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IN DEFENSE OF RELIGION: SHARED REALITY MODERATES THE UNCONSCIOUS THREAT OF EVOLUTION

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This research demonstrates that stability and change in self-described religiosity is regulated by the particular interpersonal relationships in which religious beliefs are shared, along lines implied by shared reality theory (e.g., Hardin & Conley, 2001). In Experiment 1, exposure to evolution-related words reduced the religiosity and anti-atheist prejudice of participants who perceived their religious experience to be unshared with their fathers, but not of participants who perceived their religious experience to be shared with their fathers. In Experiment 2, exposure to evolution-related words reduced the religiosity and anti-atheist prejudice of insecurely attached participants but not securely attached participants. Together results suggest that dynamics in religiosity and religion-related prejudice are regulated by the two key elements postulated in shared reality theory: relationship quality and the degree to which relationship-relevant experiences are perceived to be shared.

" . . . our personal relation to God is dependent upon our relation to our physical father, fluctuating and changing with him . . . "

—Freud (1913)

America has long been mired in a highly publicized culture war over evolution (Getz, 2006; Miller, Scott, & Okamoto, 2006). Few, if any, scientific theories have been singled out for political debate over their merits or pedagogical suitability to the degree that the theory of evolution has. Objections to evolution are not limited to an angry few. Two in three American adults dismiss either evolutionary theory as false or are uncertain of its authenticity, ranking America 33rd out of 34 countries in public acceptance of evolution (Miller et al., 2006). Remarkably, that num-

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ber may be growing. It has been 150 years since the publication of *On the Origin of Species* (Darwin, 1859) and not only has the theory of evolution been consistently supported empirically (e.g., Mayr, 2001), it is recognized as the unifying paradigm across the biological sciences (Dawkins, 2006; Miller et al., 2006; NSTA, 2003).

So why do so many Americans object to evolution? Although the answer is undoubtedly complex and multiply determined, we have focused in this research on the possibility that people object to evolution to the extent that evolution represents a challenge to important interpersonal relationships, a central implication of shared reality theory (Hardin & Conley, 2001; Hardin & Higgins, 1996). In the U.S., the theory of evolution is commonly perceived to be incompatible with religious beliefs about the role of God and the place of humanity in creation—beliefs often shared within important interpersonal relationships, including the family. As such, many presume or have been told that evolution is suspect by the most important people in their lives—fathers, mothers, spouses, friends, and religious leaders. Given evidence that those who oppose evolutionary theory almost always do so for religious reasons (e.g., Dawkins, 2006; Persons, 1956; Scott, 2004), and that religious beliefs are almost always established and cultivated within the family (Freud, 1921, 1933; Sullivan, 1953), the nexus of religiosity, beliefs about evolution, and interpersonal relationships is a promising place to explore how shared-reality processes may regulate threats to religious experience posed by evolution.

According to shared reality theory, experiences and attitudes are cognitively realized when they are perceived to be acknowledged, recognized, or otherwise intersubjectively "shared" with others. This social-cognitive process establishes and regulates both the particular interpersonal relationships involved in the shared experience and the particular experiences shared in the relationships. In other words, people fulfill both the need to belong and the need to know through the interpersonal regulation of shared reality (Hardin & Higgins, 1996). Applying this analysis to the case of religion, individual religiosity is established and maintained as a consequence of shared religious experience with others. The particular relationships in which religious experience is shared are the relationships in which religion is based, and threats to religious experience, in turn, threaten those relationships in which religious experience is shared. When those relationships are highly stable, people may defend the religious shared reality that in part binds the relationships (e.g., Asch, 1952; Hardin & Higgins, 1996; Sherif, 1936). And research suggests that religious beliefs are most often established and cultivated within the family with one's parents (Beit-Hallahmi & Argyle, 1997; Caplovitz & Sherrow, 1977; Cavalli-Sforza, Feldman, Chen, & Dornbusch, 1982).

Evidence in support of shared reality theory has been captured in experiments that demonstrate the role of shared reality in the objectification of experience in communication and memory (e.g., Echterhoff, Higgins, Kopietz, & Groll, 2008) as well as in experiments on social tuning, in which people regulate their attitudes according to the ostensible attitudes of others in ways that reflect interpersonal dynamics (e.g., Sinclair, Lowery, Hardin & Colangelo, 2005). For example, shared reality emerges tacitly in the mundane communicative context of the social psychology experiment, and does so as a function of relationship quality. Automatic anti-Black prejudice among Whites is lower in the presence of a Black experimenter than a White experimenter (Lowery, Hardin, & Sinclair, 2001), an effect that is both moderated and mediated by relationship quality (Sinclair, Lowery et al., 2005). Although automatic prejudice is tuned toward the ostensible attitudes of

a liked experimenter, automatic prejudice is anti-tuned away from the ostensible attitudes of a disliked experimenter (Sinclair, Lowery et al., 2005). Similar social tuning effects have also been observed for attitudes regarding gender and ethnic self-stereotyping (e.g., Sinclair, Hardin, & Lowery, 2006) and political ideology (Jost, Ledgerwood, & Hardin, 2008). In a finding demonstrating the importance of shared reality at the representational level of analysis, "saying-is-believing" effects indicated by biased memory occur to the extent that one's speech is perceived to be shared with the audience (Echterhoff et al., 2008; see also Higgins & Rholes, 1978).

Shared reality theory has implications that are relevant to the epidemic of anti-evolution attitudes in the U.S. Paramount among these is the postulate that attitudes are psychologically defended to the degree to which they are shared in stable, vital relationships (Hardin & Higgins, 1996). According to shared reality theory, beliefs perceived to be shared within close relationships are significant to the unity and well-being of that relationship (Hardin & Conley, 2001; Hardin & Higgins, 1996; see also Asch, 1952; Heider, 1958; Sherif, 1936). Shared reality theory implies that a challenge to a belief is not only a challenge to the belief itself but also a challenge to the relationships on which the belief is founded, with the implication that beliefs shared in stable relationships should be especially resistant to change. Evidence for this postulate includes findings that gender and ethnic self-stereotyping occur only to the degree that participants believe that the people who know them best agree that stereotypes are applicable to them (Sinclair, Hardin, & Lowery, 2006) as well as experiments demonstrating that the defense of self-concepts through self-verification occurs only on self-concepts perceived to be shared with significant others (Hardin & Higgins, 1996; cf. Swann, 1990). Evidence also includes demonstrations that increased anti-gay prejudice in the presence of an ostensibly gay versus straight experimenter is eliminated and perhaps even reversed among those with gay friends (Cheung et al., 2010).

To the extent that threats to religious faith also threaten the relationships in which the faith is shared, psychological responses to the threat should also be different for those who perceive their religious experience to be shared than unshared with significant others. Religious experience shared in stable relationships should be defended, and religious experience unshared in stable relationships should be malleable. Indeed, evidence that parental relationships animate religious experience has been shown in two experiments that explored how threats to religiosity were defended as a function of parental attachment. Birgegard & Granqvist (2004) found that subliminal threats related to separation from God ("God has forsaken me") and mother ("mother is gone") decreased religiosity among participants insecurely attached to their parents but increased religiosity among participants securely attached to their parents. Given theoretical and empirical reasons to locate the stability of religious experience in the family, we explored the threat that evolution may pose in the context of family religiosity and attitudes toward those presumed to be antagonistic to religion.

THE PRESENT RESEARCH

Despite over a century of attention in psychology, there is very little experimental research on the personal religious experience, much less how it relates to atti-

tudes toward evolution. Indeed, to our knowledge, just one published experiment has investigated the relationship between religiosity and evolution, and it shows that increasing evolution salience decreases belief in creationism among creationists (Schimel, Hayes, Williams, & Jahrig, 2007, Study 5). Due to the personal nature of religious beliefs in the U.S. as well as the common distrust of scientific methods and motives among many religious believers (Dawkins, 2006; Nisbet, & Mooney, 2007; Persons, 1956), we explored the interpersonal foundations of the evolution-religion relationship in a paradigm that has proven both unobtrusive and immune to simple self-presentational biases: a subliminal-priming procedure in which thoughts are experimentally manipulated outside the conscious awareness of participants. In the two experiments reported here, participants completed questionnaires about the religious experience of themselves and their parents after subliminal exposure to words either related or unrelated to evolution.

Of particular interest to us were effects on religiosity implicating the role of interpersonal dynamics. Shared reality theory implies that to the degree that evolution represents a threat to religiosity, even unconscious thoughts of evolution should reduce religious commitment among those whose religious experience is perceived to be unshared with their parents or to the degree that their parental relationships are vulnerable. By the same token, shared reality theory implies that religious experience shared in strong parental relationships should not be easily shaken because reduced religious commitment would, in turn, threaten those parental relationships.

This hypothesis was explored in two experiments, which investigated the interpersonal regulation of religious experience in several complementary ways. In Experiment 1, the effect of evolution on religiosity was examined as a function of the degree to which participants perceived their religious experience to be shared with their parents. In Experiment 2, the effect of evolution on religiosity was examined as a function of the strength of parental relationships as assessed by adult attachment style. Both experiments explored the shared-reality implication that threats to religious experience should also affect anti-atheist prejudice, because atheists are commonly assumed to be antagonistic to religion. Finally, Experiment 1 afforded a test of the implication of psychodynamic theory that religious experience might be especially bound up with relationships with fathers, the parent normatively representative of conceptions of God in Judeo-Christian traditions (e.g., Freud, 1921; Ullman, 1982).

EXPERIMENT 1

METHOD

Participants and Design

In exchange for partial course credit, 225 Brooklyn College undergraduates (154 women, 71 men) completed questionnaires concerning their religious experience and relationships after subliminal exposure to words either related or unrelated to evolution in a 2 (Evolution: related, unrelated) x 2 (Participant Religion: Christian, Jew) x 2 (Participant Gender: female, male) x 2 (Religious Shared Reality: shared, unshared) between-subjects mixed factorial. Participants indicated their religious identification in response to the question, "What religious affiliation do

you currently identify with most?" Freely generated religious self-identification frequencies were: 86 Christian (38.2%), 70 Jewish (31.1%), 22 Atheist/Agnostic/Non-believer (9.8%), 14 Muslim (6.2%), 10 did not provide an answer (4.4%), 10 belief unspecified (4.4%), 7 Buddhist (3.1%), 4 provided multiple answers (i.e., more than one religion; 2.1%), and 2 Hindu (.9%). It is noteworthy that students at Brooklyn College are unusually religious by the standards of public American collegiate institutions. For example, among participants in our analyzed sample, the mean level of agreement with the statement, "I am a religious person" was 4.71 and the average level of agreement with the statement, "Religion is important to my everyday life" was 4.41 (where 1 = "strongly disagree" and 6 = "strongly agree"). We focus on the two largest religious groups in our sample, Christian and Jewish participants (114 women, 42 men).

Procedure and Materials

Each participant completed the entire experiment on individual computers in a single session, including a "perceptual judgment task" in which the evolution priming manipulation occurred, questionnaires about the religious experience of the self and close others, and a concluding demographic questionnaire.

The cognitive salience of evolution was manipulated by subliminally exposing participants to words either related or unrelated to evolution (see Table 1)[1] in a task adapted from Devine (1989; see also Conley, Rabinowitz, & Hardin, in press; Gross & Hardin, 2007). For each trial of the task participants indicated whether a stimulus flash—presented randomly in one of the four quadrants of the screen—appeared to the left or to the right of a central focal point (*) by pressing "as quickly and accurately as possible" the key labeled LEFT or RIGHT, respectively. Participants were accurately advised that the best strategy was to focus on the orientation symbol in the center of the screen. To facilitate attentiveness, the presentation duration of the orientation symbol (*) was varied randomly (250 ms, 500 ms, 750 ms, 1000 ms, or 1250 ms). Incorrect judgments elicited a chord sound accompanied by a red X in the center of the screen. No response within two seconds of the stimulus presentation elicited a bell sound and a "no response detected" message in the center of the screen.

Each stimulus flash comprised (a) a forward mask string of 10 Xs (the length of the longest stimulus word) presented for 100 ms, (b) a prime word presented for 84 ms, and (c) a backward mask of 10 Xs for 200 ms. E-Prime version 1.0 (Schneider, Eschman, & Zuccolotto, 2002) was used to administer the study and to collect the data on five PC computers (running Win2K). The computer monitor refresh rate was 75 Hz. To assess participant awareness of the subliminal primes, participants

1. The evolution-related words were the ten most frequent associations an independent sample of 30 participants had to the concept of evolution. Each evolution-unrelated word matched the first two or three letters and approximate number of total letters of its corresponding evolution word. Another independent sample of 20 participants using scales from 0 ("not at all") to 6 ("completely") judged words to be more representative of the concept evolution if they were evolution-related ($M = 6.56$) than evolution-unrelated ($M = 3.34$), $t(19) = 11.69$, $p < .001$, but equivalently positive ($M = 3.77$, $M = 3.49$, respectively, $t(19) = .85$, $p = .85$) and negative ($M = 3.05$, $M = 3.0$, respectively, $t(19) = .19$, $p = .40$). Words were judged to be more representative of mortality if they were evolution-related ($M = 4.24$) than evolution-unrelated ($M = 2.99$), $t(19) = 5.12$, $p < .001$.

TABLE 1. Stimulus Words Used in the Perceptual Judgment Tasks in Experiments 1 and 2

Evolution-Related Primes		Evolution-Unrelated Primes	
Evolution	Extinction	Equation	Exaggeration
Darwin	Science	Dolphin	Skeptical
Adaptation	Genetics	Adeptness	General
Selection	Mutation	Salubrious	Mutual
Species	Fossil	Spectacle	Floss

were asked if they had seen anything other than Xs in the stimulus flicker immediately following the perceptual judgment task. Among the 156 participants in the analyzed sample, just two correctly reported one word each. Ninety percent of the remaining participants stated "no," and 10% reported such vagaries as: "I thought I saw words or letters, but I'm not sure."

After the priming task, participants completed 74 statements concerning their religious and political attitudes as well as perceptions of the religious and political attitudes of their parents, from which the focal measures were created, including assessments of self-religiosity, anti-atheist prejudice, evolution-threat, and religious shared reality. Additionally, participants completed a 16-item collective self-esteem scale modified for religion (Luhtanen & Crocker, 1992) and a brief demographic questionnaire. For all measures, participants responded with their level of agreement to each statement using a 6-point scale (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree). The statements were presented one at a time in the same order to all participants and were automatically advanced following each response. The experiment concluded following the completion of a demographic questionnaire in which participants freely typed in their gender and religious affiliation. The average time to complete the experiment was 25 minutes.

Self-Religiosity. The 22-item self-religiosity scale was constructed from the items that best represented personal religious experience such as "I am a religious person," "For me, life without religion would be meaningless," and "Religion is important in my day-to-day life." (See Appendix A for all items in the scale; Cronbach's alpha = .95).

Shared Reality. Responses to statements regarding each parent—for example, "My father shares with me the same beliefs about religion and spirituality"—were used to categorize participants according to religious shared reality. Participants who responded with agreement (4, 5, or 6, i.e., somewhat agree, agree, and strongly agree, respectively) were categorized as perceiving their religious experience as "shared" with the parent, and participants who responded with disagreement (a 1, 2, or 3, i.e., somewhat disagree, disagree, and strongly disagree, respectively) were categorized as perceiving their religious experience as "unshared" with the parent.[2] Participants also responded to the statement, "I share the same religious beliefs as my parents." Congruent with previous research indicating that religion has

2. Neither the mother nor father shared reality statement was affected by the evolution priming manipulation (both *ps* > .91).

its roots in the family, of the 156 participants in our analyzed sample 121 (77.5%) agreed to some degree with this statement. Only 5 (3.2%) strongly disagreed with the statement.

Anti-Atheist Prejudice. To explore participant evaluations of people assumed to have antagonistic attitudes toward religion, a 5-item scale was created to assess anti-atheist prejudice: "I could never fully trust an atheist"; "I find the word atheist offensive"; "I feel uncomfortable around atheists"; "I do not think that an atheist should be allowed to be president"; and "I would never vote for a presidential candidate who was an atheist" (Cronbach's alpha = .85).

Evolution Threat. To examine whether participants in our sample indeed find evolution threatening to their religion, a 4-item scale was created to assess evolution threat: "Knowledge of evolution has caused me to doubt my religion" (reverse scored); "There is conflict between my religion and the scientific theory of evolution"; "I have been told by a leader of my religious community that evolution is wrong"; and "I don't believe in evolution because it contradicts my religious beliefs" (Cronbach's alpha = .62).

Collective Self-Esteem. We adapted to religion the Collective Self-Esteem Scale (CSE; Luhtanen & Crocker, 1992), which measures attitudes toward one's group identity. The CSE comprises four 4-item subscales: the "membership" subscale measures the sense of being a worthy member of the group (e.g., "I am a cooperative participant of the religious group to which I belong"); the "private" subscale measures private attitudes toward the group (e.g., "In general, I'm glad to be a member of the religious group I belong to"); the "public" subscale measures perceptions of attitudes of others toward the group (e.g., "In general, others respect the religious group that I am a member of"); and the "identity" subscale measures the centrality of the group to the self-concept (e.g., "The religious group I am a part of is an important reflection of who I am"). Participants responded to the 16 items of the CSE on 6-point (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = somewhat agree, 5 = agree, 6 = strongly agree)[3] scales. The CSE subscales had Cronbach alphas of .83, .83, .70, and .82 for the Membership, Private, Public, and Identity subscales, respectively, and .88 for the entire scale.

RESULTS

Unconscious thoughts about evolution affected self-religiosity along the lines implied by shared reality, as indicated by analyses in which self-religiosity scores were submitted to 2 (Evolution Prime: related, unrelated) x 2 (Participant Religion: Christian, Jew) x 2 (Participant Gender: female, male) x 2 (Religious Shared Reality: shared, unshared) mixed Analyses of Variance (ANOVAs).

As shown in Figure 1, subliminal exposure to evolution-related words decreased self-religiosity among participants whose religious beliefs were perceived to be un-

3. The usual 7-point scales were modified to 6-point scales to be consistent with the other measures used.

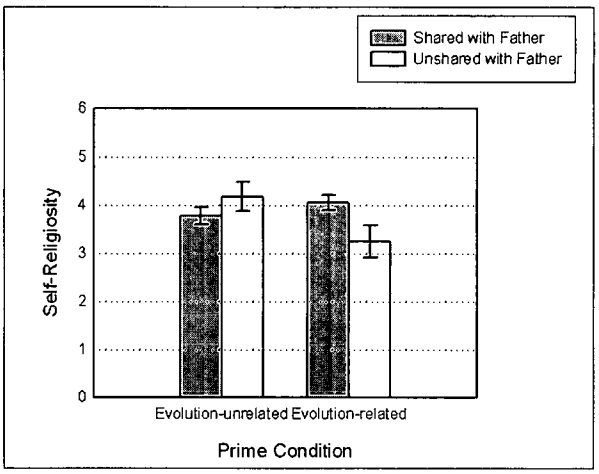

FIGURE 1. (Experiment 1) Estimated marginal means (+SE) for self-religiosity as a function of shared reality and the evolutionary prime.

shared with their fathers but not among participants whose religious beliefs were perceived to be shared with their fathers, as indicated by a significant Evolution Prime x Shared Reality interaction, $F(1, 112) = 5.53$, $p = 0.02$, $\eta_p^2 = 0.05$.[4] Participants who perceived their religious experience to be unshared with their fathers exhibited significantly less self-religiosity after exposure to evolution-related words ($M = 3.25$, $SE = .33$) than evolution-unrelated words ($M = 4.18$, SE .31), $t(35) = 2.02$, $p = .05$, but participants who perceived their religious experience to be shared with their fathers exhibited, if anything, greater self-religiosity after exposure to evolution-related words ($M = 4.07$, $SE = 0.16$) than evolution-unrelated words ($M = 3.77$, $SE = 0.18$), although this difference was not significant, $t(89) = 1.14$, $p = 0.26$. In short, the unconscious threat to religion posed by evolution words in reducing the self-religiosity of some was successfully defended among those who perceived their religious experience to be shared with their fathers. No other significant effects were observed in this analysis.

Interestingly, although religious shared reality with fathers moderated the effect of subliminal exposure to evolution-related words on self-religiosity, religious shared reality with mothers did not, as indicated by a nonsignificant Prime x Shared Reality interaction, $F(1, 113) = .16$, $p = 0.90$, $\eta_p^2 = 0.00$.[5] However, participants exhibited greater self-religiosity if they perceived religious shared reality

4. Because the self-religiosity scale comprises items that may reflect individual and interdependent concerns, we explored the possibility that the effect of shared reality might have been carried more by the interdependent items. It wasn't. The "interdependent" items were significantly correlated with the "individual" items ($r = .75$, $p < .000$), and the two subscales behaved identically as a function of evolution and shared reality.

5. The 2 (Evolution Prime: related, unrelated) x 2 (Shared reality with father: shared, unshared) x 2 (Shared reality with mother: shared, unshared) ANOVA 3-way interaction was not significant, $F(1, 120) = 2.177$, $p = .14$, $\eta_p^2 = 0.02$. This is likely due to the fact that the ANOVA 3-way fits a model in which shared reality with father increases self-religiosity as a function of the evolutionary primes whereas shared reality with mother decreases self-religiosity as a function of the evolutionary primes (see Abelson, 1995; Rosenthal & Rosnow, 1985; Rosnow & Rosenthal, 1995). Hence, the ANOVA 3-way interaction model fits neither the predictions nor the observed results.

with their mothers than if they did not, as indicated by a main effect of shared reality with mother, $F(1, 113) = 4.42$, $p = 0.04$, $\eta_p^2 = 0.04$.

A similar relationship between perceived religious shared reality with fathers and self-religiosity was observed on the private CSE subscale, which reflects personal evaluation of one's religion. Subliminal exposure to evolution-related words decreased private religious self-regard for those who perceived their religious experience to be unshared with their fathers but not for those who perceived their religious experience to be shared with their father, as indicated by a significant Prime x Shared Reality interaction, $F(1, 112) = 6.40$, $p = .01$, $\eta_p^2 = .05$. Participants who perceived their religious experience to be unshared with their fathers indicated significantly lower levels of positive religious self-regard after subliminal exposure to evolution-related words ($M = 4.23$, $SE = 0.26$) than evolution-unrelated words ($M = 5.12$, $SE = 0.25$), $t(35) = 2.44$, $p = .02$, but participants who perceived their religious experience to be shared with their fathers indicated, if anything, somewhat higher levels of positive religious self-regard after subliminal exposure to evolution-related words ($M = 5.20$, $SE = 0.13$) than evolution-unrelated words ($M = 5.07$, $SE = 0.25$), although the difference was not significant, $t(89) = 0.67$, $p = 0.50$.

Also replicating findings on self-religiosity, shared reality with mothers did not moderate the priming effect on private CSE, as indicated by a nonsignificant Prime x Shared Reality interaction, $F(1, 113) = .22$, $p = .64$, $\eta_p^2 = .002$. In addition, lower private CSE was found following subliminal exposure to the evolutionary prime, as indicated by a marginally significant main effect of the evolutionary prime, $F(1, 112) = 3.43$, $p = .07$, $\eta_p^2 = .03$, and among participants who perceived unshared versus shared religious experience with their fathers, as indicated by a significant Shared Reality main effect, $F(1, 112) = 5.24$, $p = .024$, $\eta_p^2 = .045$. Women ($M = 5.17$, $SE = 0.09$) reported greater private CSE than did men ($M = 4.64$, $SE = 0.18$), as indicated by a significant main effect of Gender, $F(1, 112) = 6.96$, $p = .01$, $\eta_p^2 = .059$.

Although no other effects were found on the remaining CSE subscales, analysis of the complete Collective Self-Esteem Scale indicated that the Christian participants ($M = 3.39$, $SE = .04$) reported significantly greater feelings of identification with their religious group than did the Jewish participants ($M = 3.28$, $SE = .04$), as indicated by a significant main effect of religion, $F(1, 112) = 3.98$, $p = .048$, $\eta_p^2 = .034$.

Congruent with the shared reality theory implication that attitudes reflect strands of social influence that can compete in the web of interpersonal relationships, complementary effects of the evolution manipulation were observed on anti-atheist prejudice. As shown in Figure 2, subliminal exposure to evolution-related words decreased anti-atheist prejudice, but only among participants who perceived their religious experience to be unshared with their fathers, as indicated by a marginally significant Prime x Shared Reality interaction, $F(1, 112) = 3.09$, $p = 0.08$, $\eta_p^2 = 0.03$. Among participants who perceived their religious experience to be unshared with their fathers, anti-atheist prejudice was significantly lower after exposure to evolution-related words ($M = 1.83$, $SE = .38$) than evolution-unrelated words ($M = 2.94$, $SE = .36$), $t(35) = 2.10$, $p = .04$. In contrast, among participants who perceived their religious experience to be shared with their fathers, exposure to evolution-related words did not reduce anti-atheist prejudice, $t(89) = 0.27$, $p = .78$. Here again, the buffer that shared reality with fathers provided did not apply to shared reality with mothers, as indicated by a nonsignificant Prime x Shared

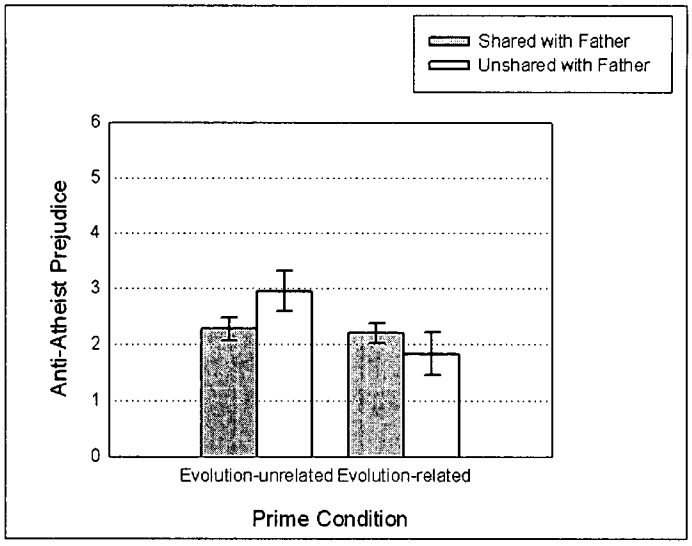

FIGURE 2. (Experiment 1) Estimated marginal means (+SE) for anti-atheist prejudice as a function of shared reality and the evolutionary prime (higher numbers = greater negative attitudes).

Reality with mother interaction, $F(1, 113) = 0.028$, $p = .87$, $\eta_p^2 = .00$. In addition, exposure to evolution-related words independently reduced levels of anti-atheist prejudice, as indicated by a significant main effect of the evolutionary prime, $F(1, 112) = 4.03$, $p = .05$, $\eta_p^2 = .04$.[6]

Finally, as shown in Table 2, correlations among the focal measures provide converging evidence for their validity. Most importantly, self-religiosity was significantly correlated with anti-atheist prejudice as well as all the CSE subscales of group identity except the "public" subscale. Moreover, indicating that evolution indeed threatens religious experience, evolution threat was positively predicted by measures of self-religiosity, the three subscales of the CSE, and anti-atheist prejudice.

DISCUSSION

Results of Experiment 1 suggest that unconscious thoughts of evolution are psychologically threatening to religious belief, at least among the Christian and Jewish participants in our sample, and congruent with shared reality theory results suggest that this threat is defended only to the extent that religious beliefs are perceived to be shared with fathers. Subliminal exposure to evolution-related words reduced self-religiosity, private attitudes toward religion, and anti-atheist prejudice unless participants believed that their religious experience was shared with their fathers.

6. For clarity and to parallel the ANOVA analysis in Experiment 2, the shared reality variables were dichotomized and ANOVA was used in Experiment 1 rather than regression which produced identical results.

TABLE 2. Correlations among Measures in Study 1 (N = 156)

	Anti-Atheist Prejudice	CSE† Complete	CSE Membership	CSE Private	CSE Public	CSE Identity	Evolution Threat
Self-Religiosity	.610**	.066	.683**	.535**	.107	.783**	.565**
Anti-Atheist Prejudice ‡		.057	.401**	.299**	-.034	.531**	.409**
CSE Complete			-.107	-.208*	.435**	-.001	.144
CSE Membership				.645**	.141	.678**	.417**
CSE Private					.243**	.596**	.227**
CSE Public						.103	-.016
CSE Identity							.488**

Note. *$p < .001$, **$p < .000$; †MCSE = Collective Self-Esteem Scale modified for religion and its subscales; ‡for the anti-atheist prejudice scale, higher numbers indicate greater negative attitudes.

Notably, it was shared reality with fathers but not shared reality with mothers that moderated the effect of the evolution prime. Perceived religious shared reality with mothers predicted greater self-religiosity, but it did not buffer the unconscious threat posed by evolution. Although this finding is implicated by classical psychodynamic theory as well as shared reality theory if religiosity is indeed normatively tethered more tightly to relationships with fathers than mothers, the issue certainly deserves further research. Importantly, however, we do know that it is not attributable to restricted range of perceived religious shared reality with mothers, which was comparable to the range of perceived religious shared reality with fathers.

EXPERIMENT 2

Shared reality theory implies that not only should religious beliefs be defended to the extent that they are perceived to be shared with fathers as observed in Experiment 1, but also by the quality of filial relationships. Hence, to provide complementary evidence of the importance of parental relationships in the modulation of religious experience, Experiment 2 replicated Experiment 1 but focused on adult attachment style, which is rooted in the subjective quality of parental relationships (Bowlby, 1969).

In an attempt to explain the emotional connections forged in parental relationships, Bowlby (1969) postulated the existence of an attachment system, evolved through natural selection to regulate proximity between infants and their primary caregivers, and thereby facilitate survival from predators and other natural dangers. During infancy and childhood repeated interactions with the primary attachment figure aggregate in cognition to create a set of expectancies regarding how their psychological needs will be satisfied, and thereby how to maintain "felt security" (Sroufe & Waters, 1977). This set of cognitive expectancies, which is understood to be an "internal working model" of self and others, depends on the nature of the experiences shared with the attachment figure in which individuals come to see themselves as relatively loved or unloved and parents as relatively trustworthy or untrustworthy. Hence, individual differences in attachment style, which are commonly characterized as either optimally "secure" or suboptimally "insecure" (e.g., Ainsworth, Blehar, Waters, & Wall, 1978), are ideally suited to reflect the quality of parental relationships.

Congruent with the attachment theory postulate that attachment-related expectancies are influential from "the cradle to the grave" (Bowlby, 1979, p. 129), research over the past 20 years has successfully applied attachment theory to the understanding of adult relationships (e.g., Hazan & Shaver, 1987), including to adult religious behavior (Kirkpatrick, 1999, 2005; Kirkpatrick & Shaver, 1990, 1992). If attachment style reflects the quality of the relationship one has with one's parents (e.g., Hazan & Shaver, 1987; Shaver, Hazan, & Bradshaw, 1988), then shared reality theory implies that threats to one's religious beliefs should be defended to the degree that one is securely attached because religious experience is known to be established within the family for most people (Freud, 1921, 1933; Sullivan, 1953). Hence, in Experiment 2 we tested this hypothesis by examining effects of unconscious thoughts of evolution on self-religiosity and anti-atheist prejudice as a function of adult attachment style.

METHOD

Participants and Design

In exchange for partial course credit, 130 Brooklyn College undergraduates (77 women, 47 men) completed questionnaires concerning the religious experience of themselves and their parents after subliminal exposure to words either related or unrelated to evolution. The method and procedure were identical to Experiment 1, except for the focus on adult attachment style. The self-reported religious frequencies were: 61 Christian (46.9%), 33 Jewish (25.4%), 13 Atheist/Agnostic/Nonbeliever (10%), 10 Muslim (7.7%), 6 Belief in God—no affiliation (4.6%), 3 Buddhist (2.3%), 4 other (3.1%). As in Experiment 1, the analyses reported here focus on responses from the two largest religious groups from the sample, Christian and Jewish participants (60 women, 34 men).

All participants performed a perceptual judgment task to manipulate thoughts of evolution identical to the task in Experiment 1 except that the presentation duration for the prime words in Experiment 2 was reduced one computer screen refresh cycle from 84 ms to 67 ms (see Gross & Hardin, 2007). None of the participants correctly identified any of the words subliminally presented to them during the perceptual judgment task, nor did they indicate any suspicion that the task influenced their subsequent responses.

To assess adult attachment style, participants completed Hazan and Shaver's (1987) three-part measure in which participants choose one of three attachment-style prototypes that best applies to them. The three choices were:

> "I find it relatively easy to get close to others and I am comfortable depending on them. I don't often worry about being abandoned or about someone getting too close to me." ("Secure" attachment style);
> "I am somewhat uncomfortable being close to others. I find it difficult to trust them completely, difficult to allow myself to depend on them. I am nervous when anyone gets too close, and often, love partners want me to be more intimate than I feel comfortable being." ("Avoidant" attachment style);
> "I find that others are reluctant to get as close as I would like. I often worry that my partner doesn't really love me or won't want to stay with me. I want to get very close to my partner, and the desire sometimes scares people away." ("Anxious/ambivalent" attachment style).

Participants who reported avoidant or anxious/ambivalent attachment styles were consolidated into a single *insecure* category for our analysis. The 22-item self-religiosity scale and the evolution-threat scale used in Experiment 1 were used in Experiment 2 (Cronbach's alphas were .96 and .53 respectively).

Because shared reality theory implies that relationship strength should buffer only relationship-relevant beliefs perceived to be shared, it is important to note that the vast majority of participants believed that their religious experience was broadly shared with their parents, at a rate replicating that found in Experiment 1. In response to the statement, "I share the same religious beliefs as my parents," 75 of 94 participants (79.8%) agreed to some degree. Only 4 participants (4.3%) strongly disagreed with the statement.

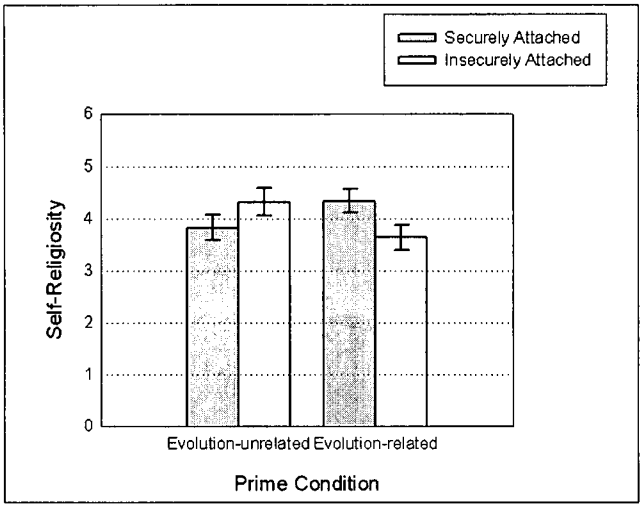

FIGURE 3. (Experiment 2) Estimated marginal means (+SE) for self-religiosity as a function of adult attachment style and the evolutionary prime.

RESULTS

Adult attachment style moderated the effect of subliminal exposure to evolution-related words on religious experience in a way that complements findings of Experiment 1. Self-religiosity was subjected to a 2 (Evolution Prime: related, unrelated) x 2 (Participant Religion: Christian, Jew) x 2 (Participant Gender: female, male) x 2 (Attachment Style: secure, insecure) between-subjects mixed factorial ANOVA. As shown in Figure 3, participants who reported an insecure attachment style were less able to defend against threats to their religiosity than participants who reported a secure attachment style, as indicated by a significant Evolution Prime x Attachment Style interaction, $F(1, 75) = 5.95$, $p = .02$, $\eta_p^2 = .07$.[7] Insecurely attached participants exhibited lower levels of self-religiosity after subliminal exposure to evolution-related words ($M = 3.63$, $SE = 0.24$) than evolution-unrelated words ($M = 4.31$, $SE = 0.26$), $t(46) = 1.95$, $p = .05$, but securely attached participants exhibited, if anything, higher levels of self-religiosity after subliminal exposure to evolution-related words ($M = 4.33$, $SE = 0.23$) than evolution-unrelated words ($M = 3.82$, $SE = 0.24$), although the difference was not significant, $t(42) = 1.47$, $p = .15$.

In addition, insecurely attached participants were less able to defend against the threats to religious identity on the membership subscale of the CSE, as indicated by a significant Prime x Attachment Style interaction, $F(1, 78) = 4.60$, $p = .03$, $\eta_p^2 = .06$. Insecurely attached participants exhibited lower levels of membership CSE after subliminal exposure to evolution-related words ($M = 3.64$, $SE = 0.27$) than evolution-unrelated words ($M = 4.42$, $SE = 0.30$), $t(46) = 1.86$, $p = .06$, but securely attached participants exhibited, if anything, higher levels of membership CSE

7. Replicating Experiment 1, the effect of shared reality was not carried by the "interdependent" religiosity items. The interdependent items were significantly correlated with the individual items ($r = .78$, $p < .000$), and the two subscales behaved identically as a function of both the primes and the shared reality moderation.

after subliminal exposure to evolution-related words (M = 4.59, SE = 0.26) than evolution-unrelated words (M = 4.19, SE = .026), although the difference was not significant, $t(44) = 1.03$, $p = .31$.

Replicating results from Experiment 1 suggesting that religiosity is expressed in the context of multiple interpersonal relationships, subliminal exposure to evolution-related words affected anti-atheist prejudice, but did so differently depending upon attachment style. Insecurely attached participants exhibited reduced anti-atheist prejudice after exposure to evolution-related words, but securely attached participants exhibited increased anti-atheist prejudice after exposure to evolution-related words, although the Prime x Attachment Style interaction was only marginally significant, $F(1, 89) = 2.36$, $p = 0.13$, $\eta_p^2 = 0.03$.

Finally, also replicating Experiment 1, Table 3 shows that the relationships among the focal variables were coherent.

DISCUSSION

Results of Experiment 2 complement the results of Experiment 1 by providing converging evidence that the concept of evolution is psychologically threatening for religious believers and that this threat is defended to the extent that religious beliefs are tethered to parental relationships characterized by consistency in nurturance, love, trust, and support. When subliminally exposed to evolution-related words, participants who reported insecure attachment exhibited lower levels of self-religiosity whereas participants who reported secure attachment exhibited, if anything, greater levels of self-religiosity. These findings support the shared reality theory implication that relationship strength is a critical moderator of shared reality effects (e.g., Hardin & Conley, 2001).

Although several other multi-item self-report scales of individual adult attachment style are commonly used (Brennan, Clark, & Shaver, 1998; Fraley & Waller, 1998) we used Hazan and Shaver's (1987) typological measure because it has proved useful in previous research related to religiosity (e.g., Granqvist, 1998; Kirkpatrick & Shaver, 1990, 1992; Mikulincer, Florian, & Tolmacz, 1990). Like any measure, it has strengths and weaknesses. Although its categorical structure makes it easy to use, its psychometric properties make it less sensitive to individual differences than more recent instruments (e.g., Brennan et al., 1998), a property that makes the measure a conservative test of the role of attachment in responses to threats to religious experience.

Although results involving self-religiosity and anti-atheist prejudice were coherent whether moderated by religious shared reality (Experiment 1) or parental attachment (Experiment 2), results involving collective self-esteem were inconsistent. Shared reality with fathers moderated effects of evolution on the private subscale of the CSE in Experiment 1, but attachment moderated effects of evolution on the membership subscale of the CSE in Experiment 2. Although, both subscales were significantly correlated with each other in both experiments they didn't behave identically as a function of the evolutionary prime across the two experiments. The reasons for the discrepancy are unclear. Clarifying the interrelations among various aspects of self-esteem, religious identity, and religiosity in the context of relationship-specific shared reality and relationship-specific quality should be a priority in future research.

TABLE 3. Correlations among Measures in Study 2 (*ns* ranged from 87 to 94)

	Anti-Atheist Prejudice	CSE† Complete	CSE Membership	CSE Private	CSE Public	CSE Identity	Evolution Threat
Self-Religiosity	.669**	.741**	.598**	.526**	.342*	.748**	.429**
Anti-Atheist Prejudice ‡		.614**	.538**	.486**	.190	.667**	.303*
CSE Complete			.849**	.765**	.659**	.848**	.158
CSE Membership				.571**	.432**	.630**	.166
CSE Private					.342*	.573**	.068
CSE Public						.349*	.000
CSE Identity							.225*

Note. *$p < .001$, **$p < .000$; †MCSE = Collective Self-Esteem Scale modified for religion and its subscales; ‡for the anti-atheist prejudice scale, higher numbers indicate greater negative attitudes.

In sum, results of Experiment 2 complement results of Experiment 1 by demonstrating that relationship quality in the context of religious shared reality contributes to buffering threats to religious experience—a finding broadly consistent with research demonstrating that shared attitudes are predicted by relationship strength (Sinclair, Dunn, & Lowery, 2005).

GENERAL DISCUSSION

Results of the two experiments reported here not only demonstrate that religious experience is bound up with parental relationships, but also show that the role of parental attachment in regulating religiosity may be explained by the mechanism postulated by shared reality theory. In Experiment 2, the unconscious threat posed by the concept of evolution was defended as a function of attachment security, providing a conceptual replication of Birgegard and Granqvist (2004) who unconsciously threatened the religious experience of their participants with the subliminal phrase "God has forsaken me." In Experiment 1, the unconscious threat posed by the concept of evolution was defended as a function of perceived religious shared reality with father, providing preliminary evidence that effects of parental attachment may involve religious shared reality. Shared reality theory integrates both of these findings by providing a formal model that includes both the role of shared reality and relationship engagement (Hardin & Conley, 2001). Moreover, findings suggest that the dynamics of personal religious experience are bound up in a web of interpersonal connections, as indicated by the finding that anti-atheist prejudice was reduced by exposure to evolution-related thoughts unless participants perceived their religious experience to be shared with their fathers (Experiment 1) or perceived themselves to be securely attached to their parents (Experiment 2). Hence, results suggest that the dynamics of personal religious experience may qualitatively differ as a function of two key elements of shared reality theory, the degree to which the belief is perceived to be shared as well as the degree to which the relationships in which the beliefs are shared are vital.

The implications of these findings are both practical and theoretical. Most importantly, results suggest that more than knowledge is at stake when beliefs are challenged—even by mere subliminal exposure to a religion-threatening concept. Results suggest that understanding stability and change in religious beliefs requires a broader consideration of social and interpersonal factors, including the intricate web of social relationships tethered to religious beliefs through shared reality or lack thereof. It is one thing to cast doubt on religious beliefs; it is quite another thing to cast doubt even implicitly on important relationships.

The discovery that religious shared reality with fathers but not mothers qualitatively moderates responses to the threat posed by evolution raises fascinating questions. One possible reason is that Judeo-Christian religiosity is commonly and normatively tethered to relationships with religious patriarchs, including fathers and religious leaders as well as heroes of religious liturgy (cf. Bloom, 1992). Although religiosity may tend to be patriarchal—at least normatively—within some groups, shared reality theory implies that for individuals who identify their religious experience as particularly relevant to relationships with their mothers, shared reality with mothers should operate in the same way. Further research is necessary to test this possibility. However, evidence already exists that subconscious anxiety

about the maternal relationship can indeed regulate religiosity among believers: subliminal exposure to the phrase "mother is gone" reduced religiosity among the insecurely attached but increased religiosity among the securely attached (Birgegard & Granqvist, 2004, Exp. 2). This finding is especially noteworthy from a shared reality perspective because it shows that a threat to a specific relationship threatens the religious shared reality linked to that relationship.

This research suggests promising directions for research on religious attitudes generally as well as research relating attachment theory and religious behavior more specifically. First, most empirical research on the relationship between attachment theory and religious behavior to date has been nonexperimental. Affirming the malleability of religious attitudes (see also Shariff, Cohen, & Norenzayan, 2008), this research demonstrates that religious experience can be studied experimentally (see also Birgegard & Granqvist, 2004). Second, results of Experiment 2 suggest a new way to understand the relationship between early childhood attachments and later adult religious behavior. Perhaps people with secure attachment histories tend to remain religious into adulthood because their religious beliefs are shared and maintained within important relationships defined by mutual trust, caring, and support—and, as shared reality theory implies, are defended accordingly. By the same token, perhaps people with insecure attachment histories are more prone to religious conversions because their religious beliefs are founded upon more precarious foundational relationships—and thereby more vulnerable to threat. This basic argument is already supported by a large and growing literature (for a review see Hardin, Cheung, Magee, Noel, & Yoshimura, in press).

Although we have framed results in terms of shared reality theory, other perspectives are worth exploring as well. For example, the evolutionary primes we used may have contextually activated an "us versus them" mentality in which religious believers perceive themselves to be in conflict with evolutionists. However, it is not clear from this perspective alone exactly why perceptions of religious shared reality or attachment with parents should moderate effects of evolution on religiosity. On the other hand, consistent with the postulate that attachment is part of a larger fear regulation system (e.g., Bowlby, 1969), research suggests that activating a secure attachment base attenuates negative reactions to outgroup targets (Mikulincer & Shaver, 2001), which in the present case would be those who believe in evolution.

Given that participants in our sample considered the evolution-related primes to be more representative of mortality than the evolution-unrelated primes, terror management theory may also be relevant (e.g., Greenberg, Pyszczynski, & Solomon, 1997). For example, thoughts of evolution increase mortality accessibility among Christians who subscribe to a creationist worldview (Schimel, Hayes, Williams, & Jahrig, 2007). Research in the terror management tradition typically shows ingroup favoritism as a function of mortality salience, yet this perspective alone does not logically imply that shared reality and attachment with parents should have the opposite effects as a function of thoughts of evolution. Even so, a promising avenue for future research will be to explore ways in which shared reality processes may interact with existential anxiety in the context of religious faith.

Although we did not find differences in the operation of self-religiosity between Christian and Jewish participants in our sample, interesting differences have been identified in research using different methods and measures of religiosity. For example, research using dimensions of intrinsic and extrinsic religiosity (Allport & Ross, 1967) suggests that Jews may place more emphasis on communal practices

(religious collectivism), whereas Protestants may place more emphasis on personal faith (religious individualism), while Catholics fall in between (Cohen & Hill, 2007; Cohen et al., 2005). Although it is possible that intrinsic religious experience should be less subject to shared-reality processes than extrinsic religious experience, shared reality theory implies that religious experience should be modulated by interpersonal dynamics through the shared-reality mechanism, whether "intrinsic" or "extrinsic"—consistent with findings across both experiments reported here.

In conclusion, the notion that threats to religious beliefs also threaten the relationships within which the religious beliefs are shared suggests a possible explanation as to why so many Americans resist evolution—even when those alternative belief systems are as subtle as an unconscious set of words related to evolution, and even for those in our sample who are not obliged through official religious doctrine to be threatened by evolution (e.g., Roman Catholic Church, 1996). From the perspective of shared reality theory, it is not surprising that the issue of teaching evolution in schools has flared into an impassioned culture war. Our findings suggest that the issue is about something more than mere ideas, including which side is more empirically or logically sound. Perhaps people who object to the theory of evolution do so because evolution threatens the very ideas that bind them to the most important people in their lives.

APPENDIX A. THE SELF-RELIGIOSITY SCALE.

(Cronbach's alpha for experiment 1 = .95; Cronbach's alpha for experiment 2 = .96)

1. During times of illness, my religious beliefs have been strengthened.
2. For me, life without religion would be meaningless.
3. I am a religious person.
4. I believe God protects me from harm.
5. I believe that death is not the end of my being.
6. I distrust people who do not share my religious beliefs.
7. I enjoy attending religious functions held by my religious group.
8. I enjoy meeting or talking often with people who share my religious beliefs.
9. I feel certain that God in some form exists.
10. I feel that there have been times when my personal desires have conflicted with rules or tenants of my religion.
11. I feel uncomfortable around people who don't share my religious beliefs.
12. I have done personal research into the history and origins of my religion.
13. I have experienced peace of mind through my prayers and meditation.
14. I pray for help during bad times.
15. I seek out people from my religious community when I need help.
16. My religion alleviates my fear death.
17. Prayer or meditation has helped me cope during times of serious illness.
18. Religion is important in my day-to-day life.
19. When I am around my friends I feel more religious or spiritual.
20. When I feel lonely, I rely on people who share my religious beliefs for support.
21. When I need suggestions on how to deal with problems, I know someone in my religious community that I can turn to.
22. When another person shares my religious or spiritual beliefs it strengthens our relationship.

REFERENCES

Abelson, R. P. (1995). *Statistics as principled argument*. Hillsdale, NJ: Erlbaum.

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ: Erlbaum.

Allport, G. W., & Ross, J. M. (1967). Personal religious orientation and prejudice. *Journal of Personality and Social Psychology, 5*, 432-445.

Asch, S. E. (1952). *Social psychology*. Englewood Cliffs, NJ: Prentice-Hall.

Beit-Hallahami, B., & Argyle, M. (1997). *The psychology of religious behavior, belief, and experience*. London: Rouledge.

Birgegard, A., & Granqvist, P. (2004). The Correspondence between attachment to parents and God: Three experiments using subliminal separation cues. *Personality and Social Psychological Bulletin, 30*, 1122.

Bloom, H. (1992). *The American religion*. New York: Simon & Schuster.

Bowlby, J. (1969). *Attachment and loss: Vol. 1. Attachment*. New York: Basic Books.

Bowlby, J. (1979). *The making and breaking of affectional bonds*. London: Tavistock.

Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult attachment. An integrative overview. In J.A. Simpson & W.S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46–76). New York: Guilford.

Caplovitz, D., & Sherrow, F. (1977). *The religious drop-outs: Apostasy among college graduates*. London: Sage.

Cavalli-Sforza, L. L., Feldman, M. W., Chen, K. H., & Dornbusch, S. N. (1982). Theory and observation in cultural transmission. *Science, 218*, 19-27.

Cheung, R. M., Fingerhut, A., Johnson, A., Noel, S., Drus, M., & Hardin, C. D. (2010). When contact increases prejudice: The web of interpersonal relationships in regulating anti-gay attitudes. Unpublished data.

Cohen, A. B., & Hill, P. C. (2007). Religion as culture: Religious individualism and collectivism among American Catholics, Jews, and Protestents. *Journal of Personality, 75*, 709-724.

Cohen, A. B., Pierce, J.D., Jr., Chambers, J., Meade, R., Gorvine, B. J., & Koenig, H. G. (2005). Intrinsic and extrinsic religiosity, belief in the afterlife, death anxiety, and life satisfaction in young Catholics and Protestants. *Joutnal of Research in Personality, 39*, 307-324.

Conley, T. D., Rabinowitz, J. L., & Hardin, C. D. (in press). O.J. Simpson as shared (and unshared) reality: The impact of consensually-shared beliefs on interpersonal perceptions and task performance in different- and same-ethnicity dyads. *Journal of Personality and Social Psychology*.

Darwin, C. (1859). *The origin of species* (Modern Library ed.) New York: Random House.

Dawkins, R. (2006). *The god delusion*. New York: Houghton Mifflin Company.

Devine, P. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*, 5-18.

Echterhoff, G., Higgins, E. T., Kopeitz, R., & Groll, S. (2008). How communication goals determine when audience tuning biases memory. *Journal of Experimental Psychology: General, 137*, 3-21.

Fraley, R. C., & Waller, N. G. (1998), Adult attachment patterns: A test of the typological model. In J.A. Simpson & W.S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 77-113). New York: Guilford.

Freud, S. (1913). *Totem and taboo*. New York: Norton.

Freud, S. (1921). *Group psychology and the analysis of the ego*. New York: Hogarth Press and the Institute of Psychoanalysis.

Freud, S. (1933). *New introductory lectures on psychoanalysis*. Translated by Walter John Herbert Sprott. New York: Norton.

Granqvist, P. (1998). Religiousness and perceived childhood attachment: On the question of compensation or correspondence. *Journal for the Scientific Study of Religion, 37*, 350-367.

Greenberg, J., Pyszczynski, T., & Solomon, S. (1997). Terror management theory of self-esteem and cultural worldviews: Empirical assessments and conceptual refinements. In P. M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 61-141). San Diego, CA: Academic.

Getz, W. M. (2006). The "theory of evolution" is a misnomer. *BioScience, 56*, 96-97.

Gross, E. F., & Hardin, C. D. (2007). Implicit and explicit stereotyping of adolescents. *Social Justice Research, 20,* 140-160.

Hardin, C. D., Cheung, R. H., Magee, M. W., Noel, S. P., & Yoshimura, K. (in press). The interpersonal functions of ideological thinking. In J. Hanson (Ed.), *Ideology and the law.* New York: Oxford University Press.

Hardin, C. D., & Conley, T. D. (2001). A relational approach to cognition: Shared experience and relationship affirmation in social cognition (pp. 3-17). In G. B. Moskowitz (Ed.), *Cognitive social psychology: The Princeton symposium on the legacy and future of social cognition.* Mahwah, NJ: Erlbaum.

Hardin, C.D., & Higgins, E. T. (1996). Shared reality: How social verification makes the subjective objective. In R. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition* (Vol. 3, pp. 28-84). New York: Guilford.

Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology, 52,* 511-524.

Heider, F. (1958). *The psychology of interpersonal relations.* New York: Wiley.

Higgins, E. T., & Rholes, W. S. (1978). "Saying is believing": Effects of message modification on memory and liking for the person described. *Journal of Experimental Social Psychology, 14,* 363-378.

Jost, J. T., Ledgerwood, A., & Hardin, C. D. (2008). Shared reality, system justification, and the relational basis of ideological opinions. *Social and Personality Psychology Compass, 2,* 171-186.

Kirkpatrick, L. A. (1999). Toward an evolutionary psychology of religion and personality. *Journal of Personality, 67,* 921-952.

Kirkpatrick, L. A. (2005). *Attachment, evolution, and the psychology of religion.* New York: Guilford.

Kirkpatrick, L. A., & Shaver, P. (1990). Attachment theory and religion: Childhood attachments, religious beliefs, and conversion. *Journal for the Scientific Study of Religion, 29,* 315-334.

Kirkpatrick, L. A., & Shaver, P. R. (1992). An attachment-theoretical approach to romantic love and religious belief. *Personality and Social Psychology Bulletin, 18*(3), 266-275.

Lowery, B. S., Hardin, C.D., & Sinclair, S. (2001). Social influence effects on automatic racial prejudice. *Journal of Personality and Social Psychology, 8,* 842-855.

Luhtanen, R., & Crocker, J. (1992). A collective self-esteem scale: Self-evaluation of one's social identity. *Personality & Social Psychology Bulletin, 18,* 302-318.

Mayr, E. (2001). *What evolution is.* New York: Basic Books.

Mikulincer, M., Florian, V., & Tolmacz, R. (1990). Attachment styles and fear of personal death: A case study of affect regulation. *Journal of Personality and Social Psychology, 58,* 273-280.

Mikulincer, M., & Shaver, P. R. (2001). Attachment theory and intergroup bias: Evidence that priming the secure base schema attenuates negative reactions to out-groups. *Journal of Personality and Social Psychology, 81,* 97-115.

Miller, J.D., Scott, E.C., & Okamoto, S. (2006). Public acceptance of evolution. *Science, 313,* 765-766.

National Science Teachers Association (NSTA). (2003). Position statement on the teaching of evolution. (Available online at: http://www.nsta.org/positionstatement&psid=10.)

Nisbet, M. C., & Mooney, C. (2007). Framing Science. *Science, 316,* 56.

Persons, S. (1956). Evolution and theology in America. In S. Persons (Ed.), *Evolutionary thought in America: How scientific theories of evolution have affected social and humanistic thought* (pp. 422-453). New York: George Braziller.

Roman Catholic Church. (1996, October 22). *Pope John Paul II's Message to Pontifical Academy of Sciences.* Retrieved December 13, 2008, from National Center for Science and Education Web site: http://ncseweb.org/media/voices/roman-catholic-church-1996.

Rosenthal, R., & Rosnow, R. L. (1985). *Contrast analysis: Focused comparisons in the analysis of variance.* New York: Cambridge University Press.

Rosnow, R. L., & Rosenthal, R. (1995). Some things you learned aren't so: Cohen's paradox, Asch's paradigm, and the interpretation of the interaction. *Psychological Science, 6,* 3-9.

Schimel, J., Hayes, J., Williams, T., & Jahrig, J. (2007). Is death really the worm at the

core? Converging evidence that worldview threat increases death-thought accessibility. *Journal of Personality and Social Psychology, 92,* 789-803.

Schneider, W., Eschman, A., & Zuccolotto, A. (2002). *E-Prime user's guide.* Pittsburgh, PA: Psychology Software Tools.

Scott, E. C. (2004). *Evolution vs. creationism: An introduction.* Santa Barbara: Greenwood Press.

Shariff, A. F., Cohen, A. B., & Norenzayan, A. (2008). The devil's advocate: Secular arguments diminish both implicit and explicit religious belief. *Journal of Cognition and Culture, 8,* 417-423.

Shaver, P. R., Hazan, C., & Bradshaw, D. (1988). Love as attachment: The integration of three behavioral systems. In R. J. Sternberg & M. L. Barnes (Eds.), *The psychology of love* (pp. 68-99). New Haven, CT: Yale University Press.

Sherif, M. (1936). *The psychology of social norms.* New York and London: Harper & Brothers Publishers.

Sinclair, S., Dunn, E., & Lowery, B. (2005). The relationship between parental racial attitudes and children's implicit prejudice. *Journal of Experimental Social Psychology, 41,* 283-289.

Sinclair, S., Hardin, C. D., & Lowery, B. (2006). Self-stereotyping in the context of multiple social identities. *Journal for Personality and Social Psychology, 4,* 529-542.

Sinclair, S., Lowery, B., Hardin, C. D., & Colangelo, A. (2005). Social tuning of automatic racial attitudes: The role of affiliative motivation. *Journal for Personality and Social Psychology, 4,* 583-592.

Sroufe, L. A., & Waters, E. (1977). Attachment as an organizational construct. *Child Development, 48,* 1184-1199.

Sullivan, H. S. (1953). *The interpersonal theory of psychiatry.* New York: Norton.

Swann, W. B. (1990). To be adored or to be known: The interplay of self-enhancement and self-verification. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook*