious
Cherish	Religious
Civilized	Nonreligious
Communion	Religious
Compassion	Religious
Compliments	Nonreligious
Dawpishness	Nonword
Decency	Religious
Declare	Religious
Drerm	Nonword
Elstown	Nonword
Encourages	Nonreligious
Endurance	Religious
Faithful	Religious
Fitness	Nonreligious
Froozation	Nonword
Gheen	Nonword
Goodness	Religious
Harmony	Religious
Improving	Nonreligious
Insights	Nonreligious
Kindness	Religious

WORD	WORD TYPE
Marvelous	Nonreligious
Mastery	Nonreligious
Mercy	Religious
Mongerate	Nonword
Peace	Religious
Phoycener	Nonword
Pleath	Nonword
Poised	Nonreligious
Purity	Religious
Rejoice	Religious
Restraint	Religious
Scapps	Nonword
Scirely	Nonword
Serkern	Nonword
Smiling	nonreligious
Swarlers	Nonword
Sympathy	Religious
Tabirsch	Nonword
Table	Nonreligious
Terrific	Nonreligious
Thrived	Nonreligious
Timely	Nonreligious
Treastle	Nonword
Tunceness	Nonword
Valiant	Nonreligious
Vawlerly	Nonword
Wherlor	Nonword
Whertish	Nonword
Worship	Religious
Youthful	nonreligious

Appendix C

Table 3. (Study 2, 4) Words used as primes

[Note: * Words that represent pictures presented as primes in Studies 2 and 4. ** Words that were not used in Study 4]

	WORD PRIME	RELIGIOSITY	CONCRETE/ABSTRACT
**	Blemin	Control	Abstract
**	cubble	Control	Abstract
**	Danter	Control	Abstract
**	Flazik	Control	Abstract
**	Gastan	Control	Abstract
**	Lactain	Control	Abstract
**	Puxil	Control	Abstract
	Corple	Control	Abstract
	Daver	Control	Abstract
	Nucade	Control	Abstract
	Ompost	Control	Abstract
	Roaken	Control	Abstract
	Sarlin	Control	Abstract
	Vorgo	Control	Abstract
	Yertan	Control	Abstract
**	Delight	Religious	Abstract
**	Ethical	Religious	Abstract
**	Gospel	Religious	Abstract
**	Grace	Religious	Abstract
**	Integrity	Religious	Abstract
**	Morals	Religious	Abstract
**	Righteousness	Religious	Abstract
**	Saved	Religious	Abstract
	Amen	Religious	Abstract
	Fellowship	Religious	Abstract
	Forgiveness	Religious	Abstract
	Holy	Religious	Abstract
	Hospitality	Religious	Abstract
	Salvation	Religious	Abstract
	Self-control	Religious	Abstract
*	Asterisk	Control	Concrete
*	At sign	Control	Concrete
*	Insert/caret	Control	Concrete
*	Number sign	Control	Concrete
*	Percent sign	Control	Concrete

**	Ampersand	Control	Concrete
**	Backslash	Control	Concrete
**	Comma	Control	Concrete
**	Dash sign	Control	Concrete
**	Minus sign	Control	Concrete
**	Plus sign	Control	Concrete
**	Question mark	Control	Concrete
	Apostrophe	Control	Concrete
	Parentheses	Control	Concrete
	Semicolon	Control	Concrete
*	Christian fish	Religious	Concrete
*	Crown of thorns	Religious	Concrete
*	Crucifix	Religious	Concrete
*	Dove of peace	Religious	Concrete
*	Eucharist/communion	Religious	Concrete
**	Baptism	Religious	Concrete
**	Disciple	Religious	Concrete
**	Heaven	Religious	Concrete
**	Pulpit	Religious	Concrete
**	Resurrection	Religious	Concrete
**	Saint	Religious	Concrete
**	Sermon	Religious	Concrete
	Church	Religious	Concrete
	Jesus	Religious	Concrete
	Pastor	Religious	Concrete

Appendix D

Table 4. (Study 3, 4) Action phrases used in the moral judgment task

[Note: Values listed to the right of each phrase are average ratings of moral appropriateness (1=morally wrong, 7=morally right)]

THEME	MORALLY RIGHT		MORALLY AMBIGUOUS		MORALLY WRONG	
Sanctity/ Degredation: Decency	Having sex with your committed partner	5.78	Having sex with a friend	3.89	Having sex with a biological family member	1.22
Sanctity/ Degredation: Disgust	Eating uncontaminated food on your plate	4.33	Eating food a cockroach walked past but did not touch	5.33	Eating food a cockroach has just walked across	4.56
Sanctity/ Degredation: God	Helping to paint church walls with words of hope	6.33	Walking past others marking up church walls	2.89	Painting church walls with hate speech	1.00
Fairness/ Cheating: Stealing	Finding a wallet and returning it	7.00	Finding a wallet and taking the cash inside	2.11	Stealing someone's wallet	1.11
Fairness/ Cheating: Lying	Honestly stating your work experience on your resume	7.00	Embellishing your work experience on your resume	3.22	Boosting your resume with experience you've never had	2.11
Fairness/ Cheating: Bully	Befriending everyone – even the least popular kids in school	5.78	Avoiding, but not directly picking on, the least popular kids in school	3.11	Repeatedly picking on the least popular kids in your school	1.78
Loyalty/ Betrayal: Betrayal	Defending a classmate who is being verbally abused	6.56	Staying silent while a classmate gets verbally abused	1.89	Joining in to verbally abuse a classmate of yours	2.11
Loyalty/ Betrayal: Infidelity	Remaining honest with your spouse	6.56	Lying to your abusive spouse	3.56	Lying to your spouse	1.67

Loyalty/ Betrayal: Patriotism	Displaying the flag of your home country	6.44	Displaying the flag of another country	5.00	Burning the flag of your home country	2.00
Care/Harm: Vulnerable	Offering to help a homeless person in need	5.67	Pretending you don't see a homeless person who needs help	3.33	Aggressively refusing to help a homeless person in need	2.33
Care/Harm: Suffer	Comforting a friend after their spouse passes away	6.33	Being unable to comfort a grieving friend	4.33	Repeatedly reminding a friend that their spouse is dead	1.67
Care/Harm: Cruel	Humanely killing a deer and eating the meat	3.89	Accidentally killing a deer with your car	3.22	Watching a deer slowly suffer and die	1.44
Authority/ Subversion: Respect	Respecting your mother	6.67	Screening calls from your mother	3.56	Telling your mother to "go to hell"	2.78
Authority/ Subversion: Tradition	Voting in a presidential election	6.44	Forgetting to vote in a presidential election	4.11	Refusing to vote in a presidential election	3.44
Authority/ Subversion: Chaos	Signing a petition against a corrupt business	5.00	Disrupting a business with a flashmob	3.44	Breaking windows of a corrupt business	2.00
AVERAGE		**5.99**		**3.53**		**2.08**