# Religiosity and the motivation for social affiliation☆,☆☆

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## ABSTRACT

Although universal, the motivation to affiliate can vary as a function of individual differences and of the characteristics of the target. Three studies explored the extent to which religious beliefs and identity are related to social affiliation motivation. Because most religions advocate affiliation and provide opportunities for frequent experiences of affiliation, we reasoned that religious people might show greater affiliation motivation in everyday attitudes and behaviors. We found that religiosity was positively related to implicit and behavioral measures of general social affiliation (Studies 1 and 2). However, manipulating the identity of the affiliation target revealed that when affiliating might not lead to positive outcomes, the relation between religiosity and social affiliation disappeared (but did not reverse). In Studies 2 and 3, when the target of the affiliation was explicitly identified as a member of a threatening out-group (atheist), religiosity did not predict affiliation behaviors. We discuss the mechanisms by which religiosity motivates and constrains social affiliation and the potential implications for social influence and intergroup processes.

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## 1. Introduction

Affiliation motivation is defined as a concern with establishing, maintaining, or restoring positive interactions with another person or group. Social affiliation is characterized by a desire to interact and by pleasure in being with others and is one of human beings' basic and universal motivations (McClelland, 1987). Yet, the extent to which a person is motivated to affiliate differs across people (Dufner, Arslan, Hagemeyer, Schönbrodt, & Denissen, 2015; Hill, 2009). For example, early research showed that birth order predicts social affiliation motivation. Only, first-born, and later-born children have progressively higher affiliation motivation, probably because later-born children have less undivided attention from their parents (Conners, 1963). Affiliation

motivation also varies based on ethnicity. Asian Americans appear to have higher affiliation motivation than Whites, a finding that may reflect the collectivistic values present in many Asian countries (Pang & Schultheiss, 2005). Women also appear to have higher affiliation motive compared to men as indexed by both self-report and implicit measures (Drescher & Schultheiss, 2016). Finally, natural and medical variations in hormones are associated with changes in affiliation motivation. For example, in normally cycling women, natural variations in progesterone are positively correlated with affiliation motivation, with increases in progesterone priming increased affiliation motivation. In addition, women taking oral contraceptives, which typically contain progesterone-like hormones, have higher implicit affiliation motivation than women who do not take oral contraceptives and than men (Schultheiss, Dargel, & Rohde, 2003). The polypeptide oxytocin has also received much attention because of its role in social affiliation processes more generally (MacDonald & MacDonald, 2010).

In the present paper, we examine whether people's religious beliefs and identities play a role in the motivation to socially affiliate, as assessed with implicit and behavioral measures. Specifically, we investigate whether individual differences in religiosity predict affiliation motivation and examine the extent to which this general effect is moderated by the religious identity of the target of affiliation.

### 1.1. Religiosity and individual differences in affiliation motivation

Social affiliation is a core feature of most religions. In fact, the word "religion" comes from the Latin word, "religare," which means "to

bind." One interpretation is that of binding people together and humans with gods and their set of obligations. In most psychological and sociological theories of religion, one consistently finds a basic social dimension in addition to the introspective dimension of religion manifested in individual prayer or meditation (Atran & Henrich, 2010; Durkheim, 1912; James, 1958 on institutional religion). Religiosity has been found to be generally related to interdependence and collectivism, both in individualistic and collectivistic cultures (see for a review, Saroglou & Cohen, 2013). Indeed, religion in itself may be partly a response to people's need to affiliate (e.g., Epley, Akalis, Waytz, & Cacioppo, 2008), providing a way to connect people with each other (and with God). Furthermore, as Durkheim (1912) suggested, affiliation may fuel religion itself, and a consequence of religious rituals is to reinforce shared beliefs and bind people to the ideals of the group (Páez, Rimé, Basabe, Wlodarczyk, & Zumeta, 2015; Rossano, 2012; Van Cappellen & Rimé, 2014).

Being religious appears to bring more frequent opportunities for social affiliation. Around the world, millions of people gather in groups for religious services at least a few times a year and, for many, every week. Even outside the place of worship, religious individuals are invisibly bonded by their common beliefs. Research has shown that religious involvement is related to having a larger social network as well as greater frequency of contact and greater intimacy with members of the social network (Ellison & George, 1994; Hayward & Krause, 2014; Idler, 1987). In a longitudinal study that followed a representative sample of adults in a California county, those who attended religious services at least weekly in 1965 reported greater social involvement and size of social network in 1994 compared to less frequent or non-attendees (Strawbridge, Shema, Cohen, & Kaplan, 2001).

Although these studies provide preliminary evidence that being religious is related to social affiliation, they are limited by their reliance on self-report and by their failure to distinguish between social networks that are and are not based on religion. Surprisingly, we know very little about the link between religiosity and the motivation for social affiliation in day-to-day attitudes and behaviors outside places of worship.

In the present studies, we investigated whether religiosity is related to general social affiliation motivation. Theories often distinguish between two motives for social affiliation (Gable & Berkman, 2008), which yields different expectations regarding whether the relation between religiosity and affiliation motivation should be negative or positive. One motive is avoidance-oriented (i.e., aiming to reduce loneliness and disconnection), and one is approach-oriented (i.e., aiming for affiliation, closeness, and positive outcomes). Research has mostly focused on how people turn to religion as a coping mechanism to reduce loneliness, an avoidance-oriented affiliation motive. A series of laboratory experiments revealed that people who were primed to feel lonely or high in need to belong subsequently reported greater religiosity (Burris, Batson, Altstaedten, & Stephens, 1994; Epley et al., 2008; Rokach & Brock, 1998) and a stronger intention to engage in religious behaviors (Aydin, Fischer, & Frey, 2010). Much of the research on religion and social affiliation has therefore been based on a deficit model that assumes that turning to religion is partly driven by loneliness and inadequate affiliation. This research is consistent with an early conceptualization of affiliation motivation suggesting that the motive to affiliate is activated primarily in response to a deficit in affiliation (Shipley & Veroff, 1952). Importantly, this conceptualization assumes that the motivation for affiliation should be lower for people who have close relationships with others. If so, religious individuals would not seek to affiliate with others at the same rate as less religious people because their desire for social contact and connections are already satisfied through their religious networks.

Although most work has attributed affiliation primarily to this avoidant affiliation motive (e.g., avoidance of rejection and exclusion), the conclusion that experiences of affiliation would predict lower affiliation motivation is not consistent with Boyatzis (1973) observations. He proposed an approach-oriented affiliation motive, independent of the avoidance-oriented affiliation motive, that reflects people who are motivated by a desire for close, harmonious interactions and the potential positive outcomes of social affiliation. Many authors use the term "intimacy motivation" instead of affiliation motivation to specifically target this approach oriented motivation for warm and close relationships (e.g., McAdams & Constantian, 1983). According to this conceptualization, the existence of close relationships should stimulate further social affiliation instead of satiating the desire to affiliate. From this perspective, religious individuals, bolstered by their frequent experiences of social affiliation and by the affiliative nature of their religious beliefs would continue to seek affiliation in their everyday lives. We tested the relationships between religiosity and affiliation motivation in Studies 1 and 2.

### 1.2. Religious identity of the affiliation target

People high in affiliation motive desire pleasant interactions and relationships. Therefore, if the target of affiliation does not afford potentially pleasant outcomes, affiliation motivation may be undermined. This notion is in line with evidence showing that people high in affiliation motivation desire to be around like-minded people and tend to avoid conflict (Weinberger, Cotler, & Fishman, 2010). It is also consistent with what we know about how religious individuals interact with similar and dissimilar others. Both history and recent headlines show in dramatic and often deadly ways that religion does not always promote affiliation. In fact, religion often provides a basis for rejecting other people, particularly those who are not a member of one's own religious faith. For example, research on prosociality has shown that religious priming and trait religiosity are related to prosocial behaviors as long as the target to be helped is not a member of an out-group that threatens the person's religious values (e.g. homosexuals, feminists, Blogowska & Saroglou, 2011). When the target is an in-group member or when the target's identity is not specified, religion seems to support prosocial actions such as forgiveness (e.g., Saroglou, Corneille, & Van Cappellen, 2009), suggesting that it might promote affiliation motivation as well. However, in the case of prejudice and antisocial attitudes, religiosity is related to greater prejudice toward value-threatening out-groups (e.g., Johnson, Rowatt, & LaBouff, 2012). Further, in another study, religiosity was related to antisocial behavior against a gay target but not toward a neutral target (Blogowska, Lambert, & Saroglou, 2013).

Regarding the motivation for social affiliation, we hypothesized that if religiosity is related to greater general motives to socially affiliate, this relation should disappear (or perhaps even reverse) when the target is explicitly identified as a member of an out-group. This intergroup bias might take two forms (for a review, see Hewstone, Rubin, & Willis, 2002). The bias could reflect either in-group favoritism in which religious individuals affiliate more with members of their in-group and ignore or exclude members of the out-group, or the bias could involve out-group derogation in which religious individuals reject outgroup members.

In general, the in-group bias takes the milder form of in-group favoritism rather than out-group derogation (Brewer, 1999). People often show an absence of positive feelings toward out-groups rather than a presence of strong negative feelings. Accordingly, we hypothesized that religiosity would be related to the presence of social affiliation toward neutral and in-group targets and the absence of social affiliation toward an out-group target who does not afford the potentially good outcomes of social affiliation. However, given that out-group derogation is partially driven by threat (Riek, Mania, & Gaertner, 2006), we reasoned that the style of religious beliefs might change these predictions. In Study 3, we tested whether religious fundamentalism, the belief that one's faith is true and should be defended against evil forces that attack it (Altemeyer & Hunsberger, 2005), is related to both out-group derogation and in-group favoritism.

*1.3. Overview of research*

Across three Studies, we tested the extent to which religiosity is related to implicit and behavioral social affiliation. Religiosity is positively related to social desirability bias (Sedikides & Gebauer, 2010), which raises concerns about self-report measures of social affiliation motives. Moreover, motives often operate outside of consciousness (McClelland, 1987). To minimize demand characteristics and self-presentation bias, we measured social affiliation motives using unobtrusive and behavioral measures. First, reasoning that people who are motivated to affiliate should initiate social interactions, we deployed a behavioral measure of physical closeness (adapted from Holland, Roeder, Brandt, & Hannover, 2004). In this behavioral task, physical closeness to another person is used as an indicator of desire for social closeness and as a precursor for any subsequent interaction. In addition, we used a variant of the Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998) to measure how appealing people find social affiliation (Slabbinck, De Houwer, & Van Kenhove, 2012).

In Study 1, we examined the basic idea that religious people tend to affiliate more with others than nonreligious people (approach-oriented motive). We undertook Study 2 to conceptually replicate the findings of Study 1 using a different (implicit) measure of general social affiliation and to test in a separate task whether the link between religiosity and affiliation is moderated by the identity of the target. We hypothesized that the general relation between religiosity and social affiliation would not hold toward a value-threatening out-group (atheists). With Study 3 we sought to replicate the interpersonal findings of Study 2 while investigating affiliation biases toward an in-group, out-group, and neutral target.

## 2. Study 1

Study 1 tested the hypothesis that religiosity is generally related to social affiliation behaviors. We used a waiting room task to measure participants' physical distance/closeness to another (fictitious) participant (adapted from Holland et al., 2004). Research has shown that physical and social distances are conceptually related (Bar-Anan, Liberman, Trope, & Algom, 2007) and that people who are high in affiliation motivation interact physically closer to other people (McAdams & Powers, 1981). In addition, physical closeness is a pre-requisite for affiliation and thus provides an index of a facilitative social behavior.

*2.1. Method*

*2.1.1. Participants*

A community sample of 239 middle-aged adults (65.3% women; $M_{Age} = 45.8$, $SD_{Age} = 8.0$) took part in a larger study on meditation for monetary compensation (see published findings here, authors name blinded). The study took place in the community-based laboratories of a southeastern U.S. University and was approved by the relevant Institutional Review Board. The majority of participants self-identified as White/Caucasian (86.1%), and the remaining participants identified as Black/African American (11.3%), or Asian (2.5%); 5% identified as Hispanic. Participants were Christian (60.6%), Muslim (0.4%), Buddhist (0.8%), Jewish (2.1%), agnostic (16.9%), atheist (11%), or other (8.1%).[1] Three participants did not report their religious affiliation.

*2.1.2. Procedure*

Participants arrived in a laboratory suite composed of multiple rooms. For the purposes of the larger study, participants were first randomly assigned to receive either oxytocin nasal spray or a placebo. They were then randomly assigned to an introduction to mindfulness meditation or loving-kindness meditation. The measure of social distance/closeness was taken at the very end of the laboratory session and was not affected by conditions.[2] Other questionnaires and tasks, unrelated to the present analyses, were completed in one of the laboratory rooms prior to the measure of social distance/closeness.

Toward the end of the laboratory session, participants were instructed to wait in a waiting room while the experimenter retrieved their payment for participation. The waiting room contained five chairs. On the left-most chair, a briefcase, notebook, and pen (all gender neutral) were intentionally placed to suggest the presence of another person. When opening the door of the waiting room, the experimenter, blind to the hypothesis, said: "Oh, someone must already be waiting in here. Well, you can wait in here too. Go ahead and take a seat, and I'll be back in just a moment." After coming back, the experimenter noted discretely in which of the four available chairs the participant had chosen to sit.

The measure of behavioral social distance corresponded to the distance, in number of chairs, between the chair with the belongings and the chair on which the participant decided to sit, with the score ranging from 1 (closest) to 4 (farthest). Surprisingly, 46 participants were still standing when the experimenter returned, possibly because they assumed that he or she would return shortly. These participants did not differ on religiosity from the participants who chose to sit ($p = 0.60$) and were not included in the analyses. For the remaining participants, 0.4% chose chair 1, 40.2% chair 2, 33.1% chair 3, and 7.1% chair 4.

A week later, participants responded to a simple 1-item measure of religiosity: "God is important in my life" (e.g., Van Cappellen, Saroglou, & Toth-Gauthier, 2016). Participants rated the extent to which this statement was true on a 7-point scale (0 = *not at all*; 7 = *completely*). Eight participants did not respond to this item. The mean score for the scale was 3.97, with a standard deviation of 2.70.

*2.2. Results and discussion*

The final sample for analyses was composed of 186 participants. As hypothesized, the importance of God in one's life was significantly and negatively correlated with the measure of behavioral social distance, $r = -0.17$, $p = 0.022$ (two-tailed), 95% CI [$-0.03$ to $-0.31$]. Participants who rated God as more important sat closer to the occupied chair (fewer chairs between theirs and the occupied one). These results suggest that religious individuals tend to create conditions for the initiation of a social interaction with an unknown target whose identity was not specified.

## 3. Study 2

Results from Study 1 suggest that religiosity is weakly related to the motive to affiliate as demonstrated by sitting closer to an occupied chair. The first aim of Study 2 was to conceptually replicate Study 1, using a different measure of affiliation, the *Pictorial Attitude Implicit Association Test for Need for Affiliation* (Slabbinck et al., 2012). This measure was developed to optimize the properties of the IAT by including (1) pictorial target stimuli, which are more likely than words to arouse implicit motives and reduce the likelihood of priming concepts that are irrelevant and (2) affective attribute categories. This task has convergent,

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[1] In all studies, participants had the option of selecting Protestant or Catholic but were then combined under the category Christian. Some participants selected the response "other" and then specified a Protestant denomination. These responses were recoded as Christians. In Study 2, participants' religious affiliation was asked twice using the same question, once during registration and once at the end of the lab session. We combined the information of the two questions to minimize missing data. One participant selected "other" twice and specified "don't care" and "none". This participant was recoded as agnostic. However, keeping this participant in "other," and therefore not including him/her in the second set of analyses (intergroup) does not change the pattern of results.

[2] In Study 1, there was no significant difference between oxytocin or placebo on behavioral social distance (respectively, $M = 2.6$, $SD = 0.66$; $M = 2.6$, $SD = 0.66$; $F(1, 192) = 0.39$, $p = 0.531$, $\eta_p^2 = 0.002$). There was no significant difference between mindfulness or loving-kindness meditation on behavioral social distance (respectively, $M = 2.6$, $SD = 0.63$; $M = 2.6$, $SD = 0.67$; $F(1, 192) = 0.03$, $p = 0.860$, $\eta_p^2 = 0.00$). Finally, the interaction between the two sets of conditions on behavioral social distance was not significant ($F(3, 189) = 1.21$, $p = 0.274$, $\eta_p^2 = 0.006$).

discriminant, and incremental validity over other popular techniques to assess implicit motives such as the Picture Story Exercises (Schultheiss & Pang, 2007; Slabbinck et al., 2012).

The second aim of Study 2 was to examine whether religiosity predicts social affiliation differently for in-group and outgroup targets. Religiosity should be positively associated with social affiliation when the target is neutral or part of the in-group, but it is unclear whether religiosity is negatively related or merely unrelated to affiliation when the target is a member of a (non)religious out-group. The present studies were conducted in the United States (U.S.) where Christians are the majority religious group. Therefore, we chose atheists as the target out-group in Studies 2 and 3. In a study conducted in the U.S. by Edgell, Gerteis, and Hartmann (2006), atheists represented the least accepted group. For a religious person, atheists would therefore hinder the potential pleasant outcomes of an interaction. Atheists thus constitute the group of choice to test the possibility that the relationship between religion and social affiliation is moderated by the identity of the affiliation target.

To examine this question, we used the same waiting room task as in Study 1 except we manipulated the identity of the person supposedly sitting on the occupied chair to be either a Christian or an atheist. Following recommendations for the study of intergroup bias (Hewstone et al., 2002), we looked separately at the components of in-group favoritism and out-group derogation by including independent assessments of in-group and out-group.

### 3.1. Method

#### 3.1.1. Participants

Participants were college students at the same university ($N = 154$; 59.7% women, 22.7% men, 17.5% did not report their gender; $M_{Age} = 19$, $SD_{Age} = 1.2$). In exchange for course credit, they participated in a study purportedly investigating attention processes. The study was approved by the relevant Institutional Review Board. The majority of participants self-identified as White/Caucasian (57.1%), and the remaining participants were Asian (12.3%), Black/African American (11.7%), American Indian (1.3%), or Hawaiian (0.6%); 9.1% identified as Hispanic. Participants were Christian (66.3%), Buddhist (1.3%), Jewish (4.5%), Agnostic (15.6%), Atheist (9.1%), or other (3.2%)[1].

#### 3.1.2. Procedure

Participants sat in a cubicle and completed the *Pictorial Attitude Implicit Association Test for Need for Affiliation* (PA-IAT, Slabbinck et al., 2012).[3] Participants categorized six pictures depicting affiliation situations (e.g., children walking hand in hand on beach) and six pictures depicting non-affiliation situations (e.g., businessman standing at meeting table without others depicted) according to the labels "Together" or "Alone." In addition, they classified six positively valenced (e.g., nice) and six negatively valenced words (e.g., nasty) according to the labels "Attractive" or "Not attractive." The IAT consisted of seven blocks of trials (See Slabbinck et al., 2012, for a full description). Data from all combined blocks were used to compute the PA-IAT score (D1 measure, see Greenwald, Nosek, & Banaji, 2003). Latencies below 300 ms and above 1000 ms were discarded. Scores were calculated such that a high PA-IAT score represents a strong implicit need for affiliation. Due to time constraints and technical issues at the beginning of the study, the PA-IAT was collected for only 127 participants. One outlier ($-4$ SD from the mean) was removed from analyses, as well as 11 participants who made >10% errors in categorizing the pictures and words with the correct label (Slabbinck et al., 2012); scores ranged from $-0.38$ to 0.97, $M = 0.39$, $SD = 0.29$.

Participants were then led to a waiting room ostensibly to give the experimenter time to set up the next task. As in Study 1, the waiting room contained five chairs; a briefcase, notebook, and a pen were placed on the leftmost chair to suggest the presence of another person.

Participants were randomly assigned to one of two conditions that varied whether the chair was "occupied" by a Christian or an atheist participant. The experimenter told the participant on their way to the waiting room: "We actually share the waiting room with another research assistant… [For **Christian condition**:] who is conducting a study on the Psychology of Christianity with only Christian participants. It is an interesting study". [For **atheist condition**:] "who is conducting a study on the Psychology of Atheism with only Atheist participants. It is an interesting study." Then, when opening the door of the waiting room the experimenter said: "Oh, it looks like their participant is already here and will be back. But it is fine for you to wait here. Just have a seat, and I'll be back shortly." When the experimenter came back to the waiting room, he or she discretely noted where the participant was sitting. Data from two participants were accidentally not recorded. Out of the 152 participants for whom data was collected, 21.1% chose to sit on chair 1, 49.3% on chair 2, 19.7% on chair 3, and 9.9% on chair 4. The researcher then led the participants back to the cubicle where they answered questions regarding their religious beliefs.

Religiosity was measured with two items (Saroglou & Munoz-Garcia, 2008) assessing the importance of God in one's life and the importance of religion in one's life (1 = *not at all*; 7 = *completely*). These two items were averaged ($r = 0.85$). Six participants chose to not respond to those items or had missing data. Mean score for the scale was 4.4 ($SD = 2.2$).

### 3.2. Results and discussion

The first set of analyses included all participants and tested the relation between religiosity and the PA-IAT, which measures general implicit need for social affiliation. For these analyses, the final sample size accounting for missing values and percentage of errors criteria was $n = 110$. As hypothesized, a linear regression analysis revealed that religiosity was a significant predictor of implicit need for social affiliation, $R^2 = 0.04$, $\beta = 0.20$, $B = 0.03$, $SE\ B = 0.01$, 95% CI for $B$ [0.002 to 0.05], $t(109) = 2.2$, $p = 0.033$. These results support the hypothesis that social affiliation motives, using an implicit measure, increases as a function of religiosity and align with the behavioral findings of Study 1. In the absence of any identifying information regarding the affiliation target, religiosity was related to more positive attitudes toward affiliation.

The second set of analyses focused on the behavioral social distance measure to examine whether religiosity predicts affiliation even when the affiliation target is explicitly identified as an atheist. We did not include atheist participants, who represented only a minority in this study, as well as the small percentage of participants explicitly affiliating with another religion than Christianity (including those who selected "other," for whom greater scores on religiosity would mean greater affiliation to a religious group that is not Christian, the in-group tested here). The resulting sample size for these analyses taking into account missing data for the other variables was $n = 120$. Tests for the two-way interaction between target condition (Christian or atheist; dummy coded 1 and 2 respectively) and religiosity (mean centered) were conducted using the PROCESS macro for SPSS (model 1) with 5000 bootstrapped samples (Hayes, 2013). Results revealed no main effect of target condition on which chair was chosen ($B = 0.01$, $SE\ B = 0.15$, 95% CI [$-0.29$ to 0.31], $t(116) = 0.4$, *ns*). However, a significant main effect of religiosity ($B = -0.37$, $SE\ B = 0.12$, 95% CI [$-0.60$ to $-0.14$], $t(116) = -3.2$, $p = 0.002$) showed that greater religiosity was associated with sitting closer to the target, independent of the target's identity, which replicates Study 1.[4]

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[3] Participants engaged in a preliminary task that had no effect on their responses.

[4] Following the suggestion of a reviewer, we tested whether implicit motives for social affiliation (assessed by the PA-IAT) mediated the relation between religiosity and the chair chosen (independently of whether the chair was "occupied" by a Christian or an atheist. Given that the samples were different for each set of analyses, we tested the model using the large sample used for the PA-IAT analyses, including all participants. Mediation tests using Model 4 of the Process macro (Hayes, 2013) revealed no significant mediation. Indirect effect point estimate = 0.003, SE = 0.009, 95% Bias Corrected CI [$-0.01$, 0.02].

Furthermore, as hypothesized, a significant interaction emerged between target condition and religiosity ($B = 0.21$, $SE\ B = 0.07$, 95% CI [0.07 to 0.35], $t(116) = 2.9$, $p = 0.004$). Further analyses revealed that when the target was ostensibly Christian, religiosity predicted sitting closer to the occupied chair ($B = -0.16$, $SE\ B = 0.05$, 95% CI [$-0.26$ to $-0.06$], $t(58) = -3.09$, $p = 0.003$). In contrast, when the target was ostensibly atheist, religiosity was unrelated to which chair was chosen ($B = 0.05$, $SE\ B = 0.05$, 95% CI [$-0.05$ to $0.15$]), $t(58) = 1.00$, ns). These results reveal that the effect of religiosity on social affiliation does not extend to members of value-threatening out-groups such as atheists. Furthermore, this evidence suggests that religious participants demonstrate in-group preference without out-group derogation; that is, religiosity was not related to sitting farther away when the target was an atheist. However, the results of Study 2 are limited by the non-inclusion in the research design of a neutral target control condition.

## 4. Study 3

Studies 1 and 2 showed that religiosity is positively related to social affiliation when the religious identity of the target is not specified or is known to be an in-group member. The goal of Study 3 was to replicate and extend the intergroup findings of Study 2. First, we used a different behavioral measure of social affiliation/exclusion that enabled the investigation of biases toward different targets within a single task instead of randomizing participants between different conditions. Addressing a critical limitation of Study 2, Study 3 also included a neutral target in addition to an in-group and out-group target.

Participants played a virtual ball tossing game with three other co-players of different religious identities (i.e., Christian, atheist, or unidentified/neutral). The addition of a neutral target made it possible to investigate in-group favoritism (favoring the Christian over the atheist and the neutral) and out-group derogation (disfavoring the atheist over the Christian and the neutral) separately. A slightly different version of this Cyberball game has been the focus of numerous studies on the psychological and physical effects of social exclusion (e.g., Eisenberger, Lieberman, & Williams, 2003; Hartgerink, van Beest, Wicherts, & Williams, 2015). This research shows that being excluded during the game evokes a sense of rejection and strong emotional reactions.

In addition to measuring general religiosity, Study 3 also included a measure of religious fundamentalism, the belief that one's faith is true and should be defended against evil forces that attack it (Altemeyer & Hunsberger, 2004). For religious fundamentalists, affiliating with atheists represent an even less enjoyable experience than for religious people more generally. We therefore hypothesized that religious fundamentalism may be related to both in-group favoritism as well as out-group derogation. Fundamentalist individuals may also perceive members of groups dissimilar in values as more threatening, which may prompt greater out-group derogation (Riek et al., 2006).

### 4.1. Method

#### 4.1.1. Participants

Data were pooled from three separate studies[5]: Study 1 ($n = 84$; December 2013), Study 2 ($n = 82$; January 2014), and Study 3 ($n = 187$; June 2014). Participants were workers on Amazon Mechanical Turk ($n = 353$; 57.8% women, 40.2% men, 2% did not report their gender; $M_{Age} = 37.0$, $SD_{Age} = 13.8$). Location was restricted to the United States. In exchange for $0.70, they participated in a study described as investigating attention. The majority of participants identified their race as White/Caucasian (82.7%), and the remaining participants were Asian (5.4%), Black/African American (7.9%), American Indian (0.6%), or

Hawaiian (0.6%); 9.1% identified their ethnicity as Hispanic. A total of 2.8% did not report their race and 2% did not report their ethnicity. Participants were Christian (45.6%), Muslim (0.8%), Buddhist (2%), Jewish (1.7%), Agnostic (19.3%), Atheist (19.5%), or other (9.6%)[1], with 1.4% not reporting their religious affiliation.

#### 4.1.2. Procedure

The three studies from which the data were pooled were each conducted online. Participants were asked to play an online ball tossing game (Cyberball 4.0, Williams, Yeager, Cheung, & Choi, 2012). We adapted the Cyberball game to serve as a measure of intergroup affiliation/exclusion in a similar fashion as Degner, Wentura, Gniewosz, and Noack (2007). Similarly to past studies using Cyberball games, participants were told that playing this online ball tossing game was a good way to practice their mental visualization skills. They were requested to mentally visualize the entire experience and create in their mind a complete picture of what might be going on if they were playing this game in real life. Participants were led to believe that they would be playing with three other players.

Participants received the following written instructions: "In a few moments, you will be playing the ball tossing game with other participants from a large study on walking groups directed by a researcher with whom we collaborate. You will be paired with participants from different walking groups (e.g., Forests and Lake walking group; Go Green walking group; The Atheists walking group; the Causeway Christian walking group; Pet Lovers walking group) or with participants who do not participate in a walking group. Their group will be displayed but do not pay attention to their identity as it is not related to the present study."

In reality, the three players were controlled by the computer. The identities of the players were manipulated to include an atheist (from "the Atheist walking group"), a Christian (from "the Causeway Christian walking group"), and a neutral player (no religion specified, "no walking group"). The three fictitious players threw the ball randomly to one of the three other players, including the participant. Each time a participant threw the ball to another player, the identity of that player was recorded. The game lasted for 30 throws, and all participants threw the ball at least seven times. We analyzed the participant's first six throws (scores ranging from 0 to 6 for each of the three targets) to give the possibility to observe fair behavior (i.e., throwing the ball twice to each target). These numbers yield three intergroup bias scores: (1) in-group/out-group difference, (2) in-group favoritism (in-group vs. neutral), and (3) out-group derogation (out-group vs. neutral). Despite the explicit request to ignore the other players' identity, we assessed participants' knowledge of it right after the game. Only participants who provided the correct answers were included in the analyses ($n = 294$).

Finally, participants completed measures of their religious beliefs. First, they completed three items (Saroglou & Munoz-Garcia, 2008) assessing the importance of God and the importance of religion in their life (7-point scale, $1 = $ *not at all*, $7 = $ *completely*), and frequency of prayer ($7 = $ *More than once a day*, $6 = $ *Once a day*, $5 = $ *A few times a week*, $4 = $ *Once a week*, $3 = $ *A few times a month*, $2 = $ *Once a month*, $1 = $ *Less than once a month*, $0 = $ *Never*). Scores were standardized and then averaged. Five participants did not respond. Reliability was good ($\alpha = 0.90$). Participants also completed the *Revised 12-Item Religious Fundamentalism Scale* (Altemeyer & Hunsberger, 2004) using a 9-point scale ($1 = $ *very strongly disagree*, $9 = $ *very strongly agree*). Example items include: "The fundamentals of God's religion should never be tampered with, or compromised with others' beliefs;" "To lead the best, most meaningful life, one must belong to the one, fundamentally true religion." Reliability was satisfactory ($\alpha = 0.84$). Seven participants did not respond. Mean score for the scale was 3.66 ($SD = 2.33$).

### 4.2. Results and discussion

As in Study 2, we excluded atheist participants as well as participants explicitly identifying with a religion other than Christianity

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[5] Each study investigated additional questions related to the link between religion and conformity that are not the target of the present manuscript. These data are still under analysis and may be part of a future publication. In each study, participants engaged in a preliminary task that had no effect on their responses.

(including those who selected the response option "other"). The sample size for the analyses was $n = 193$. To test whether religiosity is related to intergroup bias, we conducted linear regression analyses of religiosity on each of the three bias scores: in-group/out-group difference, in-group favoritism (in-group vs. neutral), and out-group derogation (out-group vs. neutral). Results revealed that religiosity predicted in-group/out-group difference ($R^2 = 0.07$, $B = 0.53$, $SE = 0.14$, 95% CI of $B$ [0.26, 0.80], $t(191) = 3.9$, $p < 0.001$) and in-group favoritism ($R^2 = 0.05$, $B = 0.37$, $SE = 0.12$, 95% CI of $B$ [0.16, 0.63], $t(191) = 3.3$, $p = 0.001$). However, religiosity did not predict out-group derogation ($R^2 = 0.01$, $B = 0.13$, $SE = 0.12$, 95% CI for $B$ [−0.11, 0.38], $t(191) = 1.1$, *ns*).

We then ran the same tests using religious fundamentalism as the predictor. As with general religiosity, religious fundamentalism predicted in-group/out-group difference ($R^2 = 0.10$, $B = 0.23$, $SE = 0.05$, 95% CI of $B$ [0.13, 0.33], $t(190) = 4.6$, $p < 0.001$) and in-group favoritism ($R^2 = 0.03$, $B = 0.10$, $SE = 0.05$, 95% CI of $B$ [0.02, 0.19], $t(190) = 2.3$, $p = 0.023$). In addition, religious fundamentalism also predicted out-group derogation ($R^2 = 0.04$, $B = 0.12$, $SE = 0.05$, 95% CI of $B$ [0.04, 0.21], $t(190) = 2.8$, $p = 0.006$).

## 5. General discussion

Although universal, the motivation for social affiliation varies between individuals and across contexts. These studies add to the literature by investigating the role of religiosity in the motivation for social affiliation. With only 16% of the world population not affiliated to a religion in 2010 according to a Pew survey (Pew Research Center, 2012), religiosity is an important factor to consider in the study of interpersonal behavior.

Converging lines of research suggest that social affiliation is a core feature of religion. Not only may religion be a response to the need for affiliation, but religion as a whole (including beliefs, norms, rituals, and community) enables and amplifies social connectedness and affiliation. For example, people who are religious have larger social networks than those who are less religious (Strawbridge et al., 2001). However, little is known about the link between religiosity and affiliation motivation at the individual level.

Studies 1 and 2 investigated the subtle ways in which implicit affiliation motivation operates as a function of religiosity. Using both a behavioral measures of social closeness (i.e., sitting closer to an ostensibly occupied chair in a waiting room; Holland et al., 2004) and an implicit measure of social affiliation based on reaction-times (i.e., adapted *Implicit Association Test*, Slabbinck et al., 2012), results revealed that religiosity was related to behaviors that promote social affiliation and to more positive implicit attitudes toward affiliation.

Importantly, the present theorizing and empirical tests are consistent with an approach-oriented motivation for affiliation (Boyatzis, 1973; Schultheiss, 2008) in which people seek opportunities to affiliate out of a desire for positive experiences rather than because of an interpersonal deficit or to cope with social exclusion or vulnerability (e.g., Aydin et al., 2010). These findings are consistent with the fact that religious people not only report more frequent experiences of affiliation (Idler, 1987) but also report higher quality social relationships (Ellison & George, 1994).

Another possible explanation for the present results, particularly the finding that religiosity is associated with sitting closer to an occupied chair, is that religious individuals have more frequent opportunities for closeness with others in religious contexts, and that their interpersonal habits and mindsets spill over into their everyday behavior. Religious people may also be more collectivistic (Cukur, De Guzman, & Carlo, 2004), and members of collectivistic cultures sit closer together than members of individualistic cultures (e.g., Cline & Puhl, 1984; Remland, Jones, & Brinkman, 1995; Watson, 1970). Finally, religious people may tend to possess personality characteristics that are more aligned with social affiliation motives. A meta-analysis found that

religiosity is positively correlated with agreeableness and extraversion, though it was also weakly negatively correlated with openness to experience (Saroglou, 2010).

All of these explanations rest on the interpretation that religiosity promotes social affiliation, but given the cross-sectional nature of the three studies, an alternative interpretation is that individuals with greater affiliation motivation are more likely to become religious. Along these lines, administering oxytocin, a polypeptide implicated in social bonding, increased spirituality in a male sample (Van Cappellen, Way, Isgett, & Fredrickson, 2016). Future research may test whether oxytocin may be related to religious experiences per se. Interestingly, just like religion, oxytocin also appears to foster *limited* social affiliation, not always extending to outgroup members and modulated by competitive or threatening contexts (Van Ijzendoorn & Bakermans-Kranenburg, 2012). Another interpretation is that religiosity and affiliation motivation mutually reinforce each other. Longitudinal and/or experimental research could shed light on these questions of directionality. Future research should also assess which facet(s) of religiosity (e.g., beliefs, practice) are conducive of social affiliation. Possibly, all of the facets contribute to social affiliation and reinforce each other (Saroglou, 2014). The short measures of general religiosity used here, although widely used, do not allow for a nuanced investigation of this specific question.

In Studies 1 and 2, the identity of the targets of affiliation was unknown, a prototype of the stranger one might meet in everyday interactions (e.g., a new colleague or a person sitting on the same bus). Therefore, the findings from Studies 1 and 2 suggest that religiosity's relationship to social affiliation points to a general disposition that extends beyond attachment to in-group members.

However, Studies 2 and 3 showed that there are limits to this general motive for social affiliation by varying the identity of the target of affiliation to be a religious or nonreligious person. The motivation for affiliation presupposes that positive outcomes might be obtained through affiliating. We reasoned that the motivation for affiliation should vary as a function of what the target of affiliation can offer; higher affiliation motivation when the target is like-minded and lower when the target holds threatening values. Accordingly, Study 2 found that religiosity was related to sitting closer to an occupied chair only when the chair was not occupied by a threatening out-group member (i.e., an atheist). Study 3 extended these findings by using an adapted Cyberball game in which participants played simultaneously with a Christian, an atheist, and a neutral player. The results showed that religiosity and religious fundamentalism predicted greater bias. Highly religious participants favored their own group compared to any out-group (in-group favoritism) but did not display out-group derogation. However, participants who scored high in religious fundamentalism clearly disfavored value-threatening out-group members (out-group derogation), possibly because people who score high on religious fundamentalism perceive greater threat to their beliefs, which is one predictor of out-group derogation (Riek et al., 2006).

In closing, religiosity represents an important individual difference in the degree to which people are motivated to affiliate with others. Across two studies, greater religiosity was related to implicit and behavioral measures of general social affiliation. This general tendency may explain why religions seem to overcome natural and cultural barriers (e.g., geography, socioeconomic status, language related) to unify people around a common set of beliefs, practices, and values. It has also important potential implications for the believers, as the size and quality of religious people' social networks may partly explain why religious people tend to have better physical and mental health (Hayward & Krause, 2014). There might also be indirect benefits for religious organizations to promote social affiliation as shared beliefs and values are reinforced through collective gatherings (Páez et al., 2015; Rossano, 2012; Van Cappellen & Rimé, 2014). People with greater affiliation motivation are also more sensitive to social demands (Hill, 2009) and more likely to comply with requests (Walker & Heyns, 1962). The present results

may partly explain why religion appears to support conformity (Van Cappellen, Corneille, Cols, & Saroglou, 2011) and submission to authority figures (Saroglou et al., 2009). However, the general tendency for religious people to be higher in affiliation motivation is moderated by the characteristics of the target and may disappear when the affiliation target is explicitly identified as a member of a value-threatening outgroup. Unsurprisingly, despite their generally affiliative nature, religious people are not motivated to affiliate with those who disagree with fundamental aspects of their religion.

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