Christian Religious Badges Instill Trust in Christian and Non-Christian Perceivers

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We conducted 4 experiments to examine how people incorporate visual information about strangers' religious identities—*religious badges*—into their decisions about how much to trust them. Experiment 1 revealed that Christian and non-Christian participants were more trusting (as measured by self-report) of targets who wore a religious badge associated with Christianity (Ash Wednesday ashes) than toward targets who did not wear such a badge. Experiment 2 replicated Experiment 1 and also revealed that the effects of Ash Wednesday ashes on Christians' and non-Christians' trust extended to a behavioral measure of trust (i.e., monetary allocations in a multiplayer trust game). Experiment 3 replicated Experiments 1 and 2 with a different religious badge (a necklace with the Christian cross on it). Experiment 4 ruled out a potential confound. Consistent with a stereotype interpretation, these results suggest that U.S. students regard visual cues to people's espousal of Christian religious beliefs as signals of their trustworthiness.

Keywords: experimental economics, religion, religious badges, signaling

In recent years, many social scientists have noted that the world's modern religions (i.e., those that have emerged over the past several millennia) seem to have an unusually close association with prosociality (Baumard, Hyafil, Morris, & Boyer, 2015; Bloom, 2012; McCullough & Carter, 2011; Norenzayan & Shariff, 2008). Scholars have tendered various theories to explain this

relationship (e.g., Atran & Henrich, 2010; Botero et al., 2014; Bulbulia & Frean, 2010; D. D. P. Johnson, 2005; Schloss & Murray, 2011). Although these theories differ in the psychological and social mechanisms emphasized, they all posit that religious beliefs promote trust and coordinate cooperation, particularly in large groups of individuals who are not strongly related by kinship and marriage (Norenzayan, 2013) or by ethnic ties (Wright, 2009).

Here, we tested predictions about the relationship between religion and prosociality derived from signaling theory (Irons, 2001). If one accepts the premise that contemporary humans do use religion to facilitate trust, one should expect that people actively seek out information about other people's religious identities when choosing whom to trust. Particularly useful trust-relevant information might come from commitment devices (Bulbulia, 2004; Bulbulia & Sosis, 2011; Kurzban & Christner, 2011) or displays (Henrich, 2009; Wildman & Sosis, 2011) that advertise one's acceptance of the beliefs of a particular religious group while simultaneously restricting one's access to competing groups by advertising (at least tacitly) one's rejection of those competing groups' beliefs (Iannaccone, 1992; Sosis, 2003). Indeed, it is precisely because displays of religious identity simultaneously limit access to the social resources of other religious groups, or impose other sorts of costs, that credibility-enhancing religious displays should increase one's perceived trustworthiness to other members of one's own religious group (Schelling, 1960).

One group of religiously based credibility-enhancing displays have been termed religious badges (Sosis, 2006). Religious groups

often encourage or require adherents to wear specific types of clothing or adornments, or to make certain modifications to their bodies (e.g., scarification, painting, or piercing), that advertise their religious affiliations. Some Muslims and Buddhists, for example, develop *zabiba,* or "prayer nodules," which are raised patches of tissue that develop on the forehead, knees, or feet from decades of pressing the body to the ground in daily prayer (Abanmi, Al Zouman, Al Hussaini, & Al-Asmari, 2002; ur Rehman & Asfour, 2010). Likewise, members of many Christian groups (viz., Roman Catholics, Anglicans, Lutherans, and Methodists) celebrate Ash Wednesday, which marks the beginning of Lent, by attending a service at which church leaders ceremonially inscribe palm ashes in the form of crosses onto their foreheads. Also, Muslim women's headscarves (*hijab*), the stars of David and yarmulkes that some Jews wear, and the crosses that adorn Christians' jewelry all advertise their wearers' religious identities.

Research has revealed a variety of visual cues that people often use to assess other people's trustworthiness (Bayliss & Tipper, 2006; Krumhuber et al., 2007; Rule et al., 2010; Scharlemann, Eckel, Kacelnik, & Wilson, 2001; Stirrat & Perrett, 2010; Wilson & Eckel, 2006). In the spirit of such work, here we ask the question "Do people incorporate other people's religious badges into their decision-making about whom to trust?" A large body of work in intergroup relations indicating that people (a) automatically categorize the social group memberships of other people, (b) preferentially treat members of groups to which they themselves belong, and (c) derogate members of groups to which they do not belong (Brewer, 2010; Kurzban, Tooby, & Cosmides, 2001) suggests that the answer might be "yes."

For example, in previous work, religious service attendance has predicted support for outgroup hostility and suicide terrorism in defense of one's own cultural group (Ginges, Hansen, & Norenzayan, 2009), and religious priming has increased Christian students' prejudice against African Americans and value-violating out-groups such as atheists, Muslims, and gay men (M. K. Johnson, Rowatt, & LaBouff, 2010; M. K. Johnson, Rowatt, & LaBouff, 2012). In addition, Chia and Jih (1994) found that predominantly Christian U.S. secondary school students attributed more positive personality traits (e.g., "polite;" "kind," "loving," "trustworthy") to a woman and a man wearing Christian religious garb (in the case of the woman's photo, a nun's habit and veil; in the case of the man's photo, a monk's religious robe) than did predominantly Christian students who saw photos of the same people wearing casual (i.e., nonreligious) attire. In contrast, Muslim students attributed more positive personality traits to the woman and man in casual attire than did Muslim students who observed photos of the same two people dressed in religious attire. Finally, belief in God and other indicators of religious belief appear to be positively associated with distrust and harsh moral judgments of atheists (Galen, Smith, Knapp, & Wyngarden, 2011; Gervais, Shariff, & Norenzayan, 2011).

On the other hand, different evidence suggests that observers in general—irrespectively of their own religious commitments—find religious people generally trustworthy (Putnam & Campbell, 2010). Indeed, U.S. survey data indicate that believers in God, without regard to their religious affiliation, are trusted more than are atheists (Shariff & Clark, 2013), and experimental data reveal similar findings. One explanation for this apparent tendency to attribute honesty and generosity to religious people is that it may

reflect the operation of a widespread stereotype that religious people's selfish behavior is restrained by their belief in supernatural beings that watch their behavior, pass moral judgments on it, and administer rewards and punishments in this life and hereafter (for reviews see Galen, 2012; Gervais et al., 2011; Schloss & Murray, 2011).

Overall, the pattern of results in the existing literature indicates that although religious people are often trusted more than others, when people's religious groups are explicitly identified, outgroup effects appear to emerge (i.e., ingroup members trust the targets more; outgroup members trust the targets less). These findings therefore suggest that religious badges might increase trust among fellow religionists, but reduce it among members of other religious groups.

The Present Work

In the four experiments reported herein, we tested whether observers (United States university students) use religious badges to regulate their trust toward anonymous social interaction partners. In our experiments, male and female participants viewed photographs of men either displaying or not displaying Christian religious badges. We subsequently measured participants' trust for these men via a multiitem rating scale and their generosity in an economic trust game. We also measured participants' ratings of the targets' attractiveness and submissiveness/dominance so that we could insure that any effects of the religious badges under examination here could be properly attributed to their effects on trust rather than to their effects on these two other basic dimensions of facial categorization (Stewart et al., 2012; Willis & Todorov, 2006). In keeping with the hypothesis that people use religious badges to regulate their social behavior appropriately toward ingroup and out-group members, we sought to test three predictions. First, we predicted that religious badges reduce trust (measured via rating scales and via behavior in a multiplayer trust game) among individuals with religious affiliations that are different from the religious affiliation implied by the target's badge. Second, we predicted that religious badges increase trust (measured via rating scales and via behavior in a multiplayer trust game) among individuals who share the implied religious affiliation of the badgewearer. Third, we predicted that the effects of religious badges on perceived trustworthiness and on amounts invested in the multiplayer trust game are not due to the confounding effects of religious badges on perceived attractiveness or submissiveness/dominance.

In these experiments, we focus exclusively on the religious badges of a single religious group: Christians. Although this methodological decision is not without its drawbacks (i.e., we are unable to test whether the results obtained here generalize to the badges of other religious groups), it should be kept in mind that these experiments are, as far as we are aware, the first to evaluate the effects of religious badges on both self-report and behavioral measures of trust. We examined one religion's badges in detail in hopes of being able to come to definitive conclusions about the phenomenon in one context; recent research inspired by the results reported here explored the effects of badges on trust in other religious traditions (Shaver et al., 2014).

Experiment 1

Experiment 1 tested all three predictions using a within-subjects experiment. Participants viewed 10 anonymous men's faces, two of which had been, by random assignment, electronically modified to display a specific religious badge: the ashes that many Christians receive on their foreheads as part of the annual holiday called Ash Wednesday, which marks the beginning of the season of Lent (the 40 days leading up to Easter). After viewing each face, participants rated the face for trustworthiness, attractiveness, and submissiveness/dominance.

Method

Participants. Participants were 119 introductory anthropology students at the University of Connecticut. Two participants were excluded for declining to report their religious affiliation. Of the remaining 117 participants (M_{age} = 19.89 years; SD = 1.70; range = 18–27 years) 69 participants were women. 82.1% of participants identified their ethnicity as White, 3.4% identified as Black, 3.4% as Latino, 7.7% as Asian, and 2.6% as "Other." One participant did not report his or her ethnicity. For religious affiliation, 38.5% of the sample reported being Catholic, 9.4% Protestant, 6.0% Jewish, 0.9% Hindu, and 0.9% Buddhist. 30.8% of participants reported adhering to no religion and 13.7% identified as "Other." The University of Connecticut Institutional Review Board approved all data collection procedures for the research reported here.

Measures.

Christian religious affiliation and upbringing. As noted above, participants indicated their religious affiliation using a set of fixed categories (including "Other" and "None"). Based on this information, we created a binary variable that took a value of 1 if participants indicated any Christian affiliation (i.e., "Catholic," "Protestant"), and a value of zero otherwise. Participants also indicated their primary household religious affiliation while growing up. From this information, we created a binary variable that took a value of 1 if participants indicated a Christian household religious affiliation (i.e., "Catholic," "Protestant") and a value of zero otherwise.

General religiosity. Participants completed eight self-report items (e.g., "How often have you attended religious services during the past year?"; "During the past year, how often have you experienced a feeling of religious reverence or devotion?"), which they rated on 5- or 6-point Likert-type scales. We used the mean of these eight items to measure participants' general religiosity. The internal consistency of this eight-item composite was estimated at $alpha$ = .94. High scores indicated low religiosity.

Trustworthiness. To assess participants' perceptions of each face's trustworthiness, we started with 12 items from the Propensity to Trust Scale (Glaeser, Laibson, Scheinkman, & Soutter, 2000), which we modified so that the items referred to a target person, rather than to the participant reading the item (e.g., "[I] listen to my conscience" was changed to "This person listens to his conscience"). Participants evaluated each face by indicating their agreement with each of the 12 items on a 7-point Likert-type scale (1 = *strongly disagree*; 7 = *strongly agree*).

Before conducting our main analyses, we refined the trustworthiness index via an item-total correlation analysis that enabled us to retain only the items that contributed to the overall scale's internal consistency across the 10 face stimuli. This procedure left us with seven items with which to measure participants' percep-

tions of the trustworthiness of the faces they rated (mean Cronbach's *alpha* across the 10 faces = .86). Those seven items were: "This person respects others;" "this person returns extra money when the cashier makes a mistake;" "this person is always completely fair to others;" "this person anticipates the needs of others;" "this person follows the rules;" "this person would never cheat on his taxes;" "this person listens to his conscience." We used this same seven-item measure for all four experiments reported herein.

Attractiveness and submissiveness/dominance. Participants used a 7-point Likert-type scale to rate each target's attractiveness (1 = *not at all attractive*; 7 = *very attractive*). They also used a 7-point Likert-type scale to rate each target's degree of submissiveness/dominance (1 = *very submissive*; 7 = *very dominant*). Despite the fact that single-item scales are typically inferior to multi-item scales for measuring traits because of some amount of attenuation resulting from unreliability, single-item measures of traits such as attractiveness and dominance are widely used in face perception research (Said & Todorov, 2011; Stewart et al., 2012).

Procedure. Experiment 1 was conducted before a scheduled lecture in an introductory anthropology course during the month before Easter so that it would coincide with the interval between Ash Wednesday and Easter. In class, participants received a packet of study materials. First, participants completed some self-report items to measure dispositional trust that we did not include in our analyses here. Next, participants viewed printed photographs of 10 White male faces (one per page; presented in random order). Participants were told that these photographs had been taken recently on campus. Two of the 10 photographs had the "ashes" treatment digitally applied to the forehead. Across participants, we randomly (with counterbalancing) determined which two of the 10 faces received the ashes treatment so that each of the 10 faces appeared to have ashes on the forehead for approximately 20% of participants (this procedure insured that we obtained participants' reactions to at least two faces with ashes applied to the forehead without confounding the ash treatment with participant identity). Moreover, the order in which the photographs were presented to participants was randomized. By applying the ashes treatment to only two of the 10 faces rather than, say, five of the 10, we had hoped to make the independent variable less obvious to participants in the interest of minimizing experimental demand. The items for measuring perceived trustworthiness, attractiveness, and submissiveness/dominance appeared next to each photograph, and participants were instructed not to turn the page until they had answered each question for the face on the page. After rating all 10 faces, participants completed a select set of demographic measures (including the religious measures described above). These measures were collected in all four experiments reported herein.

Face stimuli. We used 10 standardized color frontal-view photographs of White male faces with neutral expressions from the FERET database (Phillips, Moon, Rizvi, & Rauss, 2000; Phillips, Wechsler, Huang, & Rauss, 1998). We used only White male faces to reduce error variance associated with target sex and race (Scharlemann et al., 2001). Using Adobe Photoshop 9.0, we cropped the images and we set them to a standard size of 5.4" × 7.2", with a resolution of 300 pixels/in. The images were set against a white background, and the clothing was removed. For each face, we created a counterpart image that appeared to have a cross of ashes, apparently inscribed by thumb, in the middle of the person's forehead. The ashes image was generated on a piece of paper,

electronically scanned, and applied to the photographs electronically.

Analyses. Because each participant rated 10 men's faces, the data conformed to a two-level nested structure (faces nested within participants). Therefore, we used a multilevel approach to analyze the data (Bryk & Raudenbush, 2002). Multilevel approaches to data sets such as ours provide numerous advantages. For instance, they produce correct partitionings of within-subjects and between-subjects variance, yield correct standard errors, and incorporate model-based handling of missing data. Additionally, they permit treatment effects to vary across participants, and they offer intuitive approaches to modeling that variance in terms of other participant-level variables (Bryk & Raudenbush, 2002).

Using this approach, variation in the participants' 10 trust ratings (y) was partitioned into within-persons effects and between-persons effects. For the within-persons effects, we modeled the variation in the 10 trust ratings for participant j as a function of an intercept, which is the expected score on the trust measure when all other variables in the model took a score of 0, plus an "ashes" effect, which is the change in trust ratings attributable to the ashes. That is, for person j observing picture i:

$$Trust_{ij} = \beta_{0j} + \beta_{1j}(ashes_{ij}) + r_{ij} \qquad (1)$$

where β_{0j} = person j's expected trust score for faces with no ashes—also called an "intercept;" β_{1j} = the effect of ashes on participant j's picture ratings. Ashes$_{ij}$ is a dummy-coded variable that takes the value of 0 if picture i does not have ashes, and a value of 1 if it does have ashes; and r_{ij} = a residual representing the difference between person j's trust rating for picture i and the value that would be predicted on the basis of the β_{0j} and β_{1j} estimates. These residuals r_{ij} include measurement error and unmodeled substantive variation between faces (Bryk & Raudenbush, 2002).

Between-persons variation in the intercept β_{0j} and ashes effect β_{1j} is modeled as follows:

$$\beta_{0j} = \gamma_{00} + u_{0j} \qquad (2)$$

and

$$\beta_{1j} = \gamma_{10} + u_{1j} \qquad (3)$$

where γ_{00} estimates the mean trust rating across the entire sample for faces without ashes and γ_{10} estimates the average effect of ashes on trust ratings for the entire sample, respectively (hereafter called the "ashes effect"). The variables u_{0j} and u_{1j} represent person j's deviation from those population estimates. Between-persons variation in u_{0j} and u_{1j}, therefore, represent between-subjects variation in participants' average trust ratings and between-subjects variation in the effects of the ashes on their trust ratings.

We attempted to explain the between-persons variation in the effects of the ashes on participants' trust ratings on the basis of whether participants considered themselves Christian (0 = no; 1 = yes) using the binary variable described above. Including the "Christian" term to account for this variation led to a between-subjects equation of the form:

$$\beta_{1j} = \gamma_{10} + \gamma_{11}(Christian_j) + u_{1j} \qquad (4)$$

In Equation 4, the term $\gamma_{11}(Christian_j)$ indexes the differential effects of ashes on Christians' (vs. non-Christians') trust ratings of

the pictures, so it can technically be conceptualized as an "ashes by Christian" cross-level interaction. In this model, the variable "Christian" takes a value of 1 for self-identified Christians and a value of 0 otherwise, so when one evaluates the term γ_{10}, it actually represents the effects of badges on participants' trust ratings specifically for participants who did not self-identify as "Christian." By replacing the binary variable "Christian" in Equation 4 with its mirror-image ("non-Christian"), which takes values of 0 for self-identified Christians and of 1 otherwise, γ_{10} from Equation 4 becomes a parameter estimate of the mean within-subjects effect of ashes on trust ratings specifically for self-identified Christians, which we report below for illustrative purposes.

In an attempt to rule out the possibility that any links between religious badges and trust were attributable to the effects of the badges on perceived trustworthiness per se rather on potentially related traits—for example, attractiveness and submissiveness/dominance (Stirrat & Perrett, 2010; Wilson & Eckel, 2006)—we also estimated comparable models using the ratings of the targets' attractiveness and submissiveness/dominance as dependent variables. Our plan was to control those variables if they proved to be significantly influenced by the ashes treatment. We used robust estimation of standard errors for all models.

Results

Testing Prediction 1: Do religious badges (ashes) reduce trust among non-Christians? To test this prediction, we ran a hierarchical linear model that took the form of Equations 1–4. In this model (see Table 1), the mean trust rating (labeled "intercept" in Table 1) was 4.39 ($SE = 0.04$), $t(116) = 97.70$, $p < .001$. The first bar of Figure 1 (labeled "Intercept Only") depicts this effect graphically. Also, the mean within-subjects effect for ashes (the "ashes effect" in Table 1) was 0.22 ($SE = 0.09$), $t(115) = 2.37$, $p = .02$, which indicates that ashes increased trust ratings *for participants who self-identified as non-Christian* (i.e., when the "Christian" variable takes on a value of 0). Therefore, contrary to Prediction 1, the ashes did not reduce trust for non-Christian participants. In fact, they increased it. The middle bar of Figure 1 (labeled "Ashes Effect Added") depicts the effect of ashes on rated trustworthiness graphically.

In supplemental analyses (accessible at https://osf.io/a3n6w/) in which we also included a level-2 variable to indicate whether participants received predominantly Christian upbringings (0 = no; 1 = yes), the coefficient for the effect of ashes on participants' trust ratings did not change substantially in magnitude or in statistical significance (coefficient = 0.271, $p = .012$), suggesting that the self-identified non-Christians were not conditioning their trust on the basis of participants' ashes because they had come to associate ashes with ingroup membership when they were children (even though they no longer identified themselves as Christians). Likewise, the coefficient for the effect of ashes on participants' trust ratings did not change substantially in magnitude or in statistical significance (coefficient = 0.23, $p = .042$) when we included the 8-item measure of general religiosity rather than the measure of Christian upbringing as the simultaneous level-2 predictor.

Testing Prediction 2: Do religious badges (ashes) increase trust among self-identified Christians? To test this prediction, we examined the coefficient for the dummy variable representing self-identification as "Christian" versus "non-Christian." This co-

Table 1
Hierarchical Linear Models for Experiment 1

Outcome	Fixed effect	Coeff	SE	t	df	p
Trustworthiness	Intercept (γ_{00})	4.39	.04	97.70	116	<.001
	Ashes effect (γ_{10})	.22	.09	2.37	115	.02
	Ashes by Christian interaction (γ_{11})	.44	.14	3.13	115	.003
Attractiveness	Intercept (γ_{00})	3.36	.08	43.33	116	<.001
	Ashes effect (γ_{10})	−.03	.10	−.26	115	.80
	Ashes by Christian interaction (γ_{11})	.08	.14	.57	115	.57
Submissiveness/Dominance	Intercept (γ_{00})	4.41	.05	82.69	116	<.001
	Ashes effect (γ_{10})	−.11	.16	−.67	115	.50
	Ashes by Christian interaction (γ_{11})	−.10	.19	−.54	115	.59

Note. Coeff = coefficient.

efficient (labeled "ashes by Christian interaction" in Table 1) was 0.44 (SE = 0.14), $t(115) = 3.13$, $p = .003$, which indicates that ashes exerted a stronger effect on the trust ratings of the target faces for Christian participants than for non-Christian participants. The third bar of Figure 1 (labeled "Ashes × Christian Interaction Added") depicts the contribution of this effect to rated trustworthiness graphically. In a separate model in which we predicted the effect of ashes on trust with a binary variable that took values of 0 for Christians and values of 1 for non-Christians (rather than 0 for non-Christians and 1 for Christians), the mean within-subjects effect of ashes (which represents the effect of ashes specifically for self-identified Christians) was 0.67 (SE = 0.11), $t(115) = 6.09$, $p < .001$.

Thus, in support of Prediction 2, the ashes increased trust ratings for self-identified Christians—and did so more strongly than they did for non-Christians.

Testing Prediction 3: Was the effect of religious badges on perceived trustworthiness due to the confounding effects of religious badges on perceived attractiveness or submissiveness/dominance? We tested this prediction by first running hierarchical linear models that were equivalent to the models specified in Equations 1 through 4, but which used the ratings of attractiveness and submissiveness/dominance, rather than the measures of trustworthiness, as the dependent variables. We found that ashes did not significantly increase ratings of men's attractiveness ($p = .80$) or submissiveness/dominance ($p = .50$), and that these effects did not vary as a function of self-identification as Christian versus non-Christian (ps = .57 and .59, respectively). Consequently, investigating these variables further as possible confounds of the effects of ashes on trust ratings was unwarranted. Therefore, we concluded that the apparent effect of ashes on targets' perceived trustworthiness was not attributable to the confounding effects of the ashes on perceived attractiveness or submissiveness/dominance.

Discussion

Experiment 1 revealed that both Christians and non-Christians rated men who wore Ash Wednesday ashes on their foreheads as more trustworthy than men who were not wearing ashes on their foreheads. The ashes effect was stronger for Christians than for non-Christians. We also found that the effects of this particular religious badge on ratings of trust were not confounded by dominance/submissiveness or attractiveness.

Experiment 2

In Experiment 2, we used the ashes manipulation from Experiment 1 in efforts to replicate the results from Experiment 1 with both the pencil-and-paper trust ratings and participants' trusting behavior in a trust game (Berg, Dickhaut, & McCabe, 1995). We also set out to evaluate whether Christians' heightened tendency (relative to non-Christians) to rate targets wearing ashes as particularly trustworthy was caused by their enhanced ability to recognize the religious significance of the ashes.

Method

Participants. Participants were 121 introductory anthropology students at the University of Connecticut. Nine participants (7.4%) suspected that the photos had been digitally edited or had other suspicions. Three additional participants were excluded from data analysis because of missing data. The remaining sample (M_{age} = 19.38; SD = 1.45; Range = 18–28 years) included 109 (50 female) participants. 85.3% of participants identified their ethnicity as White, 3.7% identified as Black, 3.7% as Latino, and 7.3% as Asian. For
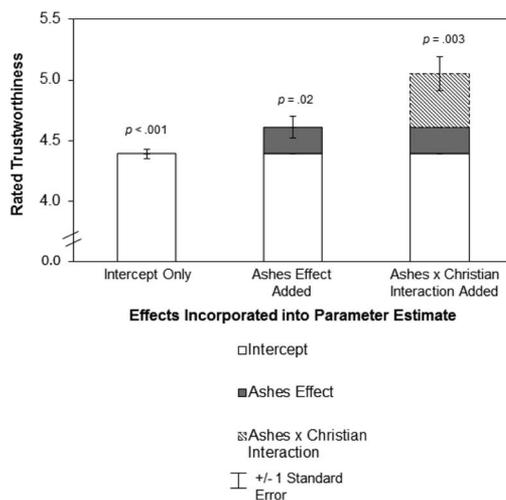

Figure 1. Contributions of the ashes effect and the Ashes × Christian interaction on rated trustworthiness (Experiment 1). Error bars = ±1 *SE*.

religious affiliation, 39.4% of the sample identified themselves as Catholic, 14.7% as Protestant, 4.6% as Jewish, 1.8% as Hindu, 0.9% as Buddhist, and 36.7% as adhering to no religion. 1.8% reported their religious affiliation as "other." Participants received a small amount of course credit, plus their earnings in the trust game, for participating.

Measures. In Experiment 2, we used the same rating measures of perceived trustworthiness (mean of seven items), attractiveness, and submissiveness/dominance as in Experiment 1 as well as the demographic measures and the 8-item measure of general religiosity as in Experiment 1. In addition, participants took part in a multiplayer version of the trust game (Berg et al., 1995). Participants were assigned to the "investor" role and were instructed that they controlled a $17 endowment from which they could allocate money (in $0.50 increments) to the men in the 10 photographs— whom we refer to here as the "trustees." Participants could commit to transferring money to all, some, or none of the trustees, as long as the sum of those transfers, plus what they retained for themselves, did not exceed $17. Participants were instructed that the experimenters would triple the transferred amounts, and that the trustees had previously made binding commitments to the percentages of the tripled investments that they would return to participants. Thus, participants' decisions about how much of the $17 to invest with each of the trustees served as a measure of how much they trusted each of the targets (Berg et al., 1995).

Procedure. As in Experiment 1, Experiment 2 was conducted in an anthropology class during the month before Easter, so that it would coincide with the interval between Ash Wednesday and Easter. In addition to the procedures from Experiment 1, as described above, participants took part in a multiplayer version of the trust game. First, participants read detailed instructions for the trust game, including a worked-out example, and saw an animated PowerPoint presentation further explaining the game. They were also invited to ask clarifying questions. The trust game occurred after participants rated each face on trustworthiness, and before they completed demographic items and the self-report religiosity items. Participants indicated their transfers to each trustee on a data sheet that included miniaturized versions of each photograph in a 2 row by 5 column array, and they were free to make changes to their allocations among the 10 individuals until they were satisfied with their vector of allocations.

This element of the experiment involved deception: The men in the photographs did not actually make decisions about what percentages to return to investors. Instead, each of their apparent responses was generated randomly. For each amount sent to a particular trustee, the percentage returned to the investor was randomly selected from a normal distribution with a mean of 100%.

After completing all of the above procedures, participants sealed their packets in an envelope. They then opened another envelope, which contained four questions about the use of ashes on two of the trustees' faces. The question most relevant to our goals here was: "Members of a particular group of people wear these marks on their forehead at a particular time of the year. Do you know what the group is?" Two raters independently evaluated participants' responses and gave them a score of either 0 ("did not recognize the religious affiliation implied by wearing ashes") or 1 ("did recognize the religious affiliation implied by wearing ashes"). The two sets of ratings were highly reliable, *kappa* =

0.93. The raters' two disagreements were resolved through discussion. Of the 109 participants, 95 (87.2%) participants successfully associated the ashes with the Christian religion. After data collection was concluded, we debriefed participants via the Internet and we paid them the following week.

Results

Testing Prediction 1: Do religious badges (ashes) reduce allocations in the trust game and trust ratings among non-Christians? First, we report the results from a hierarchical linear model of monetary allocations in the trust game. The trust game allocations were zero-inflated (nearly two thirds of participants' allocations were 0) and overdispersed (i.e., the variance of 5.24 was four times larger than the mean of 1.23). In addition, the count nature of the data (money allocated in $.50 increments) and the meaningful zero point (it is impossible to give less than $0 in the trust game), meant that the data violated the assumptions associated with continuous variable models (Atkins & Gallop, 2007). Therefore, we modeled the amounts entrusted to each target as a Poisson-distributed count variable with an overdispersion parameter. We rounded the amounts participants entrusted to each target person to the nearest dollar so the data would conform better to the assumptions of the Poisson model (Atkins & Gallop, 2007; Raudenbush & Bryk, 2002).

Participants varied in how much of the $17 they kept for themselves, so we included as a covariate the amount they kept for themselves while we were examining the effects of the ashes on the amounts they entrusted to each of the 10 men (this coefficient is labeled "Ashes by dollars kept" in Table 2). In preliminary models in which we did not include amount kept as a covariate in this fashion, the effect of ashes on participants' trust game allocations was essentially nonexistent ($p > .50$). For consistency, we included this covariate in the models of the rating-based variables below as well, and also in the models conducted for Experiments 3 and 4.

In this model, the intercept (0.24, $SE = .05$) was statistically significant, $t(108) = 4.71$, $p < .001$, meaning that the average non-Christian entrusted a nonzero amount of money to targets who scored zero on all other predictors. Exponentiating this intercept coefficient yields $1.27, which represents the estimated amount of money that non-Christian participants entrusted to targets who did not wear ashes. The first bar of Figure 2 (labeled "Intercept Only") depicts this effect graphically. Although the coefficient for the ashes effect (0.33) was not statistically significant, $t(106) = 1.72$, $p = .09$, it was in the predicted direction with a 95% confidence interval that contained many meaningfully large values (-0.05, 0.71), so we interpret it, though with caution. Exponentiating the sum that results from adding the intercept coefficient (0.24) to the coefficient for the nonsignificant ashes effect (0.33) yields the estimated mean amount of money non-Christian participants entrusted to targets who did wear ashes, which was $1.76—an amount 38.5% higher than the mean amount contributed to targets who did not wear ashes (see Table 2). The middle bar of Figure 2 (labeled "Ashes Effect Added") depicts this effect graphically. In supplemental analyses (accessible at https://osf.io/sbkqz/) in which we also included a level-2 variable to indicate whether participants received predominantly Christian upbringings (0 = no; 1 = yes), the coefficient for the effect of ashes on participants' trust game

Table 2
Hierarchical Linear Models for Experiment 2

Outcome	Fixed effect	Coeff	*SE*	*t*	*df*	*p*
Trust game allocations (dollars)	Intercept (γ_{00})	.24	.05	4.71	108	<.001
	Ashes effect (γ_{10})	.33	.19	1.72	106	.09
	Ashes by Christian interaction (γ_{11})	.06	.20	.29	106	.77
	Ashes by dollars kept (γ_{12})	−.12	.02	−4.99	106	<.001
Trustworthiness	Intercept (γ_{00})	4.08	.04	104.53	108	<.001
	Ashes effect (γ_{10})	.30	.11	2.72	106	.008
	Ashes by Christian interaction (γ_{11})	.26	.14	1.88	106	.06
	Ashes by dollars kept (γ_{12})	−.01	.01	−.67	106	.51
Attractiveness	Intercept (γ_{00})	3.19	.11	29.61	108	<.001
	Ashes effect (γ_{10})	.12	.13	.96	106	.34
	Ashes by Christian interaction (γ_{11})	−.11	.18	−.60	106	.55
	Ashes by dollars kept (γ_{12})	−.00	.02	−.20	106	.84
Submissiveness/Dominance	Intercept (γ_{00})	4.53	.05	97.51	108	<.001
	Ashes effect (γ_{10})	−.07	.16	−.47	106	.64
	Ashes by Christian interaction (γ_{11})	−.12	.19	−.65	106	.52
	Ashes by dollars kept (γ_{12})	−.01	.02	−.29	106	.77

Note. Coeff = coefficient.

allocations did not change substantially in magnitude or in statistical significance (coefficient = 0.37, *p* = .07). Likewise, the coefficient for the effect of ashes on participants' trust game allocations did not change appreciably (coefficient = 0.36, *p* = .08) when we included the 8-item measure of general religiosity as a simultaneous level-2 predictor instead of the measure of Christian religious upbringing.

Second, we consider results from an HLM in which trust ratings were the dependent variable (which was parallel to the models that we estimated for Experiment 1). As Table 2 shows, the coefficient for the ashes effect indicates that the ashes increased self-identified non-Christian participants' trust ratings by 0.30 units (*SE* = 0.11), which was statistically significant, *t*(106) = 2.72, *p* = .008. The middle bar of Figure 3 (labeled "Ashes Effect Added") depicts this significant effect graphically. In supplemental analyses (also accessible at https://osf.io/sbkqz/) in which we also included a

level-2 variable to indicate whether participants received predominantly Christian upbringings (0 = no; 1 = yes), the coefficient for the effect of ashes on participants' trust ratings dropped from 0.31 to 0.21 and became statistically nonsignificant (*p* = .15) although the coefficient for Christian upbringing (0.22) was nonsignificant as well (*p* = .15). Thus, we could not conclude confidently that self-identified non-Christians significantly had greater trust in individuals wearing ashes after we controlled for the possibility that they had come to view ashes as an in-group badge when they were children (although these results do not definitively prove that this developmental explanation is the correct one, either, since the effect for Christian upbringing was also nonsignificant). In a similar supplemental model in which we used the 8-item measure of general religiosity as a level-2 control variable, instead of the dummy variable that represented whether participants received Christian religious upbringings, the coefficient for the effect of ashes on participants' trust ratings did not change substantially
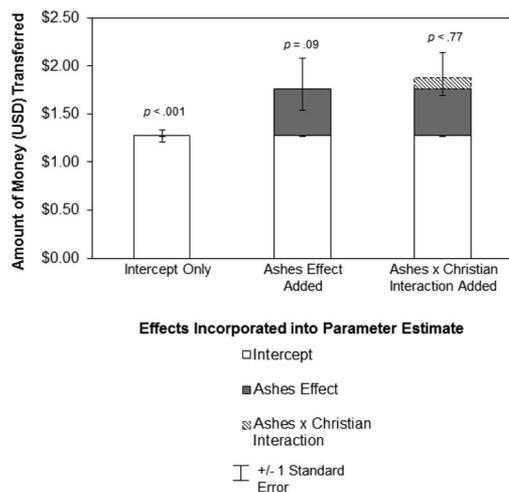

Figure 2. Contributions of the ashes effect and the Ashes × Christian interaction on amount of money (USD) transferred in the trust game (Experiment 2). Error bars = ±1 *SE*.
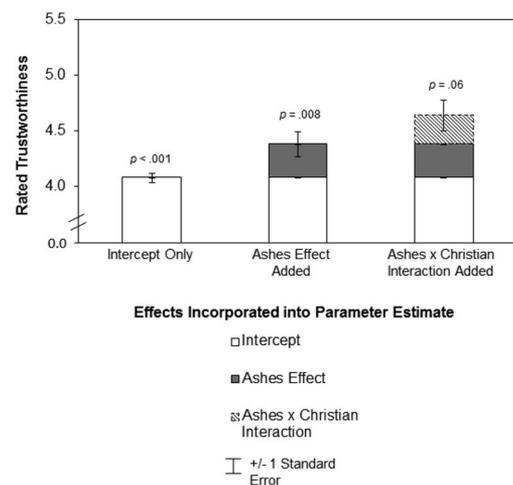

Figure 3. Contributions of the ashes effect and the Ashes × Christian interaction on rated trustworthiness (Experiment 2). Error bars = ±1 *SE*.

(coefficient = 0.32, SE = 0.12) and remained statistically significant (p = .006).

Therefore, contrary to Prediction 1, the ashes did not reduce trust for non-Christian participants. In fact, if anything, they appeared to increase ratings of trust and also appeared to increase trust game allocations, though the ashes effect was not statistically significant after Christian religious upbringing was controlled.

Testing Prediction 2: Do religious badges (ashes) increase trust among self-identified Christians? To evaluate this prediction, we first examined the coefficient for the dummy variable representing self-identification as "Christian" versus "non-Christian" in the Poisson model of the trust game data (labeled as the "Ashes by Christian interaction" in Table 2). In this model, the coefficient for "Christian" (0.06, SE = 0.20) was statistically nonsignificant, $t(106)$ = 0.29, p = .77, which indicates that the amount of money that self-identified Christians entrusted to the targets was not differentially influenced, relative to non-Christians, by whether the targets wore ashes. The third bar in Figure 2 (labeled "Ashes × Christian Interaction Added") depicts this nonsignificant interaction graphically. In a comparable model in which we predicted the effect of ashes on the amounts of money that participants entrusted to each target with a binary variable that took values of 0 for Christians and values of 1 for non-Christians (rather than 0 for non-Christians and 1 for Christians), the mean within-subjects effect of ashes (which represents the effect of ashes specifically for self-identified Christians) was 0.39 (SE = 0.18), $t(106)$ = 2.21, p = .03. Exponentiating this sum that results from adding the intercept (0.24) to this coefficient (.39) = yields $1.88. This estimate (which controls for the amount participants kept for themselves, as in the model in which non-Christians were assigned a value of 0 and Christians were assigned a value of 1) is interpreted as the amount of money that self-identified Christians can be expected to entrust to targets wearing ashes, which is roughly 47.4% higher than the amount that Christians are expected to entrust to targets not wearing ashes.

Second, we examined the coefficient for the dummy variable representing self-identification as "Christian" versus "non-Christian" in the multilevel model of the trust rating data (again, labeled "Ashes by Christian interaction"). For Christians, the effect of ashes was to increase trust ratings by 0.26 units (SE = 0.14; 95% CI: −0.02, 0.525) over and above their effect for non-Christians, which was not statistically significant, $t(106)$ = 1.88, p = .06, though nearly so, suggesting that Christians' ratings of targets' trustworthiness may be more strongly influenced (relative to non-Christians) by whether the targets are wearing ashes. The third bar of Figure 3 (labeled "Ashes × Christian Interaction") depicts this near-significant interaction graphically. In a separate model in which we predicted the effect of ashes on trust ratings with a binary variable that took values of 0 for Christians and 1 for non-Christians, the mean within-subjects effect of ashes (which represents the effect of ashes specifically for self-identified Christians) was 0.56 (SE = 0.10), $t(106)$ = 5.42, p < .001.

We had intended to evaluate whether recognition of the religious significance of the ashes explained why Christians rated targets wearing ashes as more trustworthy than did non-Christian participants. However, surprisingly, there was no association between self-identification as a Christian and recognition of the religious significance of the ashes, chi-$square$ (1) = 0.82, p = .37:

16% of non-Christians and 10.2% of Christians failed to identify the religious symbolism of the ashes. Therefore, we concluded that the tendency for Christians to rate ash-wearing men as more trustworthy than did non-Christians was not due to Christians' enhanced recognition of the religious significance of the ashes.

Testing Prediction 3: Was the effect of religious badges on perceived trustworthiness due to the confounding effects of religious badges on perceived attractiveness or submissiveness/dominance? As in Experiment 1, we sought to test this prediction by first running hierarchical linear models that were parallel to those specified in Equations 1 through 4, but which used the ratings of attractiveness and submissiveness/dominance, rather than the ratings of trustworthiness, as the dependent variable. We found that ashes did not significantly increase ratings of men's attractiveness (p = .34) or submissiveness/dominance (p = .64), and that these effects did not vary as a function of self-identification as a Christian versus non-Christian (ps = .55 and .52, respectively). Consequently, investigating these variables further as possible confounds of the effects of ashes on trust ratings was unwarranted. Therefore, we concluded that the apparent effects of ashes on participants' ratings of the targets' trustworthiness were not due to the confounding effects of religious badges on perceived attractiveness or submissiveness/dominance.

Discussion

Experiment 2, which extended Experiment 1, revealed that religious badges increased participants' rated trust in anonymous men, and also, with marginal statistical significance, their scores on a behavioral measure of trust, which was operationalized as the amounts they committed to transferring to those men during a multiplayer trust game. Furthermore, as in Experiment 1, the effect of the ashes on trust (measured via both ratings and trust game allocations) was positive both for Christians and non-Christians, though the effects of ashes among non-Christians were not statistically significant once Christian religious upbringing was controlled. In addition, as in Experiment 1, the effect of the ashes on ratings of trust was (marginally significantly) stronger for Christians than it was for non-Christians, though this Christian-specific enhancement did not obtain for the behavioral measure of trust. Although we initially suspected that this Christian-specific enhancement of the badging effect could be explained by an enhanced recognizability of the badge's religious significance to Christians, the data did not support this conjecture. Finally, as in Experiment 1, we also found that the trust-eliciting effect of this particular religious badge was not confounded with dominance/submissiveness or attractiveness.

Experiment 3

In Experiment 3, we extended Experiments 1 and 2 with a different religious badge—a necklace with the Christian cross on it—which we surmised would be more readily identifiable with Christianity than the ashes were (Chesner & Baumeister, 1985). As in Experiment 2, we examined whether this religious badge influenced both ratings of trust and investment decisions in a multiplayer trust game.

Method

Participants. Participants were 124 introductory anthropology students at the University of Connecticut. Four participants were omitted from analysis because of missing data. The remaining sample (M_{age} = 21.6 years, SD = 5.90, Range = 13–59 years) included 120 (78 female) participants. 76.6% of participants identified their ethnicity as White, 4.8% as Black, 2.4% as Latino, 8.9% as Asian, and 3.2% as other. Five participants did not report ethnicity. 37.1% of participants reported their religious affiliation as Catholic, 11.3% as Protestant, 3.2% as Jewish, 0.8% as Muslim, 4.0% as Hindu, and 1.6% as Buddhist. 32.3% reported no religious affiliation, and 9.7% reported their religious affiliation as "Other." Participants received a small amount of course credit, plus their earnings in the trust game, for participating.

Procedures. Procedures were very similar to the procedures in Experiments 1 and 2 except for modifications to the men's pictures that enabled us to study the effects of the Christian cross rather than ashes. Only seven of the 10 photographs from Experiments 1 and 2 were amenable to the digital addition of a necklace, so three additional faces from the FERET database were substituted for the three unsuitable ones. We photographed a real cross necklace and transferred the image to all 10 photos using GIMP editing software 2.6. The photos were standardized by size and resolution as in Experiment 1. Unlike in Experiments 1 and 2, targets' clothing on the upper torso was visible in Experiment 3.

Results

Testing Prediction 1: Do religious badges (crosses) reduce allocations in the trust game and trust ratings among non-Christians? To evaluate this prediction, we first consider results from a model of monetary allocations in the trust game. To analyze these data, we again included as a covariate (centered on 0) the amount of money that participants kept for themselves while we were examining the effects of the crosses on the amounts that participants entrusted to each of the 10 men: failure to account for between-subjects differences in amounts kept led to a nonsignificant effect for the crosses (coefficient = 0.16, p = .20). For consistency, the models
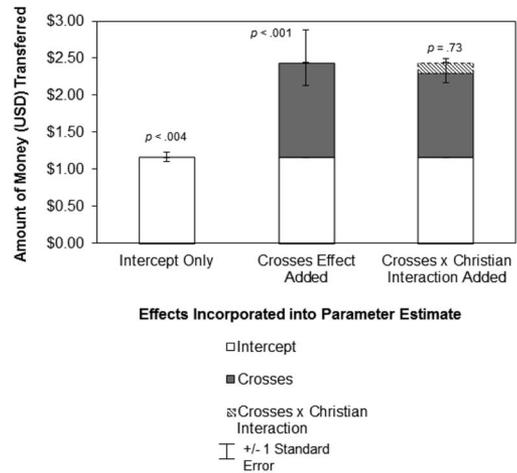

Figure 4. Contributions of the crosses effect and the Crosses × Christian interaction on amount of money transferred (USD) in the trust game (Experiment 3). Error bars = ±1 SE.

exploring the effects of crosses on the rating measures below also included this covariate. Also, as in Experiment 2, participants' trust game allocations were zero-inflated and overdispersed, so we modeled them here as well as a Poisson-distributed count variable with an overdispersion parameter (Atkins & Gallop, 2007; Raudenbush & Bryk, 2002).

As Table 3 shows, the intercept (0.15) for this model was statistically significant, $t(123)$ = 2.93, p = .004, which means that the typical non-Christian participant (i.e., one who scored 0 on the "Christian" variable) entrusted a nonzero amount of money to targets who scored zero on the "crosses" variable. Exponentiating the intercept coefficient yields $1.16 as the estimated amount of money non-Christian participants entrusted to targets who did not wear crosses. The first bar of Figure 4 (labeled "Intercept Only") depicts this value graphically. The coefficient for the "crosses effect" (0.74) was also statistically significant, $t(121)$ = 4.24, p < .001. Exponentiating the sum that results from adding the intercept

Table 3

Hierarchical Linear Models for Experiment 3

Outcome	Fixed effect	Coeff	SE	t	df	p
Trust game allocations (dollars)	Intercept (γ_{00})	.15	.05	2.93	123	.004
	Crosses effect (γ_{10})	.74	.17	4.24	121	<.001
	Crosses by Christian interaction (γ_{11})	−.06	.17	−.35	121	.73
	Crosses by dollars kept (γ_{12})	−.16	.02	−8.16	121	<.001
Trustworthiness	Intercept (γ_{00})	4.43	.04	112.97	123	<.001
	Crosses effect (γ_{10})	.40	.11	3.51	121	.001
	Crosses by Christian interaction (γ_{11})	−.21	.14	−1.52	121	.13
	Crosses by dollars kept (γ_{12})	−.02	.01	−2.11	121	.04
Attractiveness	Intercept (γ_{00})	3.15	.08	39.59	123	<.001
	Crosses effect (γ_{10})	.13	.11	1.17	121	.25
	Crosses by Christian interaction (γ_{11})	−.10	.14	−.72	121	.47
	Crosses by dollars kept (γ_{12})	−.04	.01	−3.31	121	.002
Submissiveness/Dominance	Intercept (γ_{00})	4.31	.04	99.40	123	<.001
	Crosses effect (γ_{10})	−.09	.15	−.58	121	.56
	Crosses by Christian interaction (γ_{11})	.20	.18	1.09	121	.28
	Crosses by dollars kept (γ_{12})	.01	.02	.62	121	.54

Note. Coeff = coefficient.

coefficient (0.15) to the coefficient for the crosses effect (0.74) yields the estimated mean amount of money participants entrusted to targets who wore crosses, $2.44, which implies that participants were estimated to have entrusted 2.1 times more money to men wearing crosses than to men not wearing crosses, which is statistically significant, $p < .001$. The middle bar of Figure 4 (labeled "Crosses Effect Added") depicts this effect graphically.

In supplemental analyses (accessible at https://osf.io/cdjvu/), in which we also included a level-2 variable to indicate whether participants received predominantly Christian upbringings (0 = no; 1 = yes), the coefficient for the effect of crosses on participants' trust game allocations became even larger (0.96) and maintained its statistical significance ($p < .001$). Results from a model in which we used general religiosity rather than Christian upbringing as the simultaneous level-2 control variable were similar.

Second, we consider results from models in which the rating-based measure of trust was the dependent variable. As Table 3 shows, the conclusions are largely the same as for the trust game allocations: For self-identified non-Christians, crosses increased participants' trust ratings by 0.40 units ($SE = 0.11$), which was statistically significant, $t(121) = 3.51, p = .001$. The middle bar of Figure 5 (labeled "Crosses Effect Added") depicts this significant effect graphically. In supplemental analyses (also accessible at https://osf.io/cdjvu/) in which we also included a level-2 variable to indicate whether participants received predominantly Christian upbringings (0 = no; 1 = yes), the coefficient for the effect of crosses on participants' trust ratings dropped slightly in magnitude (coefficient = 0.32) but remained statistically significant ($p = .001$). Similar results were obtained when we used general religiosity, rather than Christian upbringing, as the simultaneous level-2 predictor.

Therefore, contrary to Prediction 1, the crosses did not reduce trust for non-Christian participants. In fact, consistent with the results of Experiment 1 and (in the main) Experiment 2, they increased it. The effect of badges on non-Christian participants' trust could not be explained in terms of its covariation with religious upbringing or religiosity.

Testing Prediction 2: Do religious badges (crosses) increase trust among self-identified Christians? To evaluate this prediction, we first examined the coefficient for the dummy variables representing self-identification as "Christian" versus "non-Christian" in the Poisson model of the trust game data. In this model, the coefficient for the "Crosses by Christian interaction" (−0.06, $SE = 0.17$) was negative and statistically nonsignificant, $t(121) = -0.35, p = .73$, which indicates that the amounts that self-identified Christians (as opposed to self-identified non-Christians) entrusted to the targets was not differentially influenced by the targets' wearing of crosses. The third bar of Figure 4 (labeled "Crosses × Christian Interaction Added") depicts the nonsignificant effect graphically, shading the region attributable to the Crosses × Christian interaction to show that its effect on money transferred is a negative one. The standard error for the crosses by Christian interaction is placed at the bottom of the stacked element depicting this effect, rather than at the top of this stacked element, to reflect the fact that the effect of the crosses by Christian interaction was negative rather than positive.

In a separate model in which we predicted the effect of crosses on the amounts of money that participants entrusted to each target with a binary variable that took values of 0 for Christians and

values of 1 for non-Christians (rather than 0 for non-Christians and 1 for Christians), the mean within-subjects effect of crosses (which represents the effect of crosses specifically for self-identified Christians) was 0.68 ($SE = 0.17$), $t(121) = 4.06, p < .001$. Exponentiating the sum that results from adding the intercept (0.15) and this coefficient (0.68) yields a value of $2.29. This estimate (which controls for the amount participants kept for themselves, as in the previous model) is interpreted as the amount of money that self-identified Christians can be expected to entrust to targets wearing crosses, which is roughly 97.9% higher than the amount that Christians are expected to entrust to targets not wearing crosses.

Second, we examined the coefficient for the "Crosses by Christian" interaction in the hierarchical linear model of the trust rating data. For Christians, the effect of the crosses on trust was lower than it was for non-Christians, coefficient = −0.21 ($SE = .14$), $t(121) = -1.52$, though not significantly so, $p = .13$. The third bar of Figure 5 (labeled "Crosses × Christian Interaction Added") depicts this nonsignificant effect graphically, shading the region attributable to the Crosses × Christian interaction to show that its effect on rated trustworthiness is a negative one. The standard error for the crosses by Christian interaction is placed at the bottom of the stacked element depicting this effect rather than at the top of this stacked element to reflect the fact that the effect of the crosses by Christian interaction was negative rather than positive.

In a separate model in which we predicted the effect of crosses on trust ratings with a binary variable that took values of 0 for Christians and values of 1 for non-Christians (rather than 0 for non-Christians and 1 for Christians), the mean within-subjects effect of crosses (which represents the effect of crosses specifically for self-identified Christians) was 0.20 ($SE = 0.11$), $t(121) = 1.79$, which exceeded conventional criteria for statistical significance $p = .076$. However, the 95% confidence interval (−0.02, .41) contained mostly positive values.

In summary, the crosses appeared to increase monetary allocations in the multiplayer trust game for both non-Christians and Christians. The crosses also significantly increased non-Christians' trust ratings. Although the crosses did not significantly increase
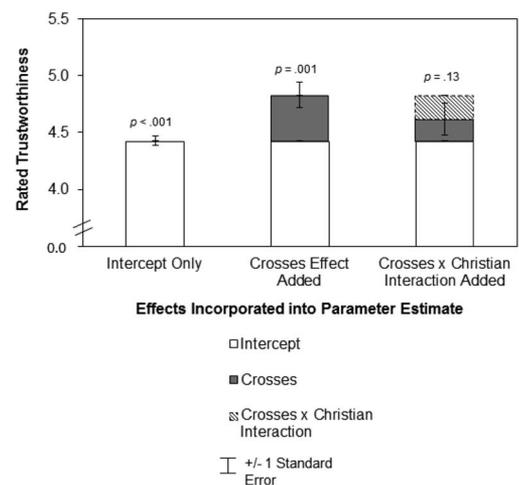

Figure 5. Contributions of the crosses and the Crosses × Christian interaction on rated trustworthiness (Experiment 3). Error bars = ±1 *SE*.

Christians' trust ratings, the effects of crosses on Christians' trust ratings (0.20) was also not significantly smaller than was the effects of the crosses on non-Christians' trust ratings (0.40). Thus, Experiment 2's results were generally supportive of Prediction 2, though not unequivocally so.

Testing Prediction 3: Was the effect of religious badges on perceived trustworthiness due to the confounding effects of religious badges (crosses) on perceived attractiveness or submissiveness/dominance? As in Experiments 2 and 3, we sought to test this prediction first by running hierarchical linear models that were parallel to those specified in Equations 1 through 4, but which used the ratings of attractiveness and submissiveness/dominance, rather than the measures of trustworthiness, as dependent variables. We found that crosses did not significantly increase ratings of men's attractiveness ($p = .25$) or submissiveness/dominance ($p = .56$), and that these effects did not vary as a function of self-identification as a Christian versus non-Christian (ps = .47 and .28, respectively). Consequently, investigating these variables further as possible confounds of the effects of ashes on trust ratings was unwarranted. Therefore, we concluded that the apparent effects of crosses on participants' ratings of the targets' trustworthiness were not attributable to the confounding effects of religious badges on perceived attractiveness or submissiveness/dominance.

Discussion

Experiment 3 revealed that the effects of religious badges on trust extended to a more common religious symbol—the wearing of a Christian cross on a necklace. Furthermore, the trust-eliciting effects of wearing a cross extended both to pencil-and-paper ratings of trust and to monetary transfers in a multiplayer trust game. Regardless of their affiliation with Christianity or Christian religious upbringing, participants rated cross-wearing men as more trustworthy. Also, as in Experiments 1 and 2, the effects of the cross necklaces on trust were not confounded by ratings of attractiveness or dominance/submissiveness. The effects of crosses on the rating-based measure of trust did not significantly vary across the two levels of participants' religious self-identification (non-Christian vs. Christian), contrary to what we found with the rating-based measures of trust in Experiments 1 and 2. Although this difference in Experiment 3 could have been caused by the fact that the religious symbolism of the cross is more readily discernible than is the symbolism behind the ashes that some Christians wear on Ash Wednesday, this interpretation is mooted somewhat by our failure to find differences in Christians' and non-Christians' ability to recognize the religious symbolism of ashes in Experiment 2. Sampling error, we think, offers a better explanation for the inconsistencies across experiments.

Experiment 4

In Experiment 4, we sought to ensure that the trust-eliciting effects of the crosses we discovered in Experiment 3 were not attributable simply to the necklaces themselves.

Method

Participants. Participants were 66 introductory anthropology students at the University of Connecticut. The sample size here is smaller than in Experiments 1–3 simply because enrollment in this particular course section was lower than in the sections in which Experiments 1–3 were conducted. Of the original 66 participants, 1 participant was dropped from analyses because of missing religious information. The remaining sample ($M_{age} = 19.35$ years, $SD = 1.32$, Range $= 18–25$ years) included 65 (38 female) participants. 69.7% of participants identified their ethnicity as White, 12.1% identified as Black, 4.5% as Latino, 9.1% as Asian, and 3.0% as other. One participant declined to respond. For religious affiliation, 36.4% of the sample identified themselves as Catholic, 21.2% as Protestant, 6.1% as Jewish, 1.5% as Buddhist, and 31.8% as ascribing to no religion; 1.5% reported their religious affiliation as "Other," and one person declined to respond. Participants received a small amount of course credit, plus their earnings in the trust game, for participating.

Procedure. The stimuli and measures in Experiment 4 were identical to those in Experiment 3, except that the crosses were omitted from the necklaces and the face rating sheet was different from the face rating sheet used in Experiment 2. At the end of the experiment, we evaluated participants' suspicion about the experiment with a single item ("Did anything strike you as odd or unusual about the set of pictures you just saw?"), which participants completed after sealing their responses to the other procedures in an envelope. In response to this item, 2 participants mentioned the necklaces, and 25 participants mentioned that they found it unusual that they were shown only pictures of men. None of these suspicions seemed to merit excluding any participants, so we analyzed data from all 65 participants.

Results and Discussion

By conducting a Poisson model on the trust game data, as in Experiments 2 and 3, we found in Experiment 4 that the necklaces (without crosses) did not significantly affect the amounts of money that participants entrusted to the 10 men, as indicated by a "Necklaces" coefficient $= -0.00$ ($SE = 0.31$), $t(62) = -0.01$, $p = 1.00$ (see Table 4).

In the hierarchical linear model of the trust ratings, we also found that the necklaces (without crosses) also did not influence participants' trust ratings, as indicated by a "Necklaces" coefficient $= -0.09$ ($SE = 0.21$), $t(62) = -0.42$, $p = .67$.

Likewise, the coefficients representing the increase in the badges' effect specifically for self-identified Christians (the "Necklaces by Christian" interaction coefficients in Table 4) were statistically nonsignificant both for money entrusted to the 10 men in the Poisson model ($p = .72$), and for the ratings of the men's trustworthiness ($p = .80$).

Thus, we concluded from Experiment 4 that the effects of the crosses on trust, which we identified in Experiment 3, could not be attributed to the effects of the necklaces, but instead, were apparently due to the effects of the crosses themselves.

General Discussion

Virtually every religious group is characterized by at least one form of bodily modification, item of dress, or adornment that identifies its wearer as a member of that religion. We assume that the ubiquity of religious badges comes from their ability to help people regulate their social relationships in diverse contexts, per-

Table 4
Hierarchical Linear Models for Experiment 4

Outcome	Fixed effect	Coeff	SE	t	df	p
Trust game allocations (dollars)	Intercept (γ_{00})	.39	.05	7.42	64	<.001
	Necklaces effect (γ_{10})	−.00	.31	−.01	62	1.00
	Necklaces by Christian interaction (γ_{11})	.12	.33	.36	62	.72
	Necklaces by dollars kept (γ_{12})	−.19	.06	−2.97	62	.01
Trustworthiness	Intercept (γ_{00})	4.35	.06	74.68	64	<.001
	Necklaces effect (γ_{10})	−.09	.21	−.42	62	.67
	Necklaces by Christian interaction (γ_{11})	−.07	.26	−.25	62	.80
	Necklaces by dollars kept (γ_{12})	.02	.03	.76	62	.45

Note. Coeff = coefficient.

haps including the enforcement of restrictive sexuality (Kurzban, Dukes, & Weeden, 2010; McCullough, Carter, DeWall, & Corrales, 2012; Weeden, Cohen, & Kenrick, 2008) and the formation of alliances (DeScioli & Kurzban, 2013). Here we considered how such adornments could be used to promote pro-social behavior toward coreligionists (Norenzayan & Shariff, 2008) by inducing trust.

In this vein, we hypothesized that religious badges should make their bearers seem less trustworthy to individuals who are not members of the implied religion, and more trustworthy to members of the implied religion. Our results present a considerably more nuanced picture. First, we found that two different religious badges that mark an individual as a Christian did not reduce non-Christian participants' trust (measured via both a rating scale and allocations in a trust game) in the targets they viewed; in fact, these religious badges *increased* non-Christians' trust in the targets across five different statistical tests involving two different measures of trust (see Figures 1 through 5). The trust game results of Experiments 2 and 3 are of particular interest inasmuch as they revealed that Ash Wednesday ashes (Experiment 2) increased (albeit with only marginal statistical significance) the amounts of money that non-Christians entrusted to targets by 38.5%, and that a Christian cross (Experiment 3) more than doubled the amounts of money that non-Christians entrusted to targets. Thus, rather than reducing out-group members' trust, the two religious badges we investigated here increased it. By and large, these effects among non-Christians did not disappear when we controlled for whether participants had been raised as Christians or for general religiosity. This pattern of results suggests that non-Christians' willingness to trust people wearing ashes or crosses was neither the psychological residue of an upbringing in which they had learned to view ash- and cross-wearers as members of their own in-groups nor a by-product of non-Christians' lower religiosity in general.

As predicted, we did find that the Christian badges increased Christian participants' trust in the targets they viewed. However, contrary to our prediction, the effects of these badges on Christian participants' trust were not uniformly stronger than they were for non-Christian participants. For Experiments 1 and 2, in which we used Ash Wednesday ashes as our religious badge, we found that Christian participants' *ratings* of trust were enhanced by the ashes to a greater extent than were the ratings of their non-Christian counterparts, but in Experiment 3 the effect of wearing crosses on participants' trust ratings was slightly lower (though not significantly so) for Christians than for non-Christians. The trust game data from Experiments 2 and 3 were less equivocal: In neither

study did Christians meaningfully differ from non-Christians in the extent to which the religious badges influenced their trust game allocations.

Taken together, these findings broadly suggest that two badges that commonly signify affiliation with the Christian religion (at least in the United States) increase the perceived trustworthiness of their bearers—among both Christian university students and non-Christian ones—and that the effects of these religious badges are specific to trust rather than to attractiveness or submissiveness/dominance. In subsequent experiments, Shaver et al. (2014) extended this research design to Christian and Hindu samples in Mauritius. They found that men displaying ethnically appropriate markers of religious identity were rated as more trustworthy than were those men who were not wearing such markers, regardless of the ethnicity or religious affiliation of the target, or of the rater. Furthermore, they showed that ratings of trustworthiness mediated decisions in a trust game, in which proposers sent more money on average to religiously identified men. It would be of interest to replicate these experiments (using badges that signal membership in the relevant religious groups) in still other parts of the world—particularly in places where contemporary religious conflict is more pronounced.

Having failed to find evidence that people (New England university students, at least) use religious badges to regulate their trust-related behavior along coalitional lines, we are left with the puzzle of why Christian religious badges appear to increase both Christian and non-Christian raters' trust (though, perhaps, to a greater extent among Christians than among non-Christians). Perhaps the finding is unsurprising as signaling theorists have previously posited that individuals might use the religious signals of outgroups to assess cooperativeness and trustworthiness (Frank, 1988; Sosis, 2005, 2006). Recent findings are consistent with this suggestion.

For example, Hall, Cohen, Meyer, Varley, and Brewer (2015) examined how Christian participants perceived the trustworthiness of Muslim and Christian individuals who did or did not engage in religious costly signaling, operationalized as making charitable donations and adhering to dietary restrictions. They found that religious commitment increases trust within religious groups, as well as across religious lines. Likewise, Shaver et al. (2014) found that Mauritian Hindus rated Africans wearing a cross to be more trustworthy than those without a cross, and Africans rated Hindus wearing Hindu prayer ashes to be more trustworthy than those without prayer ashes. Relatedly, Gervais (2011) suggests that Americans (both Christian and non-Christian)—and perhaps peo-

ple from other nations as well—use religious commitment as a heuristic cue to a target's trustworthiness in part because of a (correct or incorrect) belief that religious people's belief in supernatural agents restrains dishonesty through the fear of supernatural punishment (D. D. P. Johnson, 2005; cf. Hall et al., 2015).

A variant of this proposition focuses on the belief that religious people are more concerned about punishment from others as a result of the moralizing to which they are exposed through their participation in public religious activities over the life course (McCullough & Willoughby, 2009). Both of these interpretations accord well with several findings. For instance, as noted in the introduction, U.S. survey respondents report greater trust for believers in God than for atheists—irrespectively of the religion to which those believers subscribe (Shariff & Clark, 2013). More generally, as Galen (2012) wrote, "the assumption that religiosity is associated with prosociality constitutes, in a majority of contexts, a ubiquitous general stereotype" (p. 878).

Another possibility, not totally unrelated to the first, relates to the fluid and peaceably multireligious nature of contemporary religious life in the United States. Here, religious heterophily in marriage, friendship, and other domains of social life are increasingly common, particularly among young people (Putnam & Campbell, 2010). In such religiously fluid social contexts, people from one religious group (e.g., non-Christians) might use the religious badges of another group (e.g., Christians' Ash Wednesday ashes and necklaces with crosses) as cues to the trustworthiness of strangers because they have experienced their Christian friends, family members, and neighbors, and business associates as trustworthy, and generalize outward from those direct experiences.

Although our experiments benefited from strong experimental controls, the judgments and decision-making tasks we used were somewhat artificial compared to the assessments that people make of religious badges in the course of their day-to-day lives. Future work on religious badges should aim for greater realism—possibly through field experiments with ethnographers—than we achieved here. Our results are also constrained by the limited nature of the badges we studied, the limited nature of the targets we portrayed as wearing those badges, and the limited population from which we sampled our participants. To address these concerns, and to study the implications of these results further, three directions for future research seem particularly profitable. First, it would be useful to determine whether religious badges exert their effects on trust by way of their effects on perceivers' beliefs that the badge-wearer is sensitive to supernatural punishment concerns (Gervais, 2011; Gervais et al., 2011). Second, as noted above, we think it would be useful to examine the generalizability of the conclusions we have drawn here by examining the effects of religious badges from religions other than Christianity on the trust of both in-group and out-group perceivers in different religious contexts and nationalities. We are particularly impressed with Norenzayan and Gervais's (2013) finding that prejudice toward atheists is milder in nations with a strong secular rule of law; correspondingly, we wonder whether the effects of religious badges on trust covary cross-culturally with the strength of secular legal institutions. Finally, we remain interested in whether these results would replicate in nations in which religious groups are currently, or have recently, been locked in particularly strenuous or violent political conflict. As important as religion often is as a fault line for intergroup conflict, understanding the conditions under which re-

ligious badges can both undermine and enhance social trust seems important for further progress in the global study of intergroup relations.

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