The Effect of Religious Imagery On Following Suggestions for Risk-Taking

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THE EFFECT OF RELIGIOUS IMAGERY ON FOLLOWING SUGGESTIONS FOR RISK-TAKING

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THE EFFECT OF RELIGIOUS IMAGERY ON FOLLOWING SUGGESTIONS FOR RISK-TAKING

by

JESSICA MARIE SHENBERGER TRUJILLO, B.A.

THESIS

Presented to the Faculty of the Graduate School of The University of Texas at El Paso in Partial Fulfillment of the Requirements for the Degree of

MASTER OF ARTS

Department of Psychology

THE UNIVERSITY OF TEXAS AT EL PASO

May 2013
Abstract

Events such as “9/11” show that religion can be used to promote negative social behavior. The aim of the current study was to test whether religious imagery leads individuals to follow suggestions for increased risk-taking behaviors. The current study used culturally relevant positive and negative religious imagery primes (i.e., Virgin de Guadalupe and Santa Muerte) as well as positive and negative non-religious imagery primes (i.e., Frida Kahlo and La Malinche) and measured the extent to which individuals followed a confederate’s suggestions to engage in risky behaviors on a Balloon Analogue Risk Task (BART). Individuals varied in the number of over inflations on the BART (our measure of risk) as a function of confederate suggestion and religious versus non-religious imagery. As predicted, the effect for confederate suggestion led to greater increased risk taking in the religious imagery condition than in the non-religious imagery condition. The findings have important implications for current narco-terrorism in Ciudad Juarez, and in other locations where terrorists use religious imagery to manipulate gang members. The findings demonstrate that when individuals are exposed to religious concepts, they are more susceptible to the influence of others to engage in risky behaviors.
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Introduction

Following the devastating events of 9/11, our nation scrambled to answer the questions: who are these terrorists and what led them to kill thousands of people? In the wake of the tenth anniversary of the terrorist attacks, it is evident that the answers to these questions are far more complex than would first appear. Politicians, government officials, and laymen had various definitions of our terrorist enemies. Some faulted those from the Middle East. Others pointed to specific religious extremist groups. Social scientists began examining the effects of religious references on social behaviors.

Religious References and Social Behaviors

Researchers have shown effects of religious references on both positive and negative behavior. At times, religious references are strongly related to positive social behavior (Batson, Schoenrade, & Ventis, 1993). For example, Pichon, Boccato, and Saroglou (2007) tested the impact of religious concepts on pro-social behaviors. In their study, a lexical decision task was utilized to implicitly prime individuals with either positive religious words (e.g., heaven, miracle, or bless), neutral religious words (e.g., sacrament, bible, or communion), or positive or neutral non-religious words (e.g., freedom, smile, diary). Participants then were offered information pamphlets to increase awareness about a local charitable organization. Individuals primed with positive religious concepts took more pamphlets than those primed with neutral religious words or non-religious words (positive or neutral).

Similarly, Shariff and Norenzayan (2009) found that priming general religious concepts increased pro-social behavior. To test, participants were randomly assigned to receive a prime with religion-based concepts using a sentence scramble paradigm or to receive no prime. For this task (adapted from Srull & Wyer, 1979), individuals who received the religious prime saw a total of 10 sentences. The religious sentence scramble set consisted of 5 sentences with neutral words (e.g., tire or diary) and 5 sentences with religious words (e.g., soul or heaven). The goal of this task was to review the five presented words (e.g.,), choose an unrelated word, drop the extraneous word, and rearrange the remaining four words to
create a grammatically complete sentence (e.g., “tire flat was soap the” becomes “The tire was flat”). Those assigned to the religious scramble set condition saw words such as “a saw miracle feel he” (e.g., “He saw a miracle.”).

Once primed, participants completed an economic gain task in which they were given the decision to leave up to 10, one-dollar coins for another participant. Participants primed with religious concepts left significantly more coins for the other participants than did those primed with neutral concepts. This increase in generosity further supports the hypothesis that religious references can positively affect behavior. In sum, research supports the conclusion that under some conditions, religious references have positive influences (e.g., Saroglou, Delpierre, & Dernelle, 2004; Sosis & Ruffle, 2004).

Intuitively, religious ideation is linked to positive behavior. After 9/11, however, researchers began to ask: are religious references also used to promote negative social behavior? Bushman, Ridge, Das, Key, and Busath (2007) tested this by providing participants with a passage that was said to be either from the Bible or from ancient scrolls. Once told the origin of the text (religious or non-religious), participants read a passage that described a violent scenario that ended with a call for violence. Bushman et al. (2007) found that participants who were told that the passage came from the Bible used increased levels of loud noise to punish other participants in a subsequent task, as compared to those who were told that violence was sanctioned by non-religious, ancient scrolls. These findings demonstrated that under certain circumstances religious references can lead to negative social behaviors.

Similarly, other studies have sought to understand the influence of religious references on social behaviors. Van Beest and Williams (2011) measured the extent to which individuals identified as being intrinsically religious and manipulated perceptions of exclusion by God. To this end, participants read a passage that explicitly mentioned exclusion (i.e., “My God, my God, why have you forsaken me?”; Mark 15:34) or no mention of exclusion (i.e., “Do not be afraid or terrified because of them, for the Lord your God goes with you.”; Deuteronomy 31:6). Following the manipulation of exclusion, participants
who were high in intrinsic religiousness and read the exclusion Bible passage made fewer donations to a charity (the dependent variable for this study) than those high in intrinsic religiousness who read the non-exclusion Bible passage. These findings show that under certain circumstances, religious concepts are related to more negative attitudes toward others. In sum, religious references may lead to a negative social outcome.

**Religious References, Submissiveness, and Conformity**

In order to understand under what conditions religious primes might elicit either positive or negative behaviors, Saroglou, Corneille, and Van Cappellen (2009) investigated one process through which religious references affects behaviors. Study one found that individuals primed with religious concepts more readily accessed submissive related concepts using a lexical decision task. In study two, participants were primed with religious or neutral concepts then were given negative performance feedback from a fictitious second participant (Saroglou et al., 2009). Participants high in submissiveness and primed with religious concepts were more likely to follow the experimenter’s suggestions to allocate more difficult tasks for the fictitious participant who provided the negative feedback as compared to participants primed with neutral concepts. These findings (Saroglou et al., 2009) demonstrated that submissiveness is one important factor when considering the effects of religious references on behaviors.

The effects of religious references are multifaceted. In particular, depending on the immediate context and present influences (e.g., an individual providing suggestions for action; see Saroglou et al., 2009), religious references can lead to very different outcomes. When primed with religious references alone, individuals can increase their positive social behavior. When primed with religious concepts suggestions for increasing punishment to others, individuals increase negative social behaviors. Introducing the influence of a peer or leader can lead individuals to engage in either positive or negative social behaviors.
Van Cappellen, Cornelle, Colis, and Saroglou (2011) tested the effects of religious references on the extent to which individuals follow a leader’s suggestions (compliance) and the suggestions of peers (conformity). In this study, participants were primed with neutral or religious concepts through a lexical decision task and then took part in an estimation activity based on a paradigm developed by Asch (1951). In a computer-based task adapted from Castelli, Vanzetto, Sherman, and Acuri (2001), Van Cappellen et al. (2011) showed participants a total of 16 screens with the letter “a” appearing in various amounts (148 to 1,156 per screen). The goal of the task was to estimate the number of “a”s on each screen that was briefly presented to the participant. For eight of the 16 screens, participants were provided with an estimation that was said to be from a participant who had previously completed the same task (a factitious participant). Individuals who scored high on a submissiveness measure (Saroglou et al., 2009) and primed with religious concepts were more consistent with the factitious participant’s estimation than individuals primed with non-religious concepts. These findings demonstrated that for those who were high on the individual trait of submissiveness, religious concepts increased the extent to which the individual conformed to the suggestions of peers. By identifying under what conditions religious references influence social behaviors, we might better identify the factors that cause individuals to follow others. The goal of the proposed research was to improve our understanding of these effects.

**Risk-Taking Behavior**

The goal of the current study was to extend previous findings on the effect of religious references on behaviors to a risk-taking context. Specifically, this study tested the extent to which individuals followed suggestions of others to engage in risk-taking behaviors. In the literature, risk-taking behaviors are generally defined as the willingness to pursue activities that could lead to monetary, social, or interpersonal losses (Bechara, 2003).
Researchers (Lejuez et al., 2002) developed the Balloon Analogue Risk task (BART) to identify individual’s propensity for taking risks. The BART is a computer-based task that presents participants with 30 trials of balloons. For each trial, participants are told that for each click they make the balloon will increase in size by one inflation. For each inflation, the participant earns money in their balloon bank. In the margin of the screen the participant can monitor the amount of money earned for the balloon trial as well as the total bank earned for the task. When the participant wishes to stop inflating the balloon (before a burst) the participant can stop the trial and add all earned money for that trial to their total bank. The goal of the task is to earn as much as possible for each balloon trial without over inflating the balloon, as an over inflation results in a loss of all money earned on that trial.

Since the development of this task, many researchers have reported the BART to be correlated with real-world risk-taking (Fecteau, Pascual-Leone, Zald, Liguori, Theoret, Boggio, & Fregni, 2007; Williams, Fox, Lejuez, Reynolds, Henderson, Perez-Edgar, Steinberg, & Pine, 2010). For example, researchers found that increased risk-taking on the BART is related to decisions to smoke or engage in unsafe sex (Lejuez, Aklin, Zvolensky, & Pedulla, 2003). The BART task produces various outcome variables, however the total number of over inflations out of 30 trials is the focus of the current study. The BART is a reliable measure of risk-taking (Pearson correlation for test-retest reliability, $r = + .66$ to $+.77$, $p < .001$; White, Lejuez, & de Wit, 2008). In sum, the BART is correlated with real-world risk taking decisions.

The extent to which religious iconography influences risk-taking behaviors may also be important in understanding the violent drug-related gang behavior in Ciudad Juarez, Mexico. This city is known for its devastatingly high homicide rates (Beittel, 2011). It is estimated that over 5,300 individuals died from drug cartel related violence from 2008 to 2010 (Borunda, 2010; Beittel, 2009). The prevalent violence in Juarez is considered “narco-terrorism” (Sullivan & Beittel, 2008) in that those involved in narcotics trafficking attempt to influence policies of a government or society through
violence and intimidation. There is no debate about the widespread negative impact this violence has on the community. One area needing investigation, however, is the cartel’s use of religious icons and the influence of these religious references on the extent to which individuals follow a leader in a risk-taking context.

One of the most popular religious images connected with the Mexican drug cartels is Santa Muerte. Santa Muerte is rooted in the history of Mexico and is loosely connected to the Catholic Church (Dahlin, 2011). Santa Muerte (or the Saint of Death) is a faux saint and is generally portrayed as a skeletal woman’s figure dressed in long robes holding a scythe and globe. Edifices dedicated to Santa Muerte can be found in Mexico, with one well-known shrine located in Mexico City. Santa Muerte is often referred to as the “narcosaint” as devotees seek her protection during risky behaviors. In general, research shows that those who follow Santa Muerte tend to live in areas that are characterized by increased illegal activities (drug trafficking, smuggling, or illegal immigration) and increased risk (Dahlin, 2011).

Religious imagery is most commonly conceptualized in its positive form. Various world religions, however, have also incorporated the use of negative religious symbols. One negative theme present in religious symbolism is death. The Hindu religion incorporates images of Mara, the goddess of death (Kanetzky, 1982). Another example is Azrael, the angel of death in Islam (Field, 2011). Multiple religions pray to or worship negative symbols. Santa Muerte is only one example of a negative or death-related saint that is worshiped as a protective angel (for more information about other saints such as Jesus Malverde, see Dahlin, 2011).

The goal of the current study was to examine the effects of culturally relevant religious imagery commonly used in the El Paso borderland region area by Mexican drug cartels. We sought to test the extent to which exposure to religious imagery, including folk religious imagery such as Santa Muerte, influenced the extent to which individuals followed suggestions for increased risk-taking.
Pilot Study: Effect of Religious References on Following

We have begun to develop a program of research investigating the effects of religious references on behaviors. To this end, we conducted a study (Zárate, Shenberger, & Rivera, 2010; unpublished data) aimed to replicate the findings of Saroglou et al. (2009) and tested the effect of religious primes on the extent to which individuals followed a present confederate peer. It was predicted that individuals primed with religious concepts would follow a leader’s suggestions more than those primed with neutral concepts. To provide the background for the current study, our preliminary study will be discussed.

Method. Seventy-eight undergraduate students were recruited from Introductory Psychology classes and were compensated with either course credit or extra credit. Their average age was approximately twenty-two years. Fifty-five percent of the participants were female, and ninety-two percent of the participants in this study identified as Latino. Six participants were excluded from analyses due to language barriers or incomplete responses on the dependent variable. Participants were primed with religious or neutral concepts through a sentence scramble task (Shariff & Norenzayan, 2009). Once participants completed the prime task, they were directed to a second task in which they were provided with an essay on two potential research centers being proposed by their university. Participants were told that due to budget cuts, we were asking for their feedback about the costs and benefits of both centers to recommend a redistribution of funding to account for the budget cut. Once participants read the essay, they met as a group with the other participants (and a confederate posing as a participant) to discuss their opinions. The confederate leader used a pre-written script to argue for a majority of the funding to be removed from one center over the other. The confederate was always the first and last person to speak and was trained to come off as an out-spoken group member.

Once participants finished discussing their opinions, they were asked to indicate their suggestions for resource removal from the two centers (amounts were indicated in percentages that equaled 100, e.g., 10% and 90%), and complete two short surveys. The first survey completed by
participants was the submissiveness scale. On a seven-point scale ranging from “strongly agree” to “strongly disagree” participants were asked to indicate a response to each statement that best described how they perceived themselves (adapted from Saroglou et al., 2009). Statements included: I see myself as someone who: 1) is timid, 2) is docile, 3) is not as self-assertive as s/he could be, 4) chooses his/her own goals, 5) is a free thinker. Then participants completed a brief demographic information questionnaire. Information collected included age, ethnicity, and gender. Once finished, participants were debriefed and thanked for their time.

Results. The results showed that individuals who were primed with religious concepts made allocation decisions that were more consistent with the confederate’s suggestions for funding reallocation. We first tested for the effect of religious primes on consistency with confederate’s suggestions by conducting an analysis of variance (ANOVA). Those in the religious prime condition ($M = 61.92$, $SD = 14.89$) were more consistent with the confederate’s suggestions than those primed with neutral concepts ($M = 53.91$, $SD = 20.97$), $F(1, 69) = 3.80$, $p = 0.06$. Previous research (Saroglou et al., 2009) found the effects of religious references on following confederate suggestions for those high in submissiveness. To take into account variance due to submissiveness, we included submissiveness as a covariate. An Analysis of Covariance (ANCOVA) showed a significant effect of prime on consistency with the leader’s suggestions, $F(2, 68) = 4.95$, $p = .03$. Those primed with religious concepts were more consistent with the leader’s suggestions than those primed with neutral concepts. In sum, after controlling for variance due to submissiveness, religious concepts led individuals to follow suggestions more.

Focus of Current Research

Taking into consideration the literature on the effect of religious references on the extent to which individuals will follow the suggestions of others, it was hypothesized that the presence of these culturally relevant negative religious images may influence those involved in risky behaviors.
Specifically, it was predicted that priming individuals with religious concepts, as opposed to non-religious concepts, would lead individuals to follow a peer’s suggestions and engage risk-taking behaviors. To test this, individuals were primed with culturally relevant negative religious imagery (i.e., Santa Muerte), culturally relevant positive religious imagery (e.g., Virgin de Guadalupe), or negative or positive non-religious images (e.g., La Malinche and Frida Kahlo) and exposed to a confederate who prompted subjects to engage in risk-taking behavior. It was predicted that individuals who were exposed to the religious imagery (negative or positive) would follow the leader’s suggestions to engage in risk-taking behavior more than individuals primed with the non-religious imagery (negative or positive).

To test whether negative religious imagery (Santa Muerte) differentially impacts the extent to which individuals follow confederate suggestions for risk taking on the number of over inflations made on the BART, as compared to positive religious imagery (Virgin de Guadalupe), we included valence in our design. Literature to date has only focused on the effects of positive and neutral religious concepts (e.g., Pichon et al., 2007) and we therefore did not have specific predictions. Theoretically negative valence religious imagery may contribute to greater risk-taking behavior in the service of violent goals, and thus may be a contributor to the Ciudad Juarez violence. Thus, negative valence imagery was a necessary component in our model.
Method

Pretesting Stimuli

To measure whether our stimuli prime positive religious, negative religious, positive non-religious, and negative non-religious concepts, we surveyed 13 individuals. Specifically, participants saw a total of 3 images for each prime type and rated to what extent they view the image as negative (or positive), religious (or non-religious), and the extent to which they were readily able to identify the person in the image. On average, participants rated the Virgin de Guadalupe as positive \( (M = 6.17, SD = 1.27) \) and religious \( (M = 6.83, SD = 0.58) \) and Santa Muerte as less positive \( (M = 1.25, SD = 0.62) \) and religious \( (M = 4.00, SD = 2.61) \). Additionally, participants rated Frida Kahlo as positive \( (M = 5.33, SD = 1.67) \) and less religious \( (M = 2.67, SD = 1.83) \) and La Malinche as less positive \( (M = 3.33, SD = 1.56) \) and less religious \( (M = 2.75, SD = 1.71) \). Once we obtained these ratings, those images that most closely fit our prime categories were used so that we incorporated only one image per condition.

Participants

To determine the needed sample size, a power analysis was conducted using GPower (Faul, Erdfelder, Buchner, & Lang, 2009). That analysis revealed that approximately 98 participants were needed to test for mean differences and interaction effects when including three independent variables and four covariates \( (\alpha = .05, \beta = .80, f^2 = .15) \). Participants \( (n = 97) \) were undergraduates at the University of Texas at El Paso recruited using SONA system and compensated with course credit. Participants were about 20 years old \( (M = 20.04, SD = 5.76) \) and 66.67 percent were female and 68.82 percent were Hispanic. Due to software error, four participants’ Balloon Analogue Risk Task data failed to record and we excluded these participants from analyses; the analyzed number of participants was 94.

Design

The design of the study was a 2 (Prime Type: religious prime vs. non-religious prime) X 2 (Prime Valence: positive vs. negative) X 2 (Confederate Bias: risk-taking suggestions vs. no
suggestions) between subjects design with the amount of over inflations on the Balloon Analogue Risk Task (Lejuez, Read, Kahler, Richards, Ramsey, & Stuart, 2002) as the dependent variable. We also measured individuals’ levels of submissiveness (Saroglou et al., 2009), attitudes toward risk (Franken, Gibson, & Rowland, 1992), exposure to religion, and exposure to Mexico (covariates) and controlled for these factors in our analyses.

Materials and Procedure

Upon arrival at the experimental session, we provided participants with a consent form to inform them of what will be asked of them as a participant and of their participant rights. Once participants consented, they were randomly assigned to one of four prime types by prime valence combinations (i.e., negative religious image, positive religious image, negative non-religious image, or positive non-religious image) and then asked to complete a short writing task. For this task, participants saw the image assigned for their prime (i.e., Santa Muerte, La Virgin de Guadalupe, La Malinche, and Frida Kahlo) and were asked to write a three to four paragraph essay on the images and its influence on modern culture.

Once participants completed the priming task, they met with the other participant in their experimental session (i.e., the confederate posing as another participant) to participate in a balloon game BART (Balloon Analogue Risk Task; Lejuez et al., 2002). Participants were told that they would work as a pair to complete the balloon task. The experimenter set up the task on the participant’s computer and the confederate sat next to the participant to engage in the task. The experimenter instructed that due to position of the partners (i.e., the participant was already seated at the computer being used for the BART), clicking for balloon inflations was assigned to the participant. We modified the original BART
software script such that the balloons were set to pop at a random point between 1 and 25 with no replacement and the balloon size growth per inflation was increased to an increment of 24. ¹

The participants were told that their goal was to maximize the points earned through the each of the 30 trials of balloons. For each click they made the balloon increased in size by one inflation and they earned money in their balloon bank. The participant chose a stopping point for inflation for each balloon and all earned money for that trial was added to their total bank. The goal of the task was to earn as much as possible for each balloon trial without over inflating the balloon. As an incentive, those participants who were at the top 10% for money earned were entered into a random drawing for a $75.00 gift card. The participants were instructed that they would work together and that at the end their total amount earned would be recorded for each individual to qualify to enter the drawing.

In the bias condition, the confederate strongly encouraged the participant to engage in more risky stopping points with the inflation on the balloon task. Specifically, the confederate used a scripted dialogue (e.g., “keep going” or “we’ve got to keep clicking to win this”) to push the participant to continue inflating the balloon, regardless of balloon size or appraisal of risk. In the control condition, the confederate directed the question of when to stop to the participant (e.g., “what do you think?” or “it’s up to you”). As our dependent measure, we measured the number of times participants over inflated the balloon presented in the BART and forfeited their points as an assessment of risk taken.

Once participants completed the BART task, they were seated at their individual computers to complete the remaining portion of the study. Specifically, participants completed a submissiveness scale ($\alpha = .75; \alpha = .70$ as reported by Van Cappellen et al., 2011) that consisted of 6 items. Participants rated the extent to which they agreed to each statement (e.g., “I need the approval of others”) on a 7-point likert-like scale ranging from “strongly disagree” to “strongly agree” (appendix D). Additionally,

¹ The parameters of the BART were changed after a pilot test of this task demonstrated that the previous parameters (1/128) required a significant amount of time to complete. Shorter time to complete was ideal for the current study as we were testing the effect of a prime that occurred before the BART.
participants completed an Attitudes Toward Risk Questionnaire (α = .91; α = .92 as reported by Franken et al., 1992) that consisted of 20 items to assess their attitudes toward psychological risk (e.g., “I often think about doing things that I know society would disapprove of”) and physical risk (e.g., “the greater the risk the more fun the activity”). Responses were on a 5-point scale and ranged in options from “like me” to “not like me” (appendix E). Because the Attitude Toward Risk Questionnaire consisted of 20 items, a Principal Component Analysis (PCA) was conducted to verify that these items loaded onto the two hypothesized factors of psychological and physical risk. A PCA yielded five factors for these twenty items with the Kaiser criterion (Kaiser, 1960) of containing eigenvalues greater than one. Important to note, however, is that none of the items loaded well onto factors three, four, or five well. Additionally, the PCA revealed that the proportion of variance accounted for by the factors one and two were 37% and 13% respectively. The variance accounted for by factors three through five were much lower (7% and less). Finally, the associated scree plot shows support for retaining two factors, which is consistent with the literature (Franken et al., 1992. Thus, two factors were retained.²

Finally, participants completed a demographics form (appendix A) that assessed exposure to religion (α = .74) (items 8, 10, and 11 in Appendix A) exposure to Mexico (α = .75) (items 13, 14, and 15 Appendix A), and demographic information (e.g., gender, age, and ethnicity), and then were debriefed and thanked for their time.

² Three hierarchical regressions were run separately for subscale one (psychological risk), subscale two (physical risk), and the entire 20 item scale. Results were consistent for each regression and, therefore, the hierarchical regression for the full 20 item attitudes toward risk scale is reported.
Results

Primary Analyses

To test the hypothesis that individuals primed with religious images followed the suggestions of a peer to engage in risk-taking behavior resulting in more risk-taking behavior than individuals primed with non-religious concepts as a function of prime valence, we conducted a hierarchical regression first entering in submissiveness (scores ranged from 1.00 to 5.33), exposure to Mexico (scores ranged from 0.00 to 5.67), exposure to religion (scores ranged from 1.00 to 5.00), and attitudes toward risk into our model (scores ranged from 1.78 to 5.00 for Psychological Risk, and from 1.00 to 5.00 for Physical Risk). We predicted the number of over inflations on the balloon analogue risk task from prime type, confederate bias, prime valence, the 2-way prime type by confederate bias interaction, and the 3-way prime type by confederate bias by prime valence interaction.

The results of step one (entering submissiveness, exposure to Mexico, exposure to religion, and attitudes toward risk) indicated our covariates did not account for a significant proportion of the variance, $R^2 = .013$, $F (4, 90) = 0.29$, $p = .882$. In step two, prime type, confederate bias, the 2-way interaction of prime type by confederate bias, prime valence, and the 3-way interaction of prime type by confederate bias by prime valence were entered into the regression equation. The results indicated that our predictors accounted for 57% of the variance, $R^2 = .568$, $F (9, 82) = 12.00$, $p = .001$. See Table 1-2.

Table 1: Means and standard deviations for the effect of prime type, confederate bias, and prime valence on number of over inflations on the balloon analogue risk task

<table>
<thead>
<tr>
<th></th>
<th>Religious Prime</th>
<th>Non-Religious Prime</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bias No-Bias</td>
<td>Bias No Bias</td>
</tr>
<tr>
<td>Negative Valence</td>
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<td></td>
</tr>
<tr>
<td>M</td>
<td>22.000</td>
<td>20.286</td>
</tr>
<tr>
<td>SD</td>
<td>4.431</td>
<td>7.342</td>
</tr>
<tr>
<td>Positive Valence</td>
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<td></td>
</tr>
<tr>
<td>M</td>
<td>21.823</td>
<td>16.333</td>
</tr>
<tr>
<td>SD</td>
<td>3.067</td>
<td>8.093</td>
</tr>
</tbody>
</table>

14
Table 2: Unstandardized regression coefficients and the intercept, t-values, and p-values for variables as predictors of over inflations on the balloon analogue risk task

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SE</th>
<th>t- value</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>11.018</td>
<td>2.692</td>
<td>4.09</td>
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</tr>
<tr>
<td>Submissive</td>
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<td>0.511</td>
<td>-0.23</td>
<td>0.818</td>
</tr>
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<td>Exposure to Mexico</td>
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<td>0.89</td>
<td>0.375</td>
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<td>Exposure to Religion</td>
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<td>0.528</td>
<td>0.90</td>
<td>0.369</td>
</tr>
<tr>
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<td>-0.278</td>
<td>0.684</td>
<td>-0.41</td>
<td>0.685</td>
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<tr>
<td>Confederate Bias</td>
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<td>1.548</td>
<td>4.50</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Prime Type</td>
<td>-1.862</td>
<td>1.450</td>
<td>-1.28</td>
<td>0.203</td>
</tr>
<tr>
<td>Prime X Bias Interaction</td>
<td>5.610</td>
<td>2.436</td>
<td>2.30</td>
<td>0.024</td>
</tr>
<tr>
<td>Valence</td>
<td>-0.368</td>
<td>1.242</td>
<td>-0.30</td>
<td>0.768</td>
</tr>
<tr>
<td>Prime X Bias X Valence Interaction</td>
<td>0.014</td>
<td>2.227</td>
<td>-0.01</td>
<td>0.995</td>
</tr>
</tbody>
</table>

There was no main effect for prime type such that whether imagery was religious ($M = 15.67$, $SD = 3.35$) or non-religious ($M = 15.05$, $SD = 6.26$) did not significantly predict over inflations on the balloon task ($B = -1.86$, $p = .203$). Confederate bias, however, ($B = 6.972$, $p < .001$) and the 2-way interaction of bias and prime type ($B = 5.61$, $p = .024$) predicted over inflations. Individuals exposed to non-religious imagery and *confederate bias* ($M = 18.31$, $SD = 7.72$) made more over inflations on the BART than those exposed to non-religious imagery and *no confederate bias* ($M = 11.79$, $SD = 4.80$), $t (93) = 4.28$, $p < .001$. Also, individuals exposed to religious imagery and confederate bias made more over inflations ($M = 21.91$, $SD = 3.75$) than those exposed to religious imagery and no confederate bias ($M = 9.44$, $SD = 2.96$), $t (93) = 8.69$, $p < .001$. As predicted, we found that the effect of confederate suggestion for increased risk taking was greater when individuals were exposed to religious imagery than to non-religious imagery, $t (93) = 2.36$, $p < .021$. Prime valence ($B = -0.37$, $p = .768$) and the 3-
way interaction of prime type, confederate bias, and prime valence were not significant \((B = 0.01, p = .995)\). Over inflations did not differ across prime valence conditions. See Figure 1.

Figure 1: Interactive effect of prime type and confederate bias on mean number of over inflations on the balloon task

![Interactive effect of prime type and confederate bias on mean number of over inflations on the balloon task](image)

**Secondary Analyses**

The dependent measure of amount of money earned on the 30 balloon trials is readily available using the Balloon Analogue Risk Task and, therefore, we tested for the effects of our predictors on money earned. We had no *a priori* predictions for money earned on the balloon task. The main effect of prime type, prime valence, and the two way interactions of prime type by valence and confederate bias by valence, as well as the three way interaction of prime type by confederate bias by prime valence on the amount of money earned on the balloon task were non-significant. Confederate bias, however, did significantly affect the amount of money earned on the balloon task. (Table 3).

Table 3: Effect of manipulated variables on total money earned

<table>
<thead>
<tr>
<th>Variable</th>
<th>F-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime Type</td>
<td>3.42</td>
<td>0.070</td>
</tr>
<tr>
<td>Confederate Bias</td>
<td>6.60</td>
<td>0.012</td>
</tr>
<tr>
<td>Prime Valence</td>
<td>1.26</td>
<td>0.270</td>
</tr>
<tr>
<td>Prime Type by Valence</td>
<td>0.30</td>
<td>0.583</td>
</tr>
<tr>
<td>Confederate Bias by Valence</td>
<td>0.35</td>
<td>0.556</td>
</tr>
<tr>
<td>Prime Type by Valence by Bias</td>
<td>0.00</td>
<td>0.978</td>
</tr>
</tbody>
</table>
We conducted exploratory analyses to investigate any additional factors that may influence the number of over inflations participants made on the balloon task. Participant gender \( F(1, 93) = 0.06, p = .810 \) and confederate (total of three used in this study) did not significantly affect the number of over inflations, \( F(1, 93) = 2.58, p = .082 \). Additionally, there was not a significant interaction of participant gender by confederate gender on over inflations, \( F(2, 92) = 0.86, p = .428 \).

Finally, for exploratory purposes, we tested whether there were any individual difference factors (e.g., prayer frequency, frequency of religious service attendance, and submissiveness) that may affect the relationship between our manipulated factors of prime type and confederate bias and our dependent risk taking variable of over inflations on the balloon task. We first sorted individuals by religious service frequency and prayer frequency and looked at the relationship between our prime type, confederate bias, and risk taking. We then sorted individuals by prime type and looked at the degree to which religious service attendance frequency and prayer frequency correlated with risk taking. The results of these analyses were non-significant and will not be discussed further.
Discussion

In general, the current study demonstrated that confederate suggestions influenced the extent to which individuals engaged in risk-taking on the balloon task regardless of prime type, and as predicted, the effect of confederate suggestions for increased risk-taking resulted in *more* risky stopping points for inflations on the balloon task for individuals exposed to religious imagery as compared to individuals exposed to non-religious imagery. These findings demonstrated that the influence of others increased risk-taking, and that this effect was greater when individuals were exposed to religious concepts. Finally, we found that approximately 57% of the variance observed in the number of over inflations on the balloon task can be explained by the effects of exposure to religious/non-religious imagery and confederate bias.

Previous studies (e.g., Saroglou et al., 2009; Zárate et al., 2010) found that individual differences in submissiveness were key in understanding the interactive effect of religious references and confederate suggestions on social behaviors. The current study, however, did not find that submissiveness explained any of the variance in the number of over inflations on the balloon task. Future research should continue to address whether submissiveness is an important influence on how individuals are affected by religious concepts.

Researchers have examined the differential effects of positive and neutral religious references on social behaviors (e.g., Pichon et al., 2007). To date, however, the current study presented the first test of the effect of negative religious references and positive religious references on behaviors. We did not have specific a priori predictions for the effect of prime valence. Because the use of negative religious imagery (e.g., Santa Muerte or Jesus Malverde) on the U.S./Mexico border and in particular by the drug cartels is so prevalent (Dahlin, 2011), it was of theoretical interest to test for the differential effects of imagery valence on risk-taking. The current findings did not indicate that valance influences risk-taking. While we did not find support for the differential effects of prime valence, it is important to note
that the current study *did* find significant effects for the culturally relevant religious and non-religious imagery. These images, seen frequently at the U.S./Mexico border and in Ciudad Juarez, had a significant interactive effect with confederate suggestion to increase risk-taking. We concluded that the images used by drug cartels have important implications for their ability to influence the risky behaviors of others.

The literature thus far shows that exposure to religious references and social influences can lead to negative social behaviors (Bushman et al., 2007) or increased conformity (Van Cappellen et al., 2011). Generally, the current study supported the growing body of literature demonstrating that religious concepts, when combined with social influences, can lead to negative consequences. Previous studies showed the effect of religious references on abstract social behaviors (e.g., behavior intentions to give to charity or punishment to unknown individuals) that may be costly to others. The current study extended upon this by providing evidence that the effect of religious references on following the suggestions of others holds in an active risk-taking context. We used a direct assessment of risk-taking with the use of a valid risk task. Additionally, the risk taken in the current context is not abstract and the cost was to the individual participant and not to others.

Moving forward, we will continue to develop this program of research by more closely connecting the social behaviors affected by religion to real-world phenomena. We will test the extent to which the interactive effect of religious references and suggestions from other individuals influence the extent to which individuals will endorse legislation on social and moral issues of the day. To this end, we will investigate the extent to which exposing individuals to religious or non-religious imagery and a confederate bias increases support for an extreme stance on important legislation (e.g., use of international drones, use of enhanced interrogation techniques, or enforcement of sanctions to North Korea for nuclear drills). Our future research aims to shed light on how religious references and suggestions of others can influence the way in which individuals endorse policies with significant moral
outcomes. More broadly, this program of research will continue to develop our understanding of how individuals can be pushed to take extreme stances on important social issues.
References


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Appendix A
Demographics Questionnaire

Sex: Male Female
Age: _______ years

Ethnicity:
African-American ______
Caucasian, Non-Hispanic ______
Latino/a ______
Native American Indian ______
Asian-American ______
Other ______

If Latino, are you a:
Mexican National ______
Mexican American ______
Other ______
Please indicate: ____________
Not Hispanic or Latino ______

What language(s) do you speak?
English ______
English and Spanish ______
English and Other(s) ______
Please indicate which other language(s): ______________

Where were you born?
El Paso, Texas ______
Ciudad Juarez, Mexico ______
Other ______
Please indicate where: ________________

In what city do you currently live in?
El Paso, Texas ______
Ciudad Juarez, Mexico ______
Other ______
Please indicate where: ________________

How long have you lived in the city you currently reside in?
Less than 1 year ______
1-2 years ______
3-5 years ______
6-10 years ______
More than 10 years ______
If you currently do not live in Ciudad Juarez, Mexico, have you ever lived there before?
Yes ______ No ______
Currently live in Ciudad Juarez, Mexico ______

If you have ever lived in Ciudad Juarez, Mexico, how long did you live there for?
Less than 1 year ______ 1-2 years ______ 3-5 years ______ 6-10 years ______ More than 10 years ______
Never lived in Ciudad Juarez, Mexico ______

How often do you visit family in Juarez (or have family in Juarez visit you)?
Daily ______ Weekly ______ Monthly ______ Every few months ______ Yearly ______ Never ______

My family created a presence of Santa Muerte in the home
_____Strongly Disagree _____Disagree _____Neither Disagree or Agree _____Agree _____Strongly Agree

Frequency of religious service attendance:

_How often do you currently attend religious services?_
Never ______ On religious holidays only ______ Once a week and on religious holidays ______ At least once a week ______ Once a day ______

Frequency of religious service attendance as a child:

_How often did you attend religious services during your childhood?_
Never ______ On religious holidays only ______ Once a week and on religious holidays ______ At least once a week ______ Once a day ______

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Frequency of religious community activities:
How often do you currently participate in religious organization sponsored activities outside of religious services?
Never _____
Maybe once a year _____
A couple of times a year _____
Numerous (6+) times a year _____
I assist with the organization of these activities _____

Frequency of prayer:
How often do you pray independently?
Never _____
Very little _____
Once a week and on religious holidays _____
More than once a week _____
Several times a day _____

Frequency of prayer in a group setting:
How often do you pray as a group in the home (e.g., family prayer before a meal or blessing)?
Never _____
Very little _____
Once a week and on religious holidays _____
More than once a week _____
Several times a day _____

Private religious schooling:
Did you attend private religious schooling before attending college?
Yes (* please specify) _____  No _____
Yes, for:
_____Preschool or kindergarten
_____Grades 1-8
_____High school
_____Religious formation education

Religious upbringing and family customs:
*Please indicate your level of agreement or disagreement with the following statements*
I was raised in a family that stressed the importance of religious service attendance:
_____Strongly Disagree
_____Disagree
_____Neither Disagree or Agree
_____Agree
_____Strongly Agree
My family created a presence of religious symbols in the home:

_____ Strongly Disagree
_____ Disagree
_____ Neither Disagree or Agree
_____ Agree
_____ Strongly Agree

I was raised in a family that stressed the importance of prayer:

_____ Strongly Disagree
_____ Disagree
_____ Neither Disagree or Agree
_____ Agree
_____ Strongly Agree
Appendix B
Traditions and Modern Behaviors Writing Task
(positive non-religious condition)

Instructions Task 1
The following exercise is a writing task on traditions and behaviors. You will be shown an image of Frida Kahlo\(^3\) and be asked to indicate whether you recognize the person portrayed in the image, and to write about how you feel Frida Kahlo has impacted modern behaviors.

Please write 3-4 paragraphs about how you feel that traditions impact modern behaviors. Specifically, we would like you to discuss how the concept presented in the image impacts modern behavior. Please use the space below to write.

____________________________________________________________________________________
____________________________________________________________________________________
__________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

\(^3\) Participants were randomly assigned to one of four images and the image and name presented in the instructions reflected the condition to which they were assigned.
Appendix C

Balloon Analogue Risk Task

Instructions

Now you’re going to see 30 balloons, one after another, on the screen. For each balloon, you will use the mouse to click on the button that will pump up the balloon. Each click on the mouse pumps the balloon up a little more.

But remember, balloons pop if you pump them up too much. It is up to you to decide how much to pump up each balloon. Some of these balloons might pop after just one pump. Others might not pop until they fill the whole screen.

You get money for every pump. Each pump earns $0.05, but if a balloon pops, you lose the money you earned on that balloon. To keep the money from a balloon, stop pumping before it pops and click on the button labeled “Collect $$$”.

After each time you collect $$$ or pop a balloon, a new balloon with appear.

The goal of this task is to earn as much “money” as possible. The top 10% performers on this task will be entered into a raffle to win a $75.00 gift card.

At the end of the experiment, the experimenter will record your earnings for entry into the raffle.

Click the left mouse button to see the summary.

**Appendix D**

**Submissiveness Scale**

Circle a number from one to seven that best describes how you perceive yourself.

In general, I….

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Need the approval of others</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2) Do what others do</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>3) Want to form my own opinions</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>4) Want to be different from others</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>5) Am not afraid of providing criticism</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>6) Let myself be influenced by others</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>
Appendix E

Attitudes Toward Risk Questionnaire

Instructions: Indicate, using a 5-point scale, the degree to which each of the following statements describes you. Use the letter A if the statement is a very good description of you (like me) and the letter E to indicate that it does not describe you at all (not like me). Use remaining letters to indicate the varying degrees that the statement is like you or not like you.

<table>
<thead>
<tr>
<th>Like me</th>
<th></th>
<th></th>
<th></th>
<th>Not like me</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td>E</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(psychological risk items)

1) While I don’t deliberately seek out situations or activities that society disapproves of, I find that I often end up doing things that society disapproves of.
2) I often do things that I know my parents would disapprove of.
3) I often think about doing things that are illegal.
4) I do not let the fact that something is considered immoral stop me from doing it.
5) I often think about doing things that I know my friends would disapprove of.
6) I often seek out situations or activities that society does not approve of.
7) I do not let the fact that something is illegal stop me from doing it.
8) I often think about doing things that I know my parents would disapprove of.
9) I often think about doing things that I know society would disapprove of.
10) I often think about doing things that are considered immoral.

(physical risk items)

11) I like the feeling that comes with taking physical risks.
12) I consider myself a risk-taker.
13) Being afraid of doing something new often makes it more fun in the end.
14) The greater the risk the more fun the activity.
15) I like to do things that almost paralyze me with fear.
16) I like the feeling that comes with taking psychological or social risks.
17) While I don’t deliberately seek out situations or activities that involve physical risk, I often end up doing things that involve physical risk.
18) I like the feeling that comes from entering a new situation.
19) I often think about doing activities that involve physical risk.
20) I often think about doing things that would arouse a great deal of fear or anxiety for me.
Vita

Jessica Marie Shenberger Trujillo was born on August 15, 1983 in Chicago, Illinois. She received her Bachelor’s of Arts degree with honors from the University of Illinois at Chicago in 2007. During that time, she was a Ronald E. McNair Scholar and received an undergraduate award from the Honors College. Her interests in social psychology were fostered by her participation in a research lab that focused on investigating morality and justice. Jessica entered the Psychology Doctoral program at the University of Texas at El Paso in the fall of 2010 to continue her research in the area of morality, religion, and intergroup conflict. Since then, she has conducted research on the effect of religious references on social behaviors. Additionally, she has collaborated on a book chapter on prejudice reduction. For the 2013 Commencement, Jessica received the Outstanding Graduate Student in Psychology award.

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