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# Trust in the image of God: Links between religiosity and reciprocity in Haiti

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## Abstract

Are religious believers more prosocial than other people? In a trust game field experiment with 774 subjects in Haiti, we elicit willingness to pay to play in the presence of religious images, and argue that this can be interpreted as a measure of the strength of religiosity. More religious individuals trust others more and reciprocate more than others, with effect sizes between 14% and 21% of mean behaviour depending on the measure. They do not reciprocate more in the presence of religious images than without them, nor towards members of the same denomination as themselves. The results support the view that religious affiliation is correlated with intrinsic trustworthiness. We show that lab behaviour correlates with intuitive measures of religiosity outside the lab and with participation in borrowing and lending networks.

**KEYWORDS**
field experiment, religion, trust

**JEL CLASSIFICATIONS**
D81; Z12

# 1 | INTRODUCTION

Are religious believers more prosocial than other individuals? The answer matters because religious organizations frequently impose high financial, behavioural and cognitive costs on their members, costs that can seem disproportionate to the intrinsic value of the direct services they provide. A now influential tradition since Iannaccone (1992, 1994) holds that religious organizations provide club goods and specifically the club good of access to other highly motivated adherents.[1]

More generally, religious organizations can be considered as platforms. These platforms provide their members with (among other services) access to other members of a higher quality in some relevant dimensions than they would meet through other less costly channels. Relevant dimensions typically include trustworthiness in ethical and economic dealings. A testable implication of this hypothesis is that religious adherents will indeed be of higher quality than otherwise similar individuals who are not religious adherents, or not to the same degree. If they were not, religious organizations would lose members to other less costly or more reliable platforms. This paper tests that hypothesis experimentally in the challenging field context of Haiti.

In this paper, we report a lab-in-the-field experiment in which 774 subjects in different regions of Haiti played trust games. The trust games consisted of two parts. First, subjects played a standard protocol (which we call hereafter the "neutral" version), both as a truster and as trustees. Second, subjects played in the presence of religious images of Catholic, Protestant or Voodoo traditions (which we call hereafter the "image" version). These three religions are the main and only religions with a substantial presence in Haiti. In the image version, subjects also played as a truster and as trustee. We develop a measure of the degree of subjects' religious adherence, based on subjects' willingness to purchase one of the religious images to accompany them as they play as trusters in the image game.

We test the hypothesis that religious adherents, defined as subjects who purchased a religious image, behave in a more trustworthy fashion than non-adherents. We show that they do, with large effect sizes (between 14% and 21% of mean behaviour depending on the measure). We also test to what degree our measure of religiosity corresponds to common sense indicators of religious behaviour outside the laboratory. We thereby show that it is reasonable to interpret willingness to purchase religious images as an indicator of religiosity rather than, say, aesthetic preference. Finally, we provide suggestive evidence that religiosity, and to some extent reciprocity independently of religiosity, are associated with greater participation in local borrowing and lending networks.

We were also interested in investigating individual risk-taking behaviour and religious belief. The results related to this are presented in our companion paper (Auriol, Delissaint, Fourati, Miquel-Florensa, & Seabright, 2019). Since it was too challenging logistically to run two separate sets of experiments, the 774 subjects also played lotteries as part of the same experiment, with and without religious images.[2] Image buyers bet more than non-buyers in all lotteries. In addition, in the presence of religious images, all participants took more risk. Our results suggest that the presence of images tends to increase individuals' subjective probability of winning the lottery, and that subjects therefore

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[1]Other important contributions include Berman (2000), Irons (2001) and Bulbulia (2004), as well as the literature surveyed in the paper.

[2]They played lotteries both in the neutral standard protocol and with the three religious images. In a fifth game, they could choose between paying to play a lottery with an image of their choice and saving their money to play with no image (see Auriol et al., 2019, for more details).

believe in a God who intervenes actively in the world in response to their requests. The trust game and the lottery were played in an order that was randomized by session, and in both papers we include regressions that control for session fixed effects.

Our work links to a growing literature on the economic consequences of religious behaviour. There is historical and ethnographic evidence of the association of religion with attitudes conducive to economic growth and development (Chen, Wang, & Yan, 2013; Guiso, Sapienza, & Zingales, 2003; McCleary & Barro, 2003, 2006; Putnam & Campbell, 2012), with prosocial behaviour more generally (Ahmed, 2009; Henrich et al., 2010), with the provision of economic services such as insurance (Auriol, Lassebie, Panin, Raiber, & Seabright, 2020), and with the evolution of social and political complexity (Watts et al., 2015). There is also evidence of the role of religion in building social and economic trust, either by inducing more trustworthy behaviour (Norenzayan, 2014) or by enabling adherents to signal trustworthiness to others (Bulbulia, 2004; Iannaccone, 1994; Irons, 2001). It may facilitate the cultural transmission of behavioural practices by enhancing the credibility of the utterances of cultural role models in the eyes of those who copy their behaviour (Henrich, 2009).

Aldashev and Platteau (2014) surveyed the literature investigating the links between religion, culture and development. They covered many aspects of the literature, including the effect of religion on individual behaviour. In particular, they criticized cross-country studies because they tend to fail to capture the various religious denominations and the intensity of religious adherence. Our experimental data enable us to overcome this limitation in several ways. First, we focus on one country and our sample is nationally representative with respect to religious denominations in Haiti. Secondly, our approach embodies in an incentive-compatible way the intensity of religious attachment. Finally, our survey questionnaire contains an extensive set of questions associated with religious faith and practices, including various questions specific to Voodoo practices that correlate with the revealed intensity of religious attachment of our subjects. Consistent with the studies reviewed by Aldashev and Platteau (2014), we find that more religious people are more trusting than less religious ones (see Guiso et al., 2003, for cross-country evidence on this link). We find that more religious people are also more trustworthy than others, which is new. These results are based on actual behaviour in games.

Even where the evidence in the literature is credible,[3] it is often silent about possible confounding factors, as well as about the causal mechanisms involved. For example, if there is a robust statistical association between religion and trustworthy behaviour (see Delavande & Zafar, 2015, for an experimental association between madrassa attendance and both trusting and trustworthy behaviour in Pakistan), is this because religious adherence changes behaviour, making individuals more trustworthy than they would otherwise be? Or do individuals who are in any case relatively trustworthy select into religious membership, which then acts as a costly signal of their reliable character? In other words, does religious membership signal the reliable character of adherents, or a reliable situation in which to interact with adherents? And to whom does it address this signal – to fellow adherents or to the general population?

As far as the likely causal mechanisms are concerned, the emerging consensus among evolutionary anthropologists of religion (Norenzayan, 2013; Norenzayan et al., 2016) appears to be that religious belief and practice can be causally effective in building social trust, for four main reasons. First, adherence to religions with "Big Gods" who observe human behaviour and punish norm violation is associated with more prosocial behaviour on the part of adherents than of non-adherents. Secondly,

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[3]See Norenzayan and Shariff (2008) for a critique of the credibility of the self-reported behavioural evidence offered in Brooks (2007).

adherence works primarily by changing the behaviour of adherents and not by signalling their more reliable intrinsic character.[4] Thirdly, their behaviour becomes more cooperative towards co-religionists and may or may not become more hostile towards outsiders (adherence is a club good).[5] Fourthly, costly religious group membership distinguishes genuine adherence from cheap talk.

However, no such consensus appears to have formed among economists studying religion, who have accorded importance both to the role of religion in changing behaviour and to its role in enabling individuals to signal their intrinsic trustworthiness (Iannaccone, 1994). This raises the question of what distinguishes more from less intrinsically trustworthy individuals, and why this should be correlated with religious adherence. One view is that individuals differ in the degree of utility they derive from what happens to others (Becker, 1974). An alternative view is that the most significant way in which individuals differ in their trustworthiness is in their willingness to respect social norms (Bernhard, Fehr, & Fischbacher, 2006; Fehr, Fischbacher, & Gächter, 2002).

These two forms of motivation do not exhaust the variety of possible types of reasons why individuals differ in their trustworthiness. For instance, various writers have appealed to self-image concerns (Bénabou & Tirole, 2006; Brekke, Kverndokk, & Nyborg, 2003), which are not precisely reducible to combinations of altruism and respect for norms.

There are some experimental papers on prosocial behaviour that test the impact of religious priming on subjects' trustworthiness. A notable example is the paper by Benjamin, Choi, and Fisher (2016), who randomly assigned 827 Cornell University students to complete a religion-salient or neutral sentence unscrambling task. After completing the sentence unscramble, the subjects participated in different games: a public good game, a risk aversion elicitation, a discount rate elicitation and a dictator game. The authors assess, within each of the self-declared religious affiliations in their sample, whether their religious priming treatment affects subjects' attitudes with respect to each of the games played.

Closer to our work, Hadnes and Schumacher (2012) conducted an experiment in 18 villages around Ouagadougou to investigate the impacts of traditional beliefs on trust and trustworthiness. Burkina Faso is similar to Haiti in the sense that, while most people declare belonging to a monotheist religion, they also hold strong traditional beliefs. The authors rely on priming methods to vary exogenously the salience of those traditional beliefs and measure the impact of their salience on trust. Before playing the trust game, half of the participants (the treatment group) are randomly assigned to semi-structured interviews focusing on traditional beliefs and the other half to interviews about every day business routines (the control group). Then, the trust game consists of a between-subject design where half of the participants of both the treatment group and the control group play as the sender, and half as the receiver. Senders have the choice between sending their entire endowment and sending nothing. Any amount sent by the sender is doubled before it reaches the receiver. Without being told how much the sender has sent, receivers are asked to choose the amount (in multiples of 500 Fcfa) they wish to send back, up to a maximum of the largest payout they can receive (which is their show up fee plus twice the endowment of the sender). Results show that subjects in the treatment group, both senders and receivers, send significantly more than subjects in the control group.

In our experiment, the subjects first play the trust game in a neutral context as truster and as trustee, without any mention of religion. In the second round of the game, the images are introduced: images

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[4]This causal effect is demonstrated in priming studies, where subjects behave more prosocially in the presence of a prime such as a religious text or image from the denomination to which they adhere (Hadnes & Schumacher, 2012; Norenzayan, 2014; Randolph-Seng & Nielsen, 2007). However, sorting by preference may also occur (Aimone et al., 2013), and there is a role for costly signalling in distinguishing those who genuinely believe in the existence of Big Gods from those who do not.

[5]Berman and Laitin (2008); Choi and Bowles (2007).

of Catholic, Protestant and Voodoo significance. As trusters, subjects are given the opportunity to buy privately one of the three images (or none of them), and as trustees, subjects receive boxes containing one of the images at random.

The role that religious images play in this game is not equivalent to priming as this is normally understood. Priming occurs when an idea or a concept is brought subtly to the attention of experimental subjects without being explicitly mentioned and without any suggestion of relevance to the experiment. In our case, subjects playing as senders are explicitly given the choice whether to pay to place a religious image in the cup in which they send tokens to the trustees.

One major advantage of our protocol is that it allows us to obtain a measure of our subjects' intensity of religious belief (and not just their self-declared religious affiliation). After having played a standard trust game both as trusters and trustees, players are proposed a second round where they are given the opportunity to add to their send box a religious image that involves a cost (20% of their endowment): the fact that some subjects choose to buy an image is not a cheap choice. It is revealing of the subject's attachment to the chosen image, which is strongly correlated with the subjects' self-declared religion as well as with other self-reported measures of religious practice. Since almost all participants in our experiments declare themselves to be religious to some degree, we interpret the difference between buyers and non-buyers as a difference in intensity of religiosity rather than a difference between the religious and the non-religious.

We find that image buyers return significantly more on average than non-buyers. Our experimental results do not show any club good effect: image buyers send on average the same amount to co-religionists as to other players. Moreover, we do not find significant effects of the presence of religious images on reciprocity: our subjects' return choices are statistically the same whether they play receivers in the presence of a religious image or in the neutral case.

Overall, our results strongly support the hypothesis that religious adherence *is correlated with* trustworthiness. Given the fact that others do not respond differently to those playing with and without images, we cannot conclude that religious adherence functions as a signal. Our results do not provide any positive support for the view that religious adherence *enhances* trustworthiness, though they are consistent with it doing so in other settings. Our results may reflect the fact that Haiti has no strong divisions across religious denominations: almost all citizens acknowledge either a Protestant or a Catholic faith (with both groups open to Voodoo practices to different degrees), and many Haitians appear to switch easily between denominations.

These results are of importance to many countries that have been living through major economic transitions. In the former Soviet Union, as well as in China, reported adherence to religion has been growing very fast in recent years in spite of the strongly atheistic ideology to which populations were formerly exposed. It seems reasonable to conjecture that the turn to religion is not just the artefact of population rebounding from a previously extreme indoctrination, but also results from the need to find sources of social trust in an often bewildering and disturbing social and economic environment. Further research is much needed on the specific nature of religiosity in transition countries, but establishing a link to trust and trustworthiness is an important component of such an argument.

Section 2 of the paper describes our experiment, and Section 3 describes the Haiti field setting. Section 4 gives the results of the experiment. Section 5 considers questions of external validity, and Section 5 concludes.

## 2 | THE EXPERIMENT

Trust games have become a standard method in the literature for assessing both trustworthiness and willingness to trust others (Berg, Dickhaut, & McCabe, 1995; Johnson & Mislin, 2011). With the goal of

(a) Catholic                    (b) Voodoo                    (c) Protestant

**FIGURE 1**    Images for the different religious denominations

analysing how both trust and trustworthiness may be influenced by the possibility of signalling religious beliefs, we proposed an experimental protocol that involved playing the standard trust game with a twist: first the game was played in a neutral condition, alternatively as a truster and as a trustee, with all players either sending or receiving boxes with tokens in them corresponding to the chosen monetary amounts. Next we offered the participants the opportunity to play the truster game again, with the possibility of adding a religious image to the box at a price equal to 20% of their endowment. Finally, participants played as trustees, receiving boxes with tokens and a religious image that were introduced in a random order. All experiments were conducted in the Kreyol language by native speakers.

The participants were offered the choice between the three religious images shown in Figure 1: one related to the Catholic faith, one related to the Voodoo faith and one related to the Protestant faith. These images were chosen with the aid of religious leaders of each faith. In pilot sessions prior to the main experiment, we verified that participants clearly associated the image with the religion concerned. All games were paid at the end of the experimental session, and no information was revealed between the successive rounds of the games.

Figure 2 shows the structure of the trust game in our experiment (see Appendix B for more details). The neutral case preceded the image treatment to avoid that the subjects think of images in the baseline condition, and to allow us to compare their behaviour in the neutral and image cases.[6]

## 2.1 | Neutral trust game

The neutral game followed the classical structure: participants were given five tokens and could secretly place any whole number of them into a box. The amount deposited was tripled and the behaviour of the subjects from the same session when playing the role of receivers determined what proportion of the resulting amount was returned to the senders. After playing once all as senders, subjects all played twice the receiver role following a partial strategy method: they were asked for their choice when receiving a box containing six and 12 tokens (in a random order).

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[6]The experimental sessions included the trust game presented in this paper and a lottery game explored in Auriol et al. (2019). The order of the lottery and trust game was randomized.

**Neutral game**

| Role | Box Content | Choice | Payment |
|------|-------------|--------|---------|
| Sender | 5 tokens | number of tokens to send | tokens kept + (number sent $\times 3 \times$ Av group Ret ) |
| Recipient 1 | 6 tokens | number of tokens to keep | tokens kept |
| Recipient 2 | 12 tokens | number of tokens to keep | tokens kept |

**Image game**

| Role | Box Content | Choice | Payment |
|------|-------------|--------|---------|
| Sender | 5 tokens | number of tokens to send | tokens kept - image cost + (number sent $\times 3 \times$ Av group Ret ) |
| Recipient 1 | 6 tokens + image | number of tokens to keep | tokens kept |
| Recipient 2 | 12 tokens + image | number of tokens to keep | tokens kept |

Notes: The table presents the structure of the games played. All sessions started with the neutral trust game, that was followed by the image game. The order of the return boxes was randomized in the different sessions. The payment of the senders is based on "Av group Ret", which is the group return averaged in each session across participants and across the two boxes with 6 and 12 tokens respectively. The image cost is 1 token if an image is chosen, and zero tokens otherwise.

**FIGURE 2**    Structure of the trust game(s)

## 2.2 | Image treatment trust game

In the image treatment, subjects first played as senders and were allowed secretly to place in their box one of three images, representing Catholic, Protestant or Voodoo traditions, at a cost of one token, equal to 20% of the endowment; they could also choose to send no image. When they played trustee, they received a box containing one of the three religious images and the experimental currency, which they had to divide between an amount kept and an amount returned. They played twice: as receivers of one box containing six tokens plus an image, and one containing 12 tokens plus another image (the orders of the two boxes, as well as of the images they contained, were randomized at the session level).

Participants were told that their choices could not be observed by any other participant in the room, and all means feasible were put in place to ensure privacy. Participants' behaviour (taking care to keep hidden their selection of the image from the box, for instance) suggested that this undertaking was considered credible. Senders were told that their amounts would be sent to "someone in their community" but that their identity could not be guessed by any such receiver. Receivers were told that they should consider the amounts they received as coming from "someone in their community" whose identity they would not be able to guess.

## 2.3 | Partial strategy method

The reasons for implementing the receiver role with a partial rather than complete strategy method were twofold.[7] First, the field context was very challenging. The experiment took place in rural Haiti

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[7]With the strategy method, subjects are asked to indicate an action in each information set. The advantage of this method is twofold. First, it provides more information about players' behaviour in the different situations. Second, it makes the implementation in a lab-in-the-field setting easier, since it does not require processing information about the sender as an intermediate stage and allows all the calculations to be made at the end of the session. The drawbacks of this method are that incentives may be weaker, given that each information set is not reached for sure, and, more importantly in our Haitian context, it is abstract and hard to grasp for illiterate players. Brandts and Charness (2011) reported evidence on the equivalence of direct and strategy methods in terms of results.

less than 2 years after a major earthquake. The conditions were extremely harsh with poor infrastructure (few paved roads, sporadic access to electricity, etc.) and security concerns. These conditions made it impossible to transport a computerized lab into the field. In most of the experimental settings it would have been impossible to power 25 laptops, not to mention the risk of attracting unwelcome attention with our valuable equipment.

Secondly, a significant minority of our subjects were either illiterate or had very low levels of literacy. Our pilot study revealed that it would be a major challenge to convey to them the abstract thought required by economic experiments, especially the strategy method. We therefore opted for a very concrete and visual way to represent strategy choices: our sender subjects were endowed with physical tokens that they could place in an opaque box, and when they played as receivers received the same types of box containing various numbers of tokens. In the image treatments they had the choice to add a physical image to their box when playing as sender, and they received a physical image in their box when playing as receiver.

The logistics of the experiment made it infeasible to match senders and receivers directly in a randomized fashion without incurring long delays between games, nor compute their payoffs instantaneously. The pilot sessions also showed that eliciting a complete strategy for both the neutral and the image games was too lengthy. In total, it would have involved playing twice as senders, and replying as recipients for five boxes in the neutral game and 12 boxes in the image games, in order to take account of the three images.

With so many decisions to be made by participants, in addition to the time spent to set up the session and after to administer the questionnaire, it would not have been possible to keep the participants' interest and concentration. We chose to elicit receivers' responses to boxes containing six and 12 tokens to be able to compare their reactions to the same monetary incentive with and without an image. These responses were used to calculate an average return rate per session, which was then multiplied by the amount each sender sent, to yield a payoff to senders that reflected both their individual trustiness (the amount they chose to send) and the average trustworthiness of the individuals in their session. We also remunerated individuals for both their choices as trustees instead of randomizing between them, hence avoiding the incentive problems typically posed by such randomization.

## 2.4 | Matching participants

Two features of the beliefs of participants about the partner in the trust game were relevant in our experiment. First, participants were playing simultaneously in the same room; given the public nature of the experimental announcement and the setting, it was impossible for participants to believe that other people in the locality could be participating in the game without being in the room. Given that we could not realistically have explained in detail to this group exactly how the mean return rates were calculated without causing confusion among the less literate and numerate participants, telling participants that their partners were "from their community" was the most consistent and comprehensible way we could find to communicate the fact that their payoffs would be determined by the average reciprocity of the group.

Secondly, the anonymity of partners in our set-up ruled out the possibility of norm enforcement by other members of their overall community or their religious denomination. Such norm enforcement has been shown to be important in some settings (see for instance Bernhard et al., 2006; Goette, Huffman, & Meier, 2006; Tajfel & Turner, 1979). However, in our context, the only way in which group membership could have affected outcomes was by affecting the intrinsic motivation of subjects to cooperate (or not) with other individuals.

**FIGURE 3** Map of Haiti. The red dots mark the locations where the experiment took place

## 3 | FIELD SETTING: HAITI

Haiti, the first Caribbean state to achieve independence, occupies the western third of Hispaniola Island, shared with the Dominican Republic. Mountainous with a tropical climate, it is the poorest country in the Americas due to decades of violence and instability. Haiti's Human Development Index value for 2014 is 0.483, which puts the country in the low human development category, positioning it at 163 out of 188 countries and territories.[8] In Haiti, in 2012, the incidence of multidimensional poverty was 47.6%, and the intensity of deprivation was estimated at 48.6%.[9] A Gini coefficient on income of 0.6 makes it one of the most unequal countries in the world. Political instability has been a characteristic of Haiti's recent history, with important elites controlling economic and political power (Naidu, Robinson, & Young, 2015).

The study, which was conducted between November 2012 and February 2013, involved 774 subjects in six regions of Haiti, who took part in 33 sessions of between 18 and 25 participants each. The

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[8]This number is below the average of 0.505 for countries in the low human development group and below the average of 0.748 for countries in Latin America and the Caribbean. Source: UNDP Human Development Report, 2012. See http://hdr.undp.org/en/composite/trends.

[9]Multidimensional Poverty Index (MPI) identifies multiple deprivations at the household and individual level in health, education, and standard of living. It was developed in 2010 by the Oxford Poverty Human Development Initiative (OPHI) and the United Nations Development Programme. The MPI reports the incidence of multidimensional deprivation (a headcount of those in multidimensional poverty) and its intensity (the average deprivation score experienced by poor people; see http://hdr.undp.org/en/composite/MPI).

**TABLE 1**  Summary statistics, socio-demographic characteristics

| | Experimental sample | | | | | DHS 2012 |
|---|---|---|---|---|---|---|
| | Obs | Mean | *SD* | Min | Max | Mean |
| Rural | 774 | 0.50 | 0.50 | 0 | 1 | 0.62 |
| Female | 774 | 0.31 | 0.46 | 0 | 1 | 0.52 |
| Age | 774 | 31.7 | 11.7 | 15 | 79 | 24 |
| Illiterate | 774 | 0.05 | 0.22 | 0 | 1 | 0.18 |
| High school | 774 | 0.55 | 0.50 | 0 | 1 | 0.40 |
| Higher education | 774 | 0.23 | 0.42 | 0 | 1 | 0.07 |
| Protestant | 774 | 0.49 | 0.50 | 0 | 1 | 0.49 |
| Voodooist | 774 | 0.06 | 0.24 | 0 | 1 | 0.01 |
| Catholic | 774 | 0.42 | 0.49 | 0 | 1 | 0.40 |
| Access to electricity | 774 | 0.57 | 0.50 | 0 | 1 | 0.379 |
| Use Internet | 774 | 0.43 | 0.50 | 0 | 1 | |
| Own mobile phone | 774 | 0.88 | 0.33 | 0 | 1 | |

*Note:* The table reports the summary statistics of our experimental sample conducted in 2013 with the nationally representative sample of the Demographic Health Survey conducted in 2012. The means of all the reported observable characteristics are expressed in percentage with the exception of age.

experiment was performed less than 2 years after the earthquake, complicating access to the field and adding constraints on the experiment's implementation.

Figure 3 presents a map of the visited regions, with the experimental locations marked in red. Subjects were recruited from the general population by word of mouth and sessions took place in village halls and schools, not in religious buildings. When subjects arrived, they were randomly allocated numbers to ensure anonymity and all records were made with respect to their numbers. At the end of the experiment subjects completed a closed-form questionnaire, with help from project staff for illiterate respondents, and verification of each questionnaire to ensure that subjects had understood the questions.

We compare characteristics of participants with the 2012 demographic and health survey (DHS). This survey is, to the best of our knowledge, the only available nationally representative survey made in Haiti after the 2010 earthquake. Summary statistics are presented in Table 1. Our subjects are somewhat better educated than the DHS respondents but the proportions declaring themselves Catholic and Protestant are similar, with rather more of our subjects declaring themselves Voodooists, which is still a somewhat sensitive matter in Haiti.

## 4 | RESULTS: BEHAVIOUR IN THE EXPERIMENT

Table 2 reports descriptive statistics. Buying images was expensive, in that it required subjects to forgo 20% of their endowment in the trust game, yet 63.2% were willing to buy an image. Of those who bought images, 36% bought the Catholic image, 53% bought the Protestant image and 11% bought the Voodoo image.

**TABLE 2** Descriptive statistics of behaviour in the games

| Mean (SE) | All | Image buyers | Non-buyers | Cohen's d Effect size |
|---|---|---|---|---|
| Neutral game Mean (SE) | | | | |
| Token sent | 2.903 | 3.047 | 2.656 | −0.259 |
| | (1.518) | (1.389) | (1.691) | |
| Token returned (box of 6) | 2.966 | 3.129 | 2.688 | −0.217 |
| | (2.038) | (1.878) | (2.262) | |
| Token returned (box of 12) | 6.06 | 6.470 | 5.359 | −0.278 |
| | (4.065) | (3.748) | (4.478) | |
| Image game Mean (SE) | | | | |
| Token returned (box of 6) | 2.99 | 3.186 | 2.670 | −0.235 |
| | (2.204) | (2.030) | (2.443) | |
| Token returned (box of 12) | 5.879 | 6.372 | 5.035 | −0.304 |
| | (4.437) | (4.101) | (4.855) | |
| N | 774 | 489 | 285 | |

*Notes:* The table presents the summary of the bets in the games. Cohen's *d* provides the effect size based on mean comparison between buyers and non-buyers.

**TABLE 3** Characteristics of image buyers and non-buyers compared

| | Image buyers (N = 489) | Non-buyers (N = 285) | Wilcoxon significance |
|---|---|---|---|
| Rural | 56.2% | 39.3% | 0.00 |
| Female | 31.5% | 30.2% | 0.70 |
| Age | 32.1 | 30.9 | 0.34 |
| Unemployed | 15.5% | 16.5% | 0.73 |
| Illiterate | 5.5% | 4.5% | 0.56 |
| High school | 53.6% | 57.5% | 0.29 |
| Higher education | 26.0% | 21.3% | 0.14 |
| Access to electricity | 56.4% | 57.9% | 0.69 |
| Use Internet | 40.5% | 47.9% | 0.05 |
| Own mobile phone | 86.9% | 89.1% | 0.37 |

*Note:* The table reports the summary statistics of our experimental sample for buyers and non-buyers of images.

In what follows, we mainly compare the behaviour of subjects who bought images (whom we call "buyers") with that of subjects who did not, whom we call "non-buyers." Table 3 shows that in most socio-economic dimensions there was no significant difference between image buyers and others; however, there is one major exception, which is that buyers were substantially more likely to be rural residents, and one minor exception, which is that they were somewhat less likely to be internet users. In other respects (gender, employment and education), there was no significant difference between the two groups. In our estimations, we will take these imbalances into account, adding a set of individual controls.

We ask first whether buyers behaved differently from the remaining subjects in their ability to trust others and in their reciprocity towards them. The experiment reveals that they showed a greater level

of trust and greater reciprocity than other subjects. Secondly, we explore whether their payment for a religious image is related to their religious behaviour outside the context of the experiment. This is a test of the external validity of the behaviour revealed by the experiment, and of our interpretation of willingness to pay for images as revealing a greater religious commitment than that of other subjects. We show that willingness to purchase images is correlated with self-declared religion and other indicators of religious adherence.

The type of equation we estimate is:

$$C_{is} = \alpha + \beta \times \text{Buyer}_{is} + \gamma \times X_i + \delta_s + \varepsilon_{is}, \tag{1}$$

where $C_{is}$ is the choice (of amount sent or returned) of individual $i$ playing in session $s$, $\text{Buyer}_{is}$ is a dummy that takes value 1 if the player bought an image, $X_i$ denotes a vector of individual characteristics and $\delta_s$ are session fixed effects.

## 4.1 | Neutral game

Figure 4 shows the choices in the neutral game: amount sent and amounts returned by buyers and non-buyers of images. Image buyers sent 15% more to other subjects in the neutral trust game in the sender role. They returned 14% more than the non-buyers in the six-token choice and 21% more in the 12-token choice, with all three differences being significant at well under 1% according to a Wilcoxon rank-sum test. Notice that this greater trustworthiness was demonstrated *before* subjects played in the presence of religious images. We investigated whether the greater trustworthiness of buyers varies by denomination, but did not find statistically significant differences in reciprocity between those who later chose Catholic, Protestant or Voodoo images.

In Table 4 we present the estimation of Equation (1) for the three choices (one as sender and two as receiver) in the neutral game. For each of these choices, column (1) looks at the raw difference between buyers and non-buyers, showing that the difference is significant for all choices. Column (2) repeats the specification of column (1) clustering the standard errors at the session level, and the results are robust. Column (3) includes individual controls and column (4) adds session fixed effect, in addition to the other controls. The inclusion of the 33 session fixed effects involves a loss of statistical power. Yet the coefficient on image buyers is positive and significant in all specifications. This result is fairly robust.

Figure 5 shows histograms of the amounts returned, both out of six tokens received and out of 12 tokens received, comparing image buyers to non-buyers in the neutral game. The first thing to notice is that subjects were generous on average, and some were very generous indeed (this is entirely consistent with findings in the literature on trust games elsewhere).[10]

Secondly, the distribution of amounts donated shows peaks at 0%, at 50% and at 100% of the amount received. This suggests that these three peaks constitute "anchors" for the amounts that individuals choose to return to their senders.[11]

Third, as expected, given our findings about the means return values, there is a clearly visible difference between the image buyers (in dark grey) and the others (in light grey), with buyers sending

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[10]Johnson and Mislin (2011) reported a mean proportion returned of 37% in a meta-analysis of 162 published trust games.

[11]It might be considered that the peaks at zero and 100% imply that the distribution is truncated. We do not believe so, but report as a robustness check in Table A1 in the Appendix A Tobit version of Table 4, which yields qualitatively identical results.
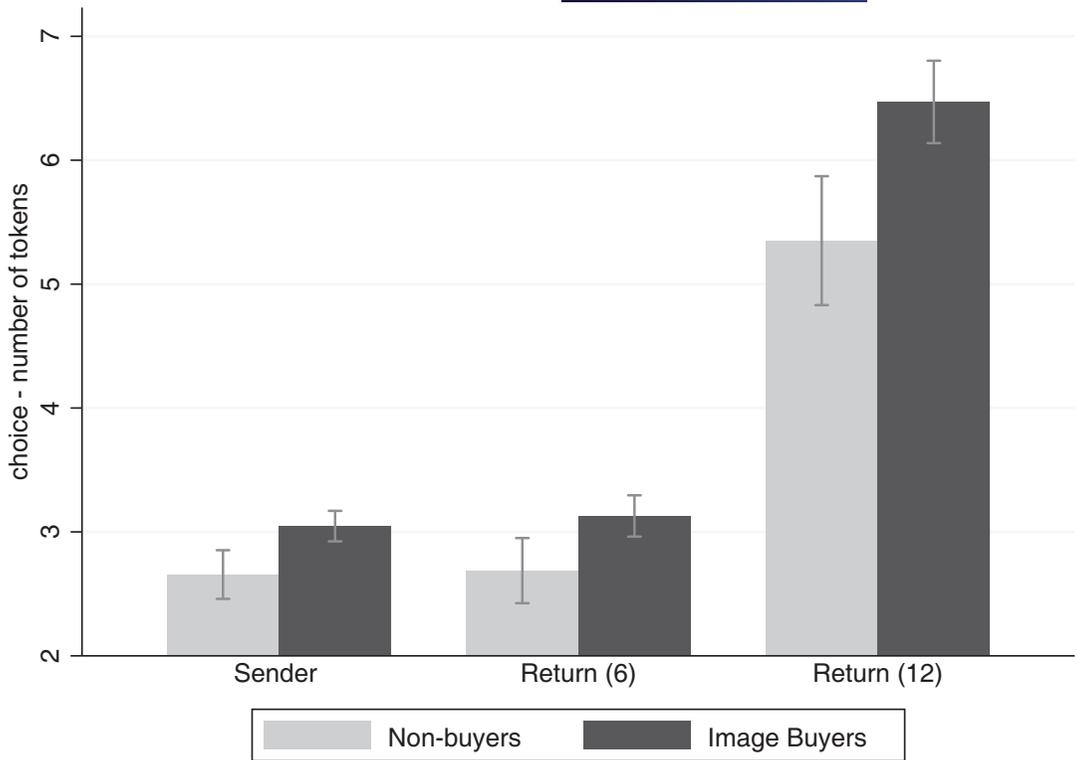
**FIGURE 4** Choices in the neutral game. Mean amounts sent and returned in the neutral trust game, in the send and the receiver role, by those who would later buy an image when playing as senders in the image treatment, compared with those who would not buy an image (all comparisons significant at less than 1% Wilcoxon rank-sum test). Error bars are 95% confidence intervals

more on average. One of the main sources of the difference is at the lower end of the distribution: buyers were much less likely than others to send nothing at all.

## 4.2 | The image game and the club good effect

In this section, we are able to use the fact that players play with images that are allocated to them at random independently of what they have chosen. We can therefore compare what happens when they play with images they prefer, as compared to playing with images they do not prefer, or with no images at all. This allows us to test some important hypotheses.

The literature on "Big Gods" to which we referred in Section 1 suggests that trustworthiness, or prosocial behaviour more generally, is a club good, in that religious adherents are more likely to behave prosocially towards members of their own religion than to outsiders.

Figure 6 shows that there is no evidence for club good effects in our experiment. Specifically, there is no difference between the trustworthiness of buyers according to whether they receive an image identical to the one they themselves have chosen, or a different image. Attachment to religious images is statistically associated with greater trustworthiness to all other actual and potential partners, not simply to members of one's own denomination.

Haiti may be unusual in the fluidity with which individuals have shifted between religious affiliations in recent years, especially since the 2012 earthquake. Anecdotal evidence during the fieldwork confirmed

**TABLE 4**  Behaviour in the neutral game

|  | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Part A: Tokens sent in the sender role |  |  |  |  |
| Image buyer | 0.3909*** | 0.3909** | 0.3536** | 0.3152** |
|  | (0.112) | (0.145) | (0.142) | (0.140) |
| Constant | 2.6561*** | 2.6561*** | 2.7504*** | 2.2012*** |
|  | (0.089) | (0.151) | (0.487) | (0.404) |
| Observations | 774 | 774 | 774 | 774 |
| $R^2$ | 0.015 | 0.015 | 0.025 | 0.169 |
| Part B: Tokens returned – box of 6 |  |  |  |  |
| Image buyer | 0.4411*** | 0.4411** | 0.4455** | 0.3135* |
|  | (0.151) | (0.204) | (0.179) | (0.159) |
| Constant | 2.6877*** | 2.6877*** | 0.2850 | 2.2915*** |
|  | (0.120) | (0.258) | (0.686) | (0.557) |
| Observations | 774 | 774 | 774 | 774 |
| $R^2$ | 0.011 | 0.011 | 0.064 | 0.237 |
| Part B: Tokens returned – box of 12 |  |  |  |  |
| Image buyer | 1.1195*** | 1.1195** | 1.2229*** | 0.9024** |
|  | (0.301) | (0.494) | (0.427) | (0.365) |
| Constant | 5.3509*** | 5.3509*** | 1.1706 | 5.7999*** |
|  | (0.239) | (0.540) | (1.415) | (1.037) |
| Observations | 774 | 774 | 774 | 774 |
| $R^2$ | 0.018 | 0.018 | 0.083 | 0.245 |
| Cluster | No | Session | Session | Session |
| Individual controls | No | No | Yes | Yes |
| Session FE | No | No | No | Yes |

*Notes:* Standard errors in parentheses, clustered when noted (33 clusters). The individual controls include the variables in Table 3 (with the square of age included).

***$p < .01$,

**$p < .05$,

*$p < .1$.

this characteristic in Haiti. During an interview with a Catholic priest, the latter said that "In good times, a Haitian is either Catholic or Protestant, and in bad times, any Haitian is a Voodooist." In addition, about 49% of our sample reports to be of Protestant faith but 50% of these were not born Protestants.

Another specificity of Haiti is that Voodoo practices were for many years subject to political repression. Voodoo was recognized as an official religion in 2003 but Voodooists still suffer from social stigma (Hurbon, 2004; Métraux, 1989).

So we would not deny that club good effects might apply in other societies, or in other contexts in this society, but we find no evidence for them here. Furthermore, our findings are consistent with those of Delavande and Zafar (2015), for madrassa students in Pakistan; the latter are more trustworthy than other subjects but not differentially towards students from other madrassas.

Table 5 presents the results of the estimation of Equation (1) for the returns of the boxes containing images. We find that image buyers consistently return greater amounts than non-buyers, and that, adding the interaction term, the effect is the same whether or not the image received in the box coincides with
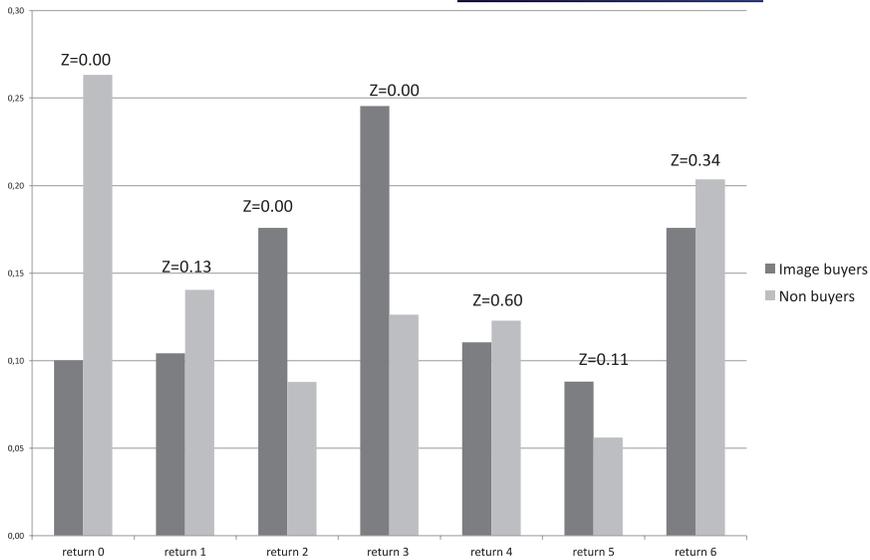
(a) Return 6
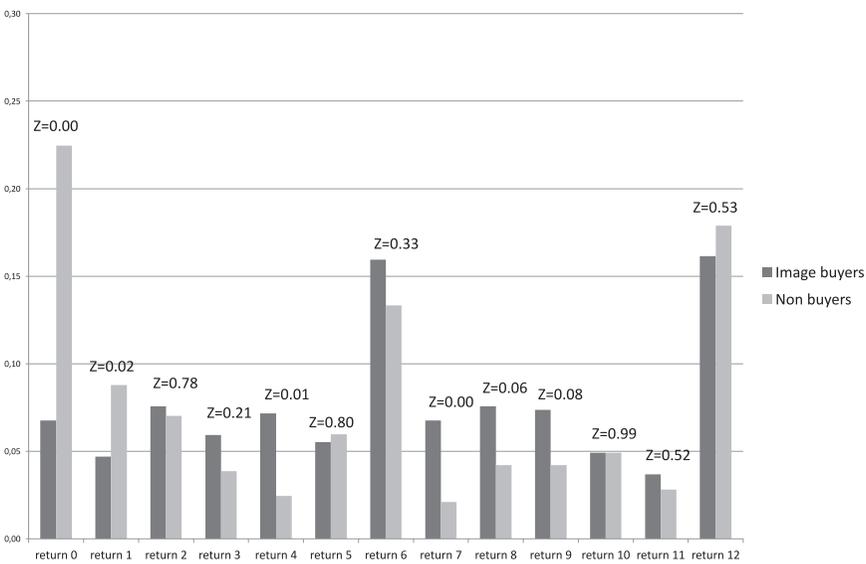


(b) Return 12

**FIGURE 5** Reciprocity of image buyers versus others – box of 6 and box of 12. Each vertical axis represents proportions of total sample in each histogram bar. Z-values represent the *p*-values of the *F*-test of the null hypothesis that proportions of respondents sending back each number were the same under both distributions

the image previously bought by the participant. In other words, it confirms that image buyers do not favour anonymous senders from their own denomination more than senders from other denominations.

Finally, we aim to check whether the presence of religious images leads our participants to behave in a more prosocial way than in the neutral setting. In Table 6 we find no difference in behaviour of our subjects when they play the trustee role with an image or without one. They send back statistically the
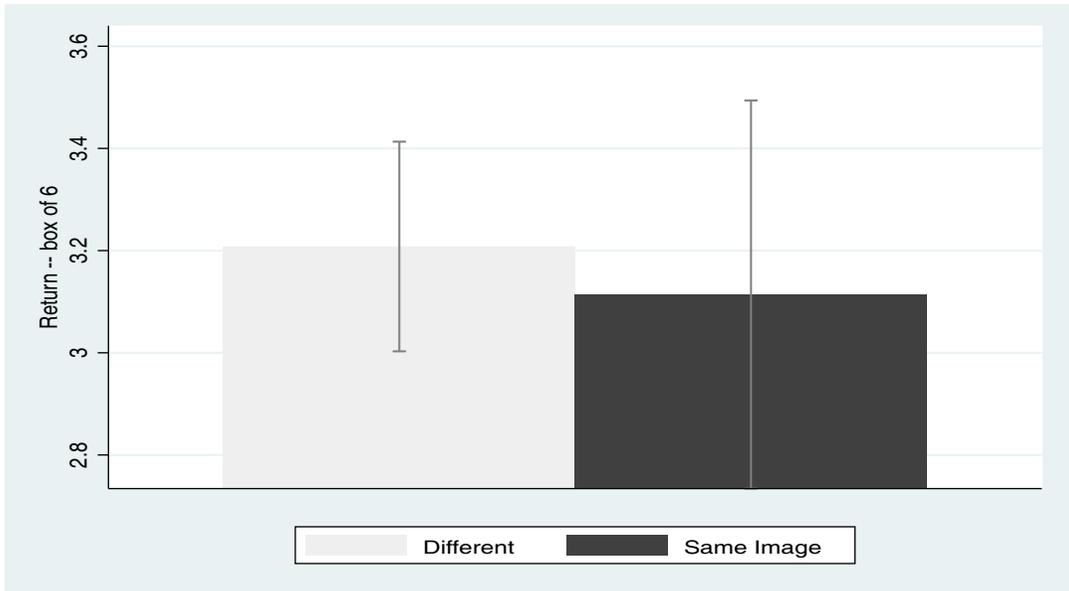
(a) Return 6
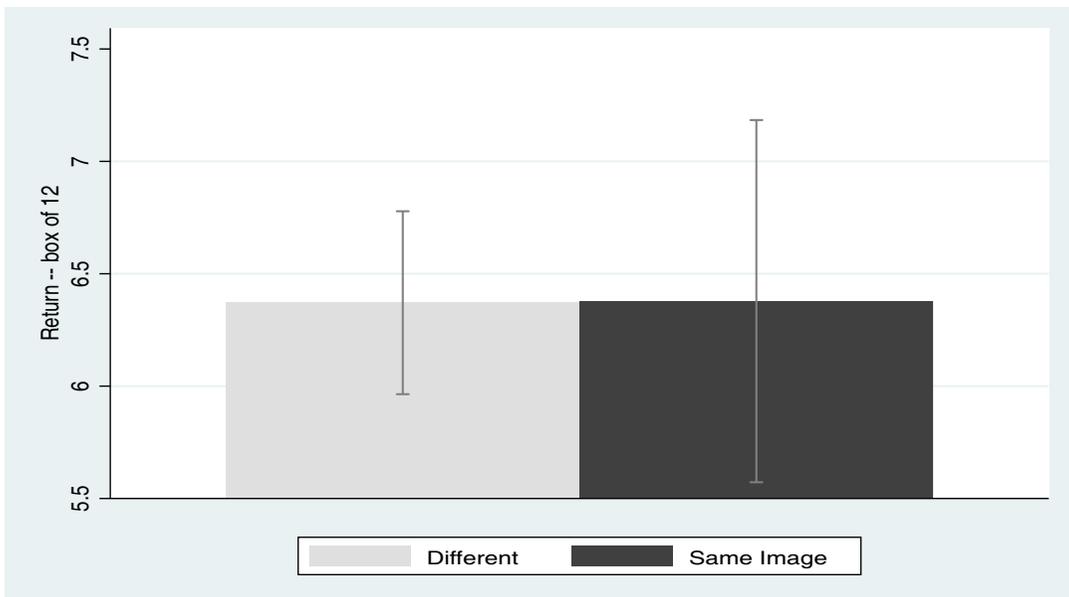


(b) Return 12

**FIGURE 6**    Behaviour of image buyers in the image game. (a) Amounts returned by image buyers when receiving a box with six tokens in the image game with the same image they had bought (114 obs.) versus a box with a different image (375 obs.). (b) Amounts returned by image buyers when receiving a box with 12 tokens in the image game with the same image they had bought (82 obs.) versus a box with a different image (407 jobs). Bars present 95% confidence intervals

same amount in the neutral and in the image treatment cases. This result is illustrated in the Appendix in Figure A1. Our subjects do not return more when they receive a religious image in addition to the experiment currency than when they receive only the currency.

**TABLE 5**  Behaviour in the image game

|  | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Part A: Tokens returned – box of 6 w/image | | | | | |
| Image buyer | 0.5159*** | 0.5378** | 0.5610*** | 0.5821*** | 0.3097* |
|  | (0.163) | (0.219) | (0.186) | (0.195) | (0.174) |
| Image buyer × Same image |  | −0.0940 |  | −0.0955 | −0.0337 |
|  |  | (0.359) |  | (0.350) | (0.308) |
| Constant | 2.6702*** | 2.6702*** | 0.2313 | 0.2261 | 2.1677*** |
|  | (0.130) | (0.279) | (0.838) | (0.840) | (0.747) |
| Observations | 774 | 774 | 774 | 774 | 774 |
| $R^2$ | 0.013 | 0.013 | 0.069 | 0.069 | 0.262 |
| Part B: Tokens returned – box of 12 w/image | | | | | |
| Image buyer | 1.3371*** | 1.3359*** | 1.3745*** | 1.3896*** | 0.9155** |
|  | (0.327) | (0.473) | (0.370) | (0.397) | (0.360) |
| Image buyer × Same image |  | 0.0070 |  | −0.0892 | −0.5542 |
|  |  | (0.633) |  | (0.521) | (0.566) |
| Constant | 5.0351*** | 5.0351*** | 0.3673 | 0.3644 | 5.6920*** |
|  | (0.260) | (0.592) | (1.712) | (1.709) | (1.245) |
| Observations | 774 | 774 | 774 | 774 | 774 |
| $R^2$ | 0.021 | 0.021 | 0.086 | 0.086 | 0.304 |
| Cluster | No | Session | Session | Session | Session |
| Individual controls | No | No | Yes | Yes | Yes |
| Session FE | No | No | No | No | Yes |

*Notes:* Standard errors in parentheses, clustered when noted (33 clusters). The individual controls include the variables in Table 3(with the square of age included). The variable *Same image* takes the value 1 when the image bought by the participant is the same as the image in the box he or she receives.

***p < .01,

**p < .05,

*p < .1.

## 5 | EXTERNAL VALIDITY: DOES BEHAVIOUR IN THE LAB PREDICT BEHAVIOUR IN THE WORLD?

A reasonable concern with the interpretation of our findings so far is the issue of external validity: how do we know that behaviour in the lab corresponds to behaviour in the real world, and specifically that willingness to pay to play with religious images indicates anything about actual levels of religious belief and practice? We undertake two types of test to investigate this question.

First, we note that the willingness to purchase images of a given denomination predicts subjects' willingness to declare themselves members of that denomination. Table 7 shows that, of those who purchased either Protestant or Catholic images, over 70% declared themselves members of that denomination compared with under 40% of those who did not purchase the image in either. The corresponding figures for purchasers of Voodoo images were around 19% and 5% respectively. All differences were significant at well under 1%.

A different way of viewing the relation between self-declared affiliation and image purchase can be seen in Figure A2 in the Appendix. Here we show the proportion of individuals buying each of the

**TABLE 6** Difference in behaviour – neutral versus image returns

| | Difference (6 tokens) | | | Difference (12 tokens) | | |
|---|---|---|---|---|---|---|
| Image buyer | 0.0102 | | −0.0404 | 0.0774 | | 0.0134 |
| | (0.134) | | (0.137) | (0.269) | | (0.278) |
| Image reported denomination | | −0.0450 | −0.2218 | | −0.1058 | −0.3278 |
| | | (0.160) | (0.192) | | (0.341) | (0.584) |
| Buyer × Denomination | | | 0.2728 | | | 0.3519 |
| | | | (0.266) | | | (0.707) |
| Constant | −0.1267 | −0.1163 | −0.0871 | −0.1642 | −0.1076 | −0.1686 |
| | (0.625) | (0.630) | (0.619) | (1.221) | (1.185) | (1.240) |
| Observations | 774 | 774 | 774 | 774 | 774 | 774 |
| $R^2$ | 0.082 | 0.082 | 0.083 | 0.104 | 0.104 | 0.105 |
| Cluster | Session | Session | Session | Session | Session | Session |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Session FE | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* Standard errors in parentheses, clustered when noted (33 clusters).

The individual controls include the variables in Table 3 (with the square of age included). The dependent variable is the difference in amounts returned in the neutral versus the image games. For columns (1) to (3), the difference is from the returns in the boxes with six tokens, while columns (4) to (6) look at the differences in the returns for the boxes with 12 tokens.

The variable *Image reported denomination* is a dummy that takes value 1 if the image received box was from the denomination declared as the participant's religious affiliation in the post-experiment questionnaire.

***$p < .01$,

**$p < .05$,

*$p < .1$.

three image types, separately for those who declared themselves Catholics, Protestants and Voodoists. A far greater proportion of declared adherents than non-adherents purchased the image in question. Once again the differences are significant at a tiny fraction of 1%.

It might be argued that self-declared religious affiliation is potentially just cheap talk, and that subjects might have tended to declare religious affiliations to be coherent with actions they had already undertaken in the experiment. We therefore also undertook a more systematic and in-depth investigation of subjects' religious belief and practice. In our questionnaires we asked subjects 24 questions about whether they engaged in various practices that tend to be associated with different aspects of religiosity (see Appendix C for details).

Some of these are likely to indicate a general tendency to religiosity (an example being "Do you clean the tomb of a deceased person every year?"), while others are likely to be indicative of more specific commitments, such as to Voodoo (an example being "Do you do any of the following things to protect your child against harmful magic?"). While the answers to these questions are no less cheap talk than the answers to our questions about religious affiliation, the type of religious practice they reveal should be a valuable check on the coherence of the declarations of religious affiliation. We then took the first three principal components of these 24 answers and investigated their relationship to self-reported religion.

Table 8 shows the correlation between the three principal components and subjects' self-reported affiliation. The first principal component of religiosity is highly correlated with the three self-reported religious affiliations, especially (negatively) for Protestants and to a less extent (positively) for Catholics and Voodooists.[12] Table A2 in the Appendix tests these associations rigorously with con-

[12]The second principal component of religiosity is also correlated with the self-reported religious affiliations but to a lower extent.

**TABLE 7** Proportions declaring religious affiliation by image bought

|  | Obs. Image buyers | prop. of Image buyers declaring the corresponding religion | Obs. non-buyers of the image | prop. of Non-buyers of the image declaring the corresponding religion | p-values |
|---|---|---|---|---|---|
| Voodooist | 53 | 18.9% | 721 | 5.13% | .000 |
| Protestant | 261 | 74.3% | 513 | 36.6% | .000 |
| Catholic | 175 | 73.1% | 599 | 32.9% | .000 |

*Note:* The table reports the number of observations and proportions, of buyers and non-buyers of a given image, respectively, whose declared religious affiliation in the post-experiment questionnaire corresponded to the image in question. In each case, far more x buyers of a image than non-buyers of this image reported a corresponding affiliation, and the Wilcoxon rank-sum test of the difference in proportions is significant in each case at less than one hundredth of 1%.

**TABLE 8** Correlation matrix of principal components of religiosity with self-reported religious affiliation

|  | Protestant | Catholic | Voodoo |
|---|---|---|---|
| First principal component of religiosity | −0.620 | 0.445 | 0.378 |
| Second principal component of religiosity | −0.278 | 0.383 | −0.199 |
| Third principal component of religiosity | 0.051 | −0.009 | −0.114 |

*Note:* The table presents the correlations between the declared religious affiliation in the post-experimental questionnaire, and the first (second and third) principal components of religiosity, calculated from the answers to the questions related to religious practices (24 questions).

trols, and shows that the first principal component of religiosity has a strong predictive value: negative for buying a Protestant image and positive for buying a Catholic image and a Voodoo image. The opposite signs do not come as a surprise; in Haiti, there is a substantial shared imagery between the Catholic and Voodoo traditions, and Voodoo ceremonies have many echoes of Catholic masses. The Protestant tradition appears relatively more as a challenge to both traditions, especially to Voodoo.

Finally, we conduct a preliminary test of whether religious behaviour conveys an economic advantage to subjects by investigating whether our three principal components of religiosity, as well as the subjects' reciprocity in the trust game, predict subjects' participation in local borrowing and lending networks. Recall that financial institutions are very underdeveloped in Haiti, and much borrowing and lending takes place at small scales between friends, neighbours and family members, which raises major challenges of trustworthiness.

We asked subjects to tell us whether they participated in borrowing from and/or lending to other people. These people could include neighbours, family members, personal friends and others. We constructed a first principal component of their yes/no answers for these four categories concerning borrowing and lending respectively. This is only suggestive evidence: ideally we would have obtained detailed quantitative evidence about respondents' economic activities, but this was not feasible.

Table A3 in the Appendix shows that there is a positive association between our components of religiosity and participation in both borrowing and lending (though for the first component the association is not statistically significant). Interestingly, there is also an independent positive association with reciprocity (as measured by the amount returned out of 12 in the neutral trust game) independently of religiosity. This is stronger for borrowing than for lending, as one might expect as it is borrowers who have the greater need to be considered trustworthy. This suggests that religiosity may serve to convey some indication of trustworthiness, but the

imperfect association of religiosity with intrinsically prosocial behaviour suggests that those individuals who really are more trustworthy need, and may be able to find, other reliable signals of their good character. Their willingness to accept significant real costs to purchase religious images may be seen as one of many ways, individually no doubt insignificant but collectively quite important, in which the more trustworthy members of this very suspicious society succeed in signalling their characteristics to others.

# 6 | DISCUSSION

The results of our experiment suggest that people who are more religious are also more trustworthy: our image buyers return significantly more on average than non-buyers. Moreover, our experimental results do not show any club good effect: image buyers send on average the same amount to co-religionists and to other players. Finally, we do not find significant effects of the presence of religious images on reciprocity: our subjects' return choices are statistically the same whether they play receivers in the presence of a religious image or in the neutral case. In other words, greater religiosity is associated with the more reliable character of adherents, who behave more prosocially in our experiment, although there is no direct interaction between subjects.

Although the literature on "Big Gods" suggests that the principal explanation for any correlation between religious adherence and prosocial behaviour is by making subjects believe that their behaviour is being supernaturally observed, in our case we do not find that the presence of religious images affects reciprocity. Our evidence suggests that image buyers are more reliable independently of the context.[13] They give more in all circumstances (with and without images) and to all types of players (fellow adherents and to the general population). Their greater reciprocity also appears to be correlated with greater participation in borrowing and lending networks. Our experimental findings are therefore consistent with costly religious adherence helping to distinguish more from less intrinsically trustworthy individuals. It says nothing about why they are more trustworthy. It may be that they fear more retaliation from Big Gods, that they are more willing to respect social norms (Fehr et al., 2002), that they differ in the degree of utility they derive from what happens to others (Becker, 1974) or that they have stronger self-image concerns (Bénabou & Tirole, 2006; Brekke et al., 2003). Exploring these various causal mechanisms is something we leave for further research.

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[13]This does not rule out the possibility that religion has increased the trustworthiness of its participants over time; it may be that the influence of religion has gradually increased their trustworthiness, but if so, it is in a manner that is not significantly affected by the presence of religious cues in their interactive environment.

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**APPENDIX A**
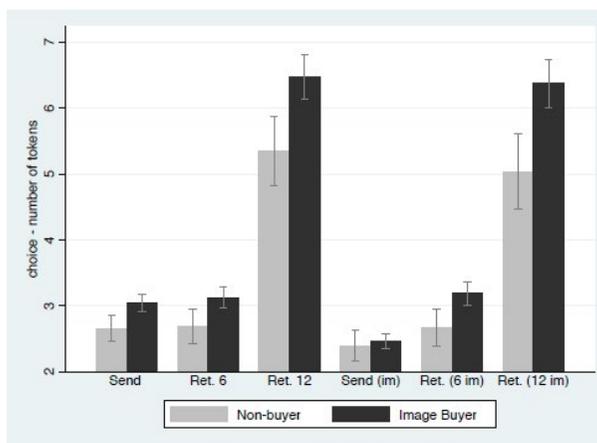


**FIGURE A1**    Average amounts sent and returned in the neutral case (left side) and image treatment (right side). *Note:* Each vertical axis represents average amounts in each histogram bar. Error bars are 95% confidence intervals
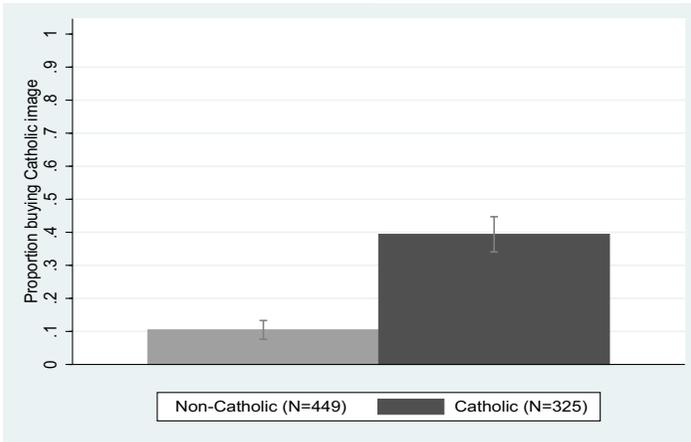
(a) Catholic Image buyer
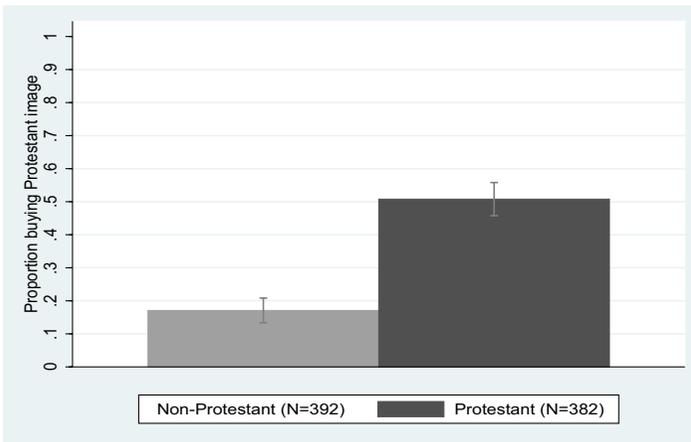
(b) Protestant Image buyer
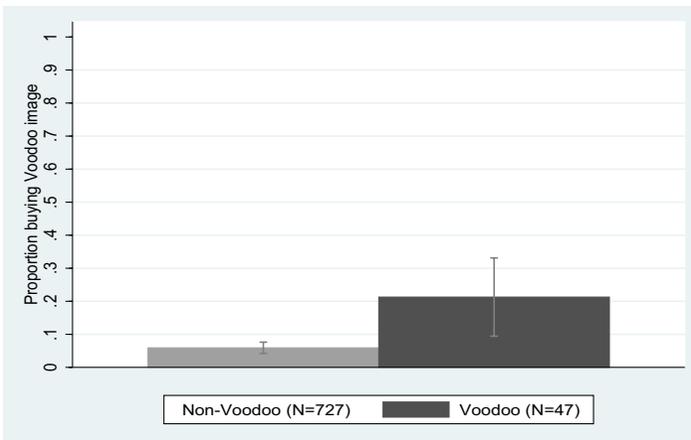
(c) Voodoo Image buyer

**FIGURE A2** Proportions who bought each image, by whether or not they declared adherence to that denomination

**TABLE A1** Behaviour in the neutral game – Tobit robustness

| | (1) | (2) | (3) |
|---|---|---|---|
| Part A: Tokens sent in the sender role | | | |
| Image buyer | 0.3909*** | 0.3536*** | 0.3152*** |
| | (0.112) | (0.114) | (0.111) |
| Constant | 2.6561*** | 2.7504*** | 2.6541*** |
| | (0.089) | (0.477) | (0.548) |
| Observations | 774 | 774 | 774 |
| Part B: Tokens returned – box of 6 | | | |
| Image buyer | 0.4411*** | 0.4455*** | 0.3135** |
| | (0.151) | (0.150) | (0.143) |
| Constant | 2.6877*** | 0.2850 | 2.0480*** |
| | (0.120) | (0.627) | (0.705) |
| Observations | 774 | 774 | 774 |
| Part C: Tokens returned – box of 12 | | | |
| Image buyer | 1.1195*** | 1.2229*** | 0.9024*** |
| | (0.300) | (0.295) | (0.284) |
| Constant | 5.3509*** | 1.1706 | 5.5287*** |
| | (0.239) | (1.238) | (1.399) |
| Observations | 774 | 774 | 774 |
| Individual controls | No | Yes | Yes |
| Session FE | No | No | Yes |

*Notes:* Standard errors in parentheses.

The individual controls include the variables in Table ,3 (with the square of age included).

***$p < .01$,

**$p < .05$,

*$p < .1$.

**TABLE A2** Predicting image buying based on principal components of religiosity

|  | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
|  | **Protestant** | **Image buyer** | **Catholic** | **Image buyer** | **Voodoo** | **Image buyer** |
| First principal component of religiosity | −0.0650*** (0.011) |  | 0.0383*** (0.011) |  | 0.0314*** (0.007) |  |
| Second principal component of religiosity |  | −0.0437*** (0.014) |  | 0.0592*** (0.014) |  | 0.0044 (0.012) |
| Constant | 0.2813** (0.129) | 0.2139* (0.126) | 0.3049** (0.143) | 0.3968*** (0.139) | 0.2706*** (0.069) | 0.2772*** (0.074) |
| Observations | 774 | 774 | 774 | 774 | 774 | 774 |
| R2 | 0.144 | 0.110 | 0.131 | 0.141 | 0.119 | 0.082 |
| Cluster | Session | Session | Session | Session | Session | Session |
| Individual controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Session FE | Yes | Yes | Yes | Yes | Yes | Yes |

*Notes:* Standard errors in parentheses, clustered when specified (33 clusters). The dependent variable is a dummy indicating whether a participant bought an image of a given religious denomination. The independent variable, first (second) principal component of religiosity, is calculated with the answers to the questions related to religious practices (24 questions). The individual controls include the variables in Table 3 (with the square of age included). Results are robust when no controls are accounted for. The third first principal component of religiosity is omitted as it has no predictive values on the propensity to buying an image of a given religious denomination.

***$p < .01$,

**$p < .05$,

*$p < .1$.

**TABLE A3** The influence of religiosity and reciprocity on local borrowing and lending

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | | | | **1st PC** |
| | **1st PC Borrow** | **1st PC Borrow** | **1st PC Lend** | **Lend** |
| First PC of religiosity | 0.0354 | 0.0384 | 0.0307 | 0.0348 |
| | (1.48) | (1.63) | (1.29) | (1.37) |
| Second PC of religiosity | 0.112*** | 0.0993*** | 0.125*** | 0.111*** |
| | (3.98) | (3.65) | (3.89) | (3.22) |
| Third PC of religiosity | 0.0867*** | 0.0903*** | 0.0909*** | 0.0951*** |
| | (3.19) | (3.22) | (3.00) | (3.03) |
| Returned out of 12 | 0.0308*** | 0.0200* | 0.0208* | 0.00754 |
| | (2.81) | (1.90) | (2.02) | (0.75) |
| Constant | −0.189* | −0.962* | −0.126 | −1.293* |
| | (−2.10) | (−3.45) | (−1.19) | (−3.34) |
| Observations | 774 | 774 | 774 | 774 |
| $R^2$ | 0.046 | 0.095 | 0.040 | 0.076 |
| Cluster | Session | Session | Session | Session |
| Individual controls | No | Yes | No | Yes |
| Session FE | No | No | No | No |

*Note: t* statistics in parentheses. The individual controls include the variables in Table 3 (with the square of age included).

*$^*p < .10$,

*$^{**}p < .05$,

*$^{***}p < .01$

# APPENDIX B.

**Experimental Protocol**

## B.1 | Introduction

### Room preparation

Before the start of the experiment, 25 seats are arranged in the experiment room. Whenever possible, all experimental materials are kept in a nearby room out of the view of the participants. Where that is not feasible, materials are hidden at the end of the room out of the participants' sight.

Once the participants enter the room, they are seated. All the explanations of the experiment director are in Kreyol.

### Introduction

Experiment director (ED afterwards): Thank you for coming. We are a group of university researchers from Toulouse, in France and Quisqueya University. We thank you for coming to this session. Please let us start by giving you very important information for the game.

In a flip chart that will be in view of the participants during the whole game, the experiment director proceeds to write each of the rules: anonymity, secrecy and serious thought. In the meantime, the assistants distribute the ID numbers.

ED: The first rule we will follow is Anonymity. No personal information will be revealed. You are now given a number in your ID tag; please attach it to your t-shirt. We will never ask you your name; all your decisions will be recorded only with this number. The second important rule is Secrecy. Since all decisions are private, nobody should try to look at anyone else's choices. And the third norm is Serious thought (ŕefĺechi). You need to think seriously about your choices, as real money is involved. You have the possibility of making money, and how much you actually earn depends on your decisions.

The first set of experiment coins is distributed (for the first game) together with the box/cup corresponding to this game to make it easier for the experiment director to explain the value of the experimental coins.

ED: You have some plastic coins in your hand, right? You should know that 1 coin = 1 point and 1 point = 2 gourdes (it is written here on the flip chart).14 Then, it is important for you to think about all decisions since that will affect the payments received at the end of the game. Clear for everybody? Any questions?

Then, let us proceed if that is clear for everyone. You are allowed to leave the room at any time you may wish to; this is a voluntary activity. If you leave before the end of the session, we will not be able to calculate your payments.

## Games included in the experimental session

The experimental session consists of two games, a lottery and a trust game. The images used in both games are the same for comparability. The structure of each of the games is similar: first a 'neutral' game is played, and afterwards the game is re-played after the introduction of the images. We present in this paper the results from the trust game.

## B.2 | Neutral trust game

Participants are distributed an empty 'take away' box and five tokens.

## Senders

ED: Let us start with the first (second) game. You are receiving a box and 5 tokens. Please count the tokens. How many do you have? Does everyone have 5 tokens? Perfect! Then let me remind you (showing the flip chart) the value of the tokens: 1 token is 1 point, and each point is worth 2 gourdes. Also, let me remind you that all we do here is anonymous: that is why boxes have a number; that is, the same number that you have attached to your t-shirt.

ED: Ok. Then let me explain you what happens with this box. All the tokens you do not put in the box are yours to keep. Hence, if you do not put anything, you have $5 \times 2 = 10$ gourdes. The tokens you put in the box will be multiplied by 3, and then the box will be sent to someone in this 'commune'. The person in the commune that receives the box will decide how many tokens to take and how many to return to you. Clear? Now you can now decide how many tokens to put inside the box, and how many to keep for yourself.

ED: Thank you. Now the experiment assistants will collect the boxes and the tokens.

## Recipients

Next, participants are distributed a closed box. Time constraints made it unfeasible to use the complete strategy method for player B (which would have required playing 24 times, six times for each image plus six times without an image), so instead we made player's B strategy to return boxes with 6 and 12 tokens.

ED: Now you have a closed box. Please open it. How many tokens are there? This box comes from someone in the commune that played this game and is sending you this amount of tokens. Your choice is how many of them to keep for yourself, and how many to send back to the person that sent them. Clear? Now take out of the box the tokens you want to keep and close it. My assistants will come to collect the materials.

## B.3 | Trust game with images

For the second trust game, empty boxes and 5 tokens are distributed to the participants as for the neutral game.

## Senders

ED: Thank you for your patience. Now, you have once more a box and 5 tokens, right? Perfect. Let me explain what is different now. At the price of 1 token, you can get one of these three images to put inside the box you are sending to another person in the commune whose identity you do not know, and he/she will never know yours. The game is exactly as before: every token you put in the box will be multiplied by 3.

ED: How can you get an image? My assistants will come close to you with these boxes, with a cover so that the neighbour cannot see your choice. In the box there are the 3 images, and white cards. As you can see, there is one with an image that you will recognize from the Voodoo tradition, an image of the Sacred Heart of Jesus, a picture of the song book "chants d'esp´erance" that most Protestant churches use. Does everyone see them?

ED: If you want to get an image, you need to put one token in the box and get it. If you do not want to buy an image, you put no token in the box and you take out a white card. In the box there are already some tokens, so it is impossible for anyone to know what their neighbour has done. Clear for everyone? Great. Then my assistants are passing with the boxes.

## Recipients

For player B, participants are given two return boxes, with 6 and 12 tokens respectively and with an image. The explanation is the same as in the neutral game, making no reminder of the presence of the image not to make the image artificially salient.

## Questionnaire on religious practices

Note that the number in parenthesis refers to the number of the given question in the original questionnaire.

## Bloc 1: Voodoo religious practice

1. (Q15) At the last birth of a child in your family, what medical care did you have?
   - Hospital or clinic
   - Doctor or nurse
   - Midwife
   - Traditional doctor ("levepye") ⇒ A dummy variable takes the value 1 for those who give this reply.

2. (Q17) What did you do to protect the child against jalousie, Djok, Lougawou?
   - Prayer
   - Bath ⇒ A dummy variable takes the value 1 for those who give this reply.
   - Mystical object (collier, centure de Djok, ...)

3. (Q17) What did you do to protect the child against jalousie, Djok, Lougawou?
   - Prayer
   - Bath
   - Mystical object (collier, centure de Djok, ...) ⇒ A dummy variable takes the value 1 for those who give this reply.

4. (Q18) In your opinion, what was the cause of the death of the last close person you lost?
   - Natural
   - Supernatural ⇒ A dummy variable takes the value 1 for those who give this reply.

5. (Q19) Which ceremonies did you perform for that person?
   - Measuring the body ("retemo") ⇒ A dummy variable takes the value 1 for those who give this reply.
   - Vigil ("veill´ée")
   - Funeral
   - Last prayers

6. (Q31) Concerning the last case of serious illness in your family, what was the cause of that sickness?
   - Natural
   - Supernatural ⇒ A dummy variable takes the value 1 for those who give this reply.

7. (Q33) Where did you go with this person for medical care?
   - Hospital or clinic
   - Church
   - Doctor or nurse
   - Traditional doctor ("levepye") ⇒ A dummy variable takes the value 1 for those who give this reply.

8. (Q34) What measures did you take to protect this person against future sickness?
   - None
   - Modern medicine
   - Traditional medicine
   - Both ⇒ A dummy variable takes the value 1 for those who give this reply or "Traditional Medicine"

9. (Q37) If you or a member of your family has been the victim of physical violence, to whom did you go for help?
   - Nobody
   - Police, lawyer, state authority
   - Family, friends
   - Priest or Pastor
   - Traditional Practitioner ⇒ A dummy variable takes the value 1 for those who give this reply.

10. (Q45) In which type of ceremonies do you participate in your village?
    - Protestant church
    - Catholic church
    - Fˆete patronale
    - Guede (voodoo dance and ceremonies) ⇒ A dummy variable takes the value 1 for those who give this reply.

11. (Q40) If you or a member of your family has been the victim of theft, to whom did you go for help ?
    - Nobody
    - Police, lawyer, state authority
    - Family, friends
    - Priest or Pastor
    - Traditional Practitioner ⇒ A dummy variable takes the value 1 for those who give this reply.

## Bloc 2: General religiosity

1. (Q17) What did you do to protect the last child born in your family child against jalousie, Djok, Lougawou?
   - Prayer ⇒ A dummy variable takes the value 1 for those who give this reply.
   - Bath
   - Mystical object (collier, centure de Djok, ...)

2. (Q19) Which ceremonies did you perform for the last close person you lost?
   - Measuring the body ("retemo")
   - Vigil ("veill´ée") ⇒ A dummy variable takes the value 1 for those who give this reply.

- Funeral
- Last prayers

3. (Q19) Which ceremonies did you perform for the last close person you lost?
   - Measuring the body ("retemo")
   - Vigil ("veill´iée")
   - Funeral ⇒ A dummy variable takes the value 1 for those who give this reply.
   - Last prayers

4. (Q19) Which ceremonies did you perform for the last close person you lost?
   - Measuring the body ("retemo")
   - Vigil ("veill´ee")
   - Funeral
   - Last prayers ⇒ A dummy variable takes the value 1 for those who give this reply.

5. (Q20) Do you clean the tomb of the deceased person every year?
   - Yes ⇒ A dummy variable takes the value 1 for those who give this reply.
   - No

6. (Q33) Where did you take the last person with a serious illness for medical care?
   - Hospital or clinic
   - Church ⇒ A dummy variable takes the value 1 for those who give this reply.
   - Doctor or nurse
   - Traditional doctor ("levepye")

7. (Q37) If you or a member of your family has been the victim of physical violence, to whom did you go for help?
   - Nobody
   - Police, lawyer, state authority
   - Family, friends
   - Priest or Pastor ⇒ A dummy variable takes the value 1 for those who give this reply.
   - Traditional Practitioner

8. (Q23) Do you take into account the moon when you plant crops?
   - Yes ⇒ A dummy variable takes the value 1 for those who give this reply.
   - No

9. (Q45) In which type of ceremonies do you participate in your village?
   - Protestant church ⇒ A dummy variable takes the value 1 for those who give this reply.
   - Catholic church
   - Fête patronale
   - Guede (voodoo dance and ceremonies)

10. (Q45) In which type of ceremonies do you participate in your village?
    - Protestant church
    - Catholic church ⇒ A dummy variable takes the value 1 for those who give this reply.
    - Fê^te patronale

- Guede (voodoo dance and ceremonies)

11. (Q44) In which type of social organization do you participate in your village?
    - Religious organization ⇒ A dummy variable takes the value 1 for those who give this reply.
    - Political organization
    - Cooperative
    - Rotating savings and credit association

12. (Q30) What measures do you take to protect your business activities from theft?
    - None
    - Lucky objects
    - Prayer ⇒ A dummy variable takes the value 1 for those who give this reply.

13. (Q40 If you or a member of your family has been the victim of theft, to whom did you go for help?
    - Nobody
    - Police, lawyer, state authority
    - Family, friends
    - Priest or Pastor ⇒ A dummy variable takes the value 1 for those who give this reply.
    - Traditional Practitioner