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Religiosity enhances emotion and deontological choice in moral dilemmas

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ABSTRACT

While early psychological theories debated the relation between religiosity and moral decision making, more recent work approached this relation on empirical grounds using multidimensional measures of religiosity and moral dilemmas. The present study investigated the influence of individual differences in religious thoughts and feelings, social desirability and mood on emotions and decisions in moral dilemmas that pit social welfare against harming another person. In order to increase emotional salience, moral dilemmas were framed as personal choices. Results indicated that the tendency to seek religious guidance in everyday life, and social desirability positively predicted deontological choices (i.e., refusing to harm one person in order to save several people). In addition, individual differences in religious feelings positively predicted negative emotion presence in these moral dilemmas. These results highlight the motivational and emotional dimensions of religiosity that influence moral choice and emotional experience in moral dilemmas.

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1. Introduction

In the last three decades, the relation between religiosity and moral decision making has been debated by psychologists. While some early perspectives saw religiosity and moral decisions as unrelated (Kohlberg, 1981), others acknowledged possible interactions between the two (Turiel, 2002). More recent work was in a better position to approach this relation, due to methodological and theoretical advances in the study of moral decisions and individual differences in religiosity. On the one hand, the extensive use of moral dilemmas in laboratory studies (Christensen & Gomila, 2012) allowed researchers to investigate the complex interplay between norm-based reasoning and emotional intuitions in moral decision making (Cushman, Young, & Greene, 2010). On the other hand, individual difference research emphasized the multidimensional nature of religiosity (Allport & Ross, 1967; Saroglou, 2011) and identified cognitive, emotional and motivational facets of this construct (e.g., Joseph & DiDuca, 2007). These advances highlighted the multiple links that may exist between different dimensions of religiosity and moral decision making. To our knowledge, this is the first study that takes a multidimensional approach to religiosity and investigates its influence on emotions and decisions in moral dilemmas that challenge the religious imperative of not harming others.

1.1. Moral dilemmas, emotion and moral choice

Originating in philosophy (e.g., "Trolley problem") (Thomson, 1985), moral dilemmas have been widely used to study moral judgment and decision-making in psychology and cognitive neuroscience (Christensen & Gomila, 2012; Cushman & Greene, 2011). In one type of dilemma (i.e., "harm to save" or H2S), saving the lives of other people is pitted against harming one person (Greene, Nystrom, Engell, Darley, & Cohen, 2004; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001). There are two possible response alternatives, consistent with two influential moral philosophies: refusing to harm another person, no matter the consequences (i.e., deontological, norm-focused decision) (Kant, 1797/1959); or saving the lives of several people at the cost of harming one person (i.e., utilitarian, consequence-focused decision) (Mill, 1861/1969).

Early in the course of moral dilemmas research, pioneering work such as the social-intuitionist theory (Haidt, 2001) and the affect infusion models (Forgas, 1995) drew attention to the involvement of emotions in moral decision making. In H2S moral dilemmas, deciding between deontological and utilitarian alternatives may be particularly difficult not only because harming another person is against social and religious norms, but also because such actions are typically perceived as unpleasant

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(Cushman & Greene, 2011). Pondering on dilemmas involving harmful actions is associated with moderately intense negative emotions including fear, sadness, compassion, guilt, anger, disgust, regret, guilt and contempt (Szekely & Miu, 2015). Moreover, asking individuals to simulate inflicting harm with personal force and intention triggers strong negative emotional responses manifested at the subjective and physiological levels (Cushman, Gray, Gaffey, & Mendes, 2012; Greene et al., 2009).

Researchers have recently made an interesting distinction between abstract moral judgment (i.e., *Is it morally acceptable...?*) and personal moral choice (i.e., *Would you do it...?*), by changing the perspective from which moral decision is made (Tassy, Oullier, Mancini, & Wicker, 2013). Due to increased self-relevance, moral choice may be more emotionally salient than moral judgment (Tassy, Oullier et al., 2013). Indeed, moral choice, but not moral judgment, is more sensitive to manipulations of closeness (e.g., brother/friend vs. stranger) of one's relationship to the potential victim of the harmful action (Kurzban, DeScioli, & Fein, 2012; Tassy, Oullier et al., 2013). Moreover, people characterized by emotional callousness (i.e., psychopathic traits) show higher willingness to perform the harmful action, although they judge it morally unacceptable (Tassy, Deruelle, Mancini, Leistedt, & Wicker, 2013). Therefore, moral choice may be particularly appropriate for studying emotions and decisions in moral dilemmas and their connections to individual differences such as religiosity.

1.2. Religiosity and moral judgment

Recent studies on moral judgment indicate that individual differences in religiosity may contribute to response tendencies in moral dilemmas. For example, religious convictions (Antonenko Young, Willer, & Keltner, 2013) and religious practices (e.g., attending religious services, praying) (Conway & Gawronski, 2013) are associated with reduced endorsement of H2S actions and deontological moral judgments. When explaining why certain moral transgressions are wrong, religious individuals focus on norm violation rather than action consequences (Piazza, 2012). Functional neuroimaging studies showed that in comparison to atheists, people with religious beliefs display increased neural activity in regions such as anterior cingulate cortex and superior temporal sulcus when making deontological judgments in moral dilemmas (Christensen, Flexas, de Miguel, Cela-Conde, & Munar, 2014).

These recent studies have contributed to a renewed interest in the influence of religiosity on moral decision making. However, they all focused on abstract judgments in moral dilemmas, raising the question of whether religiosity might also influence moral decisions when they are framed as personal choices (Szekely & Miu, 2015; Tassy, Oullier et al., 2013). In addition, all previous studies employed global assessments of religiosity such as holding religious beliefs or practicing religious rituals. In light of recent developments in religiosity models, it remains unclear which religiosity dimension (e.g., cognitive, emotional, motivational) might influence moral choices. Finally, these studies did not investigate the influence that religiosity may have on emotions associated with decision making in moral dilemmas.

1.3. The present study

Therefore, the present study investigated the relations between religiosity, emotional experience and moral choice in H2S moral dilemmas, in a Christian sample. For this purpose, we used a multidimensional approach to religiosity, developed by Joseph and DiDuca (2007) for Christian population, which assesses thoughts and feelings associated with belief in God. This approach is based on four dimensions of religiosity that capture cognitive (i.e., conviction in and preoccupation with religious beliefs), emotional (i.e., religious feelings) and motivational aspects of religiosity (i.e., commitment to follow religious norms in everyday behavior) (Joseph & DiDuca, 2007). In this study, participants considered moral dilemmas from a personal perspective and they reported emotional experience and moral choice.

The main focus of the study was on individual differences in religiosity, but we were also interested in the effects of social desirability and mood on emotions and decisions in moral dilemmas. Previous studies indicated that thinking of God was associated with increased concern for social image (Gervais & Norenzayan, 2012) and suggested that religiosity may serve as means for manifesting socially desirable behavior (Sedikides & Gebauer, 2010). Pre-existing mood was also included in the current investigation, for two reasons. First, negative mood was associated with deontological response tendencies (Starcke, Polzer, Wolf, & Brand, 2011) and positive mood had the opposite effect in moral dilemmas (Valdesolo & DeSteno, 2006). Second, pre-existing mood is known to affect incidental emotions (Neumann, Seibt, & Strack, 2001). Therefore, individual differences in social desirability and mood were also assessed in this study.

2. Method

2.1. Participants

Three hundred and seventeen participants (265 women; age: 23.1 ± 3.8 years) volunteered for this study. They were all students of different specialties (e.g., Psychology, Law, Theology, Medicine), who responded to campus advertisements. More than 93% of the participants reported Christianity as their religious affiliation; less than 7% of the remaining participants reported no religious affiliation. In terms of religious confessions, participants were 70.7% Orthodox, 7.9% Roman Catholic, 7.6% Greek Catholic, 1.4% Reformed and 5.7% from other religious confessions (e.g., Baptist, Pentecostal). Participants completed questionnaires and moral dilemmas online, through a secure website. Prior to study participation, written informed consent was obtained from all the volunteers.

2.2. Materials

2.2.1. Moral dilemmas

Twelve H2S moral dilemmas were used in this study, which were previously shown to induce emotional conflict (Greene et al., 2001; Greene et al., 2004). The participants were asked if they would choose to harm a person in order to save several other people (including themselves, in some of the dilemmas), and they answered with "yes" (i.e., utilitarian decision) or "no" (i.e., deontological decision). Therefore, they considered these hypothetical situations from a personal perspective and reported their moral choice. For example (*Sophie's choice* dilemma, adapted from Greene et al., 2004):

> It is wartime and you and your two children, ages eight and five, are living in a territory that has been occupied by the enemy. At the enemy's headquarters is a doctor who performs painful experiments on humans that inevitably lead to death.
>
> He intends to perform experiments on one of your children, but he will allow you to choose which of your children will be experimented upon. You have twenty-four hours to bring one of your children to his laboratory. If you refuse to bring one of your children to his laboratory he will find them both and experiment on both of them.
>
> Would you bring one of your children to the laboratory in order to avoid having them both die?

2.2.2. Religiosity assessment

Individual differences in religiosity were assessed with Dimensions of Religiosity Scale (DRS) (Joseph & DiDuca, 2007). This scale has 20 items related to four dimensions of religious thoughts and feelings, which are suitable for Christian participants: (1) Conviction, defined as being strongly convinced of the authenticity of religious beliefs (e.g., *I am sure that Christ exists*; Cronbach's alpha = 0.96 in this sample); (2) Preoccupation, that is, frequently thinking about the teachings of God (e.g., *my thoughts often drift to God*; Cronbach's alpha = 0.93 in this sample); (3) Emotional Involvement, defined as being emotionally attached to one's beliefs (e.g., *I feel happy when I think of God*; Cronbach's alpha = 0.93 in this sample); and (4) Guidance, defined as turning to God for guidance in everyday life (e.g., *I cannot make important decisions without God's help*; Cronbach's alpha = 0.86 in this sample). Participants were instructed to rate how much they agreed with each item on a scale from 1 (strongly disagree) to 5 (strongly agree).

2.2.3. Social desirability

We measured social desirability using the 17-item Social Desirability Scale (SDS-17) (Stöber, 2001). Participants were asked to rate each item with "true" or "false", by adopting a personal perspective (e.g., *I always accept others' opinions, even when they don't agree with my own*; Cronbach's alpha = 0.73 in this sample).

2.2.4. Mood

The 41-item version of the Positive and Negative Affect Schedule (PANAS) (Watson & Clark, 1994) was used to measure mood before starting the moral dilemmas task. Internal consistencies were 0.93 for Positive Affect and 0.94 for Negative Affect in this sample.

2.3. Procedure

First, participants filled in the self-report questionnaires (i.e., DRS, SDS-17, and PANAS). Then, they received instructions that a series of situations will be described and they will have to imagine themselves in each of those situations as vividly as possible, and choose between two courses of action, as they would in reality. The order in which the dilemmas were displayed can be found in Table 1. After each dilemma, the participants were requested to indicate if they felt an emotion while they were deliberating on the situation (yes/no). If they reported having felt an emotion during a dilemma, they also had to rate: (1) emotional arousal (5-point Likert scale from 1, "not at all intense" to 5, "very intense") and (2) emotional valence (5-point Likert scale from 1, "unpleasant" – 5, "pleasant"). Participants were also asked to rate their success in personally engaging in the situation described by each moral dilemma (5-point Likert scale from 1, "low" to 5, "high").

2.4. Statistical analyses

Analyses focused on measures of emotion and decision both across dilemmas and in each dilemma. Across dilemmas, we used percentage of deontological choices and emotion presence, as well as mean emotional arousal and emotional valence. Differences in moral choices and emotion presence were analyzed using chi-squared tests, whereas differences in emotional arousal and emotional valence were analyzed using one-sample *t*-tests relative to midrange scores on the corresponding Likert scales. Spearman's rank correlation (r_s) was used to analyze relations between emotions and moral choice, which are ordinal variables suited for this analysis. Considering that emotional arousal and emotional valence were rated only when emotion was present, the listwise deletion method was employed in order to handle missing data in correlation analyses.

We used multiple logistic regression fitted with generalized estimating equations (GEE) method to test whether the four dimensions of religiosity (i.e., Conviction, Preoccupation, Emotional Involvement, and Guidance), social desirability and mood (i.e., Positive Affect, Negative Affect) predicted emotion presence (i.e., emotion presence coded with 1, emotion absence coded with 0) and moral choice (deontological responses coded with 1, utilitarian responses coded with 0). The GEE method was employed to account for within-participant correlations, in line with statistical guidelines (Zeger & Liang, 1986; Zeger, Liang, & Albert, 1988; see also Hanley, Negassa, Edwardes, & Forrester, 2003) and previous research using moral dilemmas (e.g., Koenigs et al., 2007; Tassy, Deruelle et al., 2013). This allowed us to examine individual differences in moral choice while accounting for within-participant response correlations in dilemmas. GEE requires equal number of observations between participants, so we could not run this analysis on emotional arousal and emotional valence scores that were rated only when emotion was present.

All statistical analyses were performed using SPSS.

3. Results

Participants reported increased levels of engagement across dilemmas ($M = 3.7$, $SD = 1.07$). One-sample *t*-tests indicated that

Table 1
Personal engagement, deontological responses and emotional experience in moral dilemmas.

Moral dilemma	Personal engagement[a] (mean ± SEM)	Deontological responses[b] (%)	Emotion presence (%)[b]	Emotional arousal[a] (mean ± SEM)	Emotional valence[a] (mean ± SEM)
Sophie's choice	3.83 ± 0.05**	71.61**	92.74**	3.82 ± 0.88**	1.65 ± 1.04**
Modified Lifeboat	3.87 ± 0.05**	60.25**	85.17**	3.68 ± 0.93**	1.87 ± 1.13**
Crying Baby	4.06 ± 0.06**	94.32**	88.64**	4.25 ± 0.83**	1.54 ± 0.99**
Modified Bomb	3.73 ± 0.06**	37.22**	76.66**	3.56 ± 0.95**	1.82 ± 0.96**
Euthanasia	3.69 ± 0.06**	54.26*	78.86**	3.77 ± 1.01**	1.63 ± 0.09**
Lawrence of Arabia	3.37 ± 0.06**	58.68**	69.09**	3.57 ± 0.98**	1.68 ± 0.92**
Footbridge	3.67 ± 0.06**	93.06**	74.45**	3.65 ± 0.99**	1.62 ± 0.93**
Sacrifice	3.79 ± 0.06**	92.43**	84.86**	3.96 ± 1.02**	1.42 ± 0.9**
Modified Safari	3.52 ± 0.06**	40.38**	72.87**	3.8 ± 0.96**	1.60 ± 0.92**
Submarine	3.63 ± 0.06**	35.33**	74.13**	3.6 ± 1.08**	1.57 ± 0.9**
Vaccine Test	3.75 ± 0.06**	36.28**	74.45**	3.66 ± 1.04**	1.8 ± 1.02**
Vitamins	3.6 ± 0.06**	74.76**	72.87**	3.67 ± 0.96**	1.76 ± 1.02**

Note: Abbreviations: SEM = standard error of the mean.
[a] Significance levels are based on one-sample *t*-tests. Means were compared to the midrange scores on the corresponding Likert scale.
[b] Significance levels are based on chi-square tests.
* $p < 0.05$.
** $p < 0.01$.

Table 2
Logistic regression coefficients estimating moral choices based on dimensions of religiosity, social desirability and mood.

Predictors	B[a]	SE B	Wald χ^2	Exp(B)
Conviction (DRS)	−0.004	0.01	0.04	0.99
Preoccupation (DRS)	−0.008	0.02	0.11	0.99
Emotional Involvement (DRS)	0.011	0.03	0.12	1.01
Guidance (DRS)	0.07**	0.02	7.63	1.07
Social Desirability (SDS-17)	0.05**	0.01	7.1	1.05
Positive Affect (PANAS)	0.005	0.01	1.04	1.01
Negative Affect (PANAS)	0.006	0.004	3.28	1.01

Note: Deontological choices were coded with 1, utilitarian choices were coded with 0.
Abbreviations: B = unstandardized regression coefficient; DRS, Dimensions of Religiosity Scale; PANAS, Positive and Negative Affect Schedule; SDS-17, Social Desirability Scale; SE = standard error; Exp, exponential.
[a] Coefficients from logistic regression fitted with the GEE method.
** $p < 0.01$.

Table 3
Logistic regression coefficients estimating emotion presence based on dimensions of religiosity, social desirability and mood.

Predictors	B[a]	SE B	Wald χ^2	Exp(B)
Conviction (DRS)	0.17	0.03	0.28	1.02
Preoccupation (DRS)	−0.04	0.03	0.86	0.96
Emotional Involvement (DRS)	0.11*	0.05	4.14	1.12
Guidance (DRS)	−0.08	0.04	2.63	0.92
Social Desirability (SDS-17)	0.004	0.03	0.22	1
Positive Affect (PANAS)	−0.006	0.008	0.46	0.99
Negative Affect (PANAS)	0.006	0.006	0.89	0.99

Note: Emotion presence was coded with 1, emotion absence was coded with 0.
Abbreviations: B = unstandardized regression coefficient; DRS, Dimensions of Religiosity Scale; PANAS, Positive and Negative Affect Schedule; SDS-17, Social Desirability Scale; SE = standard error; Exp, exponential.
[a] Coefficients from logistic regression fitted with the GEE method.
* $p < 0.05$.

personal engagement was significantly higher compared to midrange scores in all dilemmas (Table 1).

Across dilemmas, 62.38% of the choices were deontological (Table 1). Chi-squared tests indicated that participants made significantly more deontological choices than utilitarian choices in most dilemmas (Table 1), except *Modified Bomb*, *Modified Safari*, *Submarine* and *Vaccine Test*, in which utilitarian choices were more frequent.

Across dilemmas, 78.73% of participants reported having felt an emotion. As shown in Table 1, chi-square tests confirmed that emotion presence was significant in all the dilemmas. Emotion presence did not significantly correlate with deontological choices across dilemmas ($r_s = 0.01$, $p = 0.82$).

When participants reported that emotion was present, they also rated its emotional arousal and emotional valence. Across dilemmas, emotional arousal was increased ($M = 3.76$, SD = 0.99) and emotional valence was in the negative range ($M = 1.66$, SD = 0.98). One-sample t-tests confirmed that emotional arousal was significantly higher than midrange scores and emotional valence was significantly lower than midrange scores (i.e., toward "unpleasant") in all dilemmas (Table 1). Across dilemmas, deontological responses did not significantly correlate with mean emotional arousal ($r_s = -0.01$, $p = 0.80$) and mean emotional valence ($r_s = 0.08$, $p = 0.13$).

Multiple logistic regression fitted with the GEE method, with religiosity scores (i.e., Conviction, Preoccupation, Emotional Involvement, and Guidance), social desirability and mood (i.e., Positive Affect, Negative Affect) as predictors indicated that religious Guidance and social desirability were associated with increased odds of making deontological choices (Table 2). The other dimensions of religiosity and mood were not significant predictors of moral choices.

A similar analysis indicated that religious Emotional Involvement was a significant positive predictor of emotion presence in moral dilemmas (Table 3). The other dimensions of religiosity, social desirability and mood were not significant predictors.

4. Discussion

Based on a relatively large Christian sample, this study yielded two main results. First, individual differences in seeking religious guidance from God (i.e., religious motivation) and social desirability were positively related to deontological choices in moral dilemmas. Second, religious emotional involvement positively predicted emotion presence in moral choice.

Previous studies reported that religious individuals increasingly endorse deontological actions in moral dilemmas framed as abstract moral judgment (i.e., *Is it morally acceptable...?*) (Antonenko Young et al., 2013; Christensen et al., 2014; Conway & Gawronski, 2013). Moving beyond global measures of religiosity such as holding a religious belief or practicing religious rituals, this study assessed religious thoughts, feelings and motivational tendencies. In addition, we focused on personal choice (i.e., *Would you do it...?*) in moral dilemmas, which was recently suggested to offer more fertile ground for the study of emotions and moral decisions. Results indicate that it is not religious beliefs *per se* which bias moral choice, but rather their motivational influence. The tendency to use religious beliefs in everyday behavior, but not conviction, preoccupation or feelings associated with these beliefs was positively related to deontological choices in moral dilemmas. These results highlight the multidimensional nature of the relation between religiosity and moral decisions and show for the first time that the influence of religiosity (i.e., religious motivation) extends to moral choice.

This study also found that social desirability was associated with deontological choices. Based on these results, it is not possible to indicate whether the effects of social desirability and religious motivation are independent or not. In order to account for within-participant response correlations, we used multiple regression analysis fitted with GEE to estimate moral choices based on individual differences. Notably, this method does not allow describing the effect of a predictor (e.g., religiosity) while controlling for the others (e.g., social desirability). Considering that religiosity has been related to increased preoccupation for social image (Gervais & Norenzayan, 2012) and social compliance (Sedikides & Gebauer, 2010), future studies may investigate whether social desirability moderates the relation between religiosity and moral choice.

Emotions in moral dilemmas were also investigated in this study. Framing decisions as personal choices may enhance emotional salience of moral dilemmas (Szekely & Miu, 2015; Tassy, Oullier et al., 2013). Indeed, we found that emotion was present in almost 80% of the cases. When present, emotional experience had higher than moderate intensity and negative valence. This is in line with a previous study (Szekely & Miu, 2015) that reported the experience of negative emotions such as fear and sadness during moral choice in H2S dilemmas. However, these results did not support an association between emotional experience and moral choices, possibly because of the increased emotional salience of moral dilemmas and the limited variance of emotions relative to decisions. Ceiling effects may have obscured the relation between emotion and moral decisions in the present study. In addition, the association between emotion and moral choice may have been affected by the fact that four dilemmas differed from the rest of the battery, with the majority of responses being utilitarian.

We found that emotion presence was positively predicted by religious feelings, but not other dimensions of religiosity, social desirability and mood. This finding is in line with other studies showing that religious individuals have higher emotional reactivity to moral transgressions (Christensen et al., 2014; Hofmann, Wisneski, Brandt, & Skitka, 2014), but do not clarify whether reactivity is specific to moral dilemmas. Future studies might investigate this issue using control dilemmas that do not involve moral transgressions (e.g., Moll, de Oliveira-Souza, Bramati, & Grafman, 2002). In addition, experimental studies would allow researchers to investigate whether emotions are mediators between religiosity and decisions in moral dilemmas (Forgas, 1995; Haidt, 2001).

There are two potential limitations of this study, related to the self-report measure of religiosity and the use of moral dilemmas. Regarding religiosity, future investigations could incorporate recent developments in the assessment of religiosity, which focus on daily accounts of religious activities (Hardy, Zhang, Skalski, Melling, & Brinton, 2014). Behavioral measures (e.g., daily praying) might more reliably reflect religious motivation, in comparison to self-report. In addition, responding to moral dilemmas requires participants to make the assumption that the described situations refer to a "closed world" and there is no other way around the two courses of action (Bazerman & Greene, 2010; Bennis, Medin, & Bartels, 2010). Although this "closed world assumption" may seem artificial and interfere with personal engagement, dilemmas create a conflict between the need to prioritize social welfare and the aversion towards committing a moral transgression, and have been widely used in moral psychology as an insightful approach to studying the involvement of emotion in moral decision. However, a recently developed methodological alternative is based on experience sampling approaches to everyday moral behavior (Hofmann et al., 2014). Therefore, future studies might consider these methodological alternatives to self-reported religiosity and moral dilemmas.

In conclusion, this study dissociated two distinct dimensions of religiosity that separately influence moral choice and emotional experience during H2S moral dilemmas. This underscores the multifaceted nature of the relations between religiosity, emotions and moral decision making, offering a nuanced perspective for future individual difference and experimental research on this topic.

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