# Religious Outgroup Prosociality and the Influence of Political Stability Across 61 Countries and 105 Religious Denominations

Thesis Submitted in Partial Completion of PB310: Independent Research Project during BSc in Psychological and Behavioural Science

Awarded First-Class and Best Performance award (joint)

## Abstract

Religious affiliation is seen to facilitate large-scale, anonymous cooperation among coreligionists. However it is unclear if this expanded prosociality scales to members of religious denominations different from one's own or instead fuels intergroup conflict. It is also unclear whether this effect would be influenced by environmental conditions of uncertainty including political instability. The current study analyzed 77,419 participants across 61 countries and 105 religious denominations using secondary data synthesized from the World Values Survey, the World Bank, and Freedom House spanning 2017 to 2022. Regression and multi-level analyses demonstrated that religious membership was associated with increased trust in members of religious outgroups compared to individuals who did not identify with a religion, even when controlling for relevant confounds. The effect of religious membership on trust was strengthened as an individual's degree of religiosity increased. Further, political stability exhibited a positive moderation effect on the relationship between religiosity and trust that was only significant at moderate to high levels of political stability. Independent of religious affiliation, political stability also showed a positive effect on trust; however, this effect was negative and not significant when controlling for confounds. This study offers the first direct demonstration that religiously enabled trust scales to members of religious outgroups, increases with religiosity, but is bounded by politically unstable environments. The results provide robust cross-cultural evidence for cultural group selection theory and suggests that religious diversity does not necessarily lead to intergroup conflict. Instead, religious affiliation can be used to form social cohesion even under conditions of moderate political stability, particularly in demographically diverse communities.


*Keywords:* Cooperation, trust, religion, intergroup relations, psychology, political stability, cultural group selection, cross-cultural research, secondary data

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# Introduction

## Research Problem and Significance

This Independent Research Project examines if the prosocial effects of religious affiliation – specifically an individual's willingness to trust others – extend to members of religious denominations different from one's own (religious outgroups). Further, it also seeks to understand whether the relationship between religiosity and trust is influenced by environmental conditions of uncertainty in the form of political instability.

This study is important because existing literature has shown that religions serve a significant role in enabling large-scale cooperation by, for example, increasing fairness in social exchange, decreasing in-group tribal competition, and reducing rule-breaking behaviors that particularly benefit individuals who share similar beliefs (Ibrahim, 2011; Norenzayan et al., 2014; Purzycki et al., 2016). However, it remains unclear if this expanded cooperation scales to members of religious groups different from one's own, and if so, whether the effect is influenced by instability in the environment. This study, therefore, aims to fill these two gaps in the literature that are key from both theoretical and practical perspectives. From a theoretical perspective, understanding the extent religious members trust individuals from religious outgroups illuminates the functional purposes of religion from an evolutionary perspective: more specifically, the study provides a cross-cultural test of cultural group selection theory that underpins the evolution of cooperative behavior (this theory will be explicated in the following paragraphs). Indeed in 2005, *Science* listed the origins of cooperative behavior among one of its top 25 questions for the coming century (Pennisi, 2005). From a practical perspective, this research offers insight into how and why cooperation might be established between groups such as nation states, the degree to which cooperation and communal stability is manifested in religiously diverse societies, and whether a proclivity towards cooperative behavior may be influenced by background

uncertainty in the form of political instability, elucidating the role of societal-level context on individual-level outcomes. Given the novelty of this research domain, there is limited availability of measures used to assess cooperation towards religious outgroup members. Therefore, this study utilizes trust as a proxy for cooperation based on cross-cultural meta-analytic evidence indicating a positive relationship between the two constructs and theory suggesting that trust enables cooperation, especially in large-scale societies (Balliet & Van Lange, 2013; Kuipers, 2022).

**Theoretical Foundations: Critical Analysis of Existing Research and Gaps**

This study draws on the theoretical paradigm of cultural group selection. Cultural group selection (CGS) is a model that has been used to explain the evolutionary origins of large-scale cooperative behavior characteristic of human populations. Broadly, CGS has been applied to cooperative behavior because of the unique nature of human sociality that other theories could not fully explain. We engage in complex market exchanges, peacefully attend sporting events, and donate our organs to those we have never met. However, this sociality raises a unique challenge to our understanding of human behavior by opposing theories of behavior underpinned by self-interest that are commonplace across the social and biological sciences. For example, standard economic theory posits that individuals are utility maximising agents solely interested in increasing individual utility in the form of satisfaction derived from consumption (*Principles of Economics*, 2016). Similarly, evolutionary biology establishes the notion of fitness whereby individuals seek to maximize reproductive advantage and therefore, will only act prosocially towards kin or in situations where reciprocity can be expected – in both cases, the costs of prosocial behavior are offset (Okasha, 2020). However, humans frequently behave in ways incongruent with this individual utility- and fitness-maximising axiom. Instead, our prosocial behavior extends beyond kin and reciprocal interactions to cooperation on large-scale, anonymous societies

where genetic relatedness decreases and opportunities for reciprocity fall (Boyd & Richerson, 1988). This raises a challenge to conventional models of cooperation because large-scale, anonymous cooperation exacerbates the potential for freeriding to occur, whereby individuals who detract from cooperation can reap the benefits obtained from those who do cooperate without expending any of the costs. Thus, CGS attempts to provide a framework capable of explaining this unique prosociality. Under CGS, cultural groups comprised of cultural traits compete with one another; overtime, the cultural traits that benefit group success the most are culturally transmitted and sustained (Richerson et al., 2016). In this way, CGS extends the principles of natural selection to cultural groups by suggesting that selection does not require genes to operate. Instead, selection only requires 1) variation, 2) transmission, and 3) selection: this criteria can be met in systems beyond genes. Cultural groups compete with one another, and prosocial behaviors have evolved to benefit group success in the context of intergroup competition. These two principles of CGS – intergroup competition and evolved prosocial behavior within groups that confer group success – underpins this research project.

CGS is intricately associated with social norms and institutions in that CGS gives rise to norms and institutions that confer group-level benefits, including religion. Religion, operationalized in this study as the general belief in a supernatural god, is a human universal that extends into anthropological history and permeates across cultural products, ranging from language to ritual (Richerson et al., 2016). As outlined above, investigations into the evolutionary foundations of religion have demonstrated that religious affiliation positively correlates with prosocial outcomes – this evidence appears robust cross-culturally (Wilson, 2002). Religion has been utilized as an indicative example of CGS as it is seen as an evolved cultural institution (groups of cultural traits) that facilitates large-scale, anonymous cooperation by stipulating a supernatural god's ability to punish individuals who do not cooperate (Purzycki et al., 2016). In turn, cooperation facilitates greater success in intergroup

competition which further perpetuates religion itself. Moreover, like other cultural products, religion is made possible by a repertoire of proximate psychological mechanisms that are consistent with theories of cultural learning. For example, the human tendency for conformist social learning (copying locally common behaviors), punishment of norm violators, and cognitive capacities for mentalising (representing others in the mind) all facilitate the transmission and stabilization of the cultural traits that comprise religious groups (Richardson et al., 2016).

The existing literature, however, has not examined the degree to which the prosocial effects of religion extend to individuals outside of a particular religious denomination. As stated by Purzycki et al. (2018), it remains unknown whether "the expanded cooperation enabled by religious elements may still be bounded … [and if it] may turn toxic towards religious outgroups, fuelling intolerance and violence, [when real or imagined conflict is already present]". This study aims to fill this gap which has important implications for CGS. Precisely, it discerns the boundaries of cultural groups in CGS. If religious members are less willing to trust members of religious outgroups than non-religious individuals, then it is likely that individual religious denominations are in themselves cultural groups. However, if religious members are more willing to trust members of religious outgroups, then it is possible that religion itself is an overarching cultural group. Indeed, White, Muthukrishna, and Norenzyan (2021) have shown that religions share overlapping cultural traits despite differences in religious denomination, suggesting that intergroup conflict is not necessarily caused by differences in culture but instead other factors such as feelings of group identity. Therefore, CGS underpins this research project by supplying the prediction that a religious individual's willingness to trust will extend to religious outgroup members to the extent that the cultural boundaries between the religious groups overlap. In other words, religions comprise similar cultural traits independent of the specific denomination.

This study also examines how background uncertainty of high-risk environments in the form of political instability influences the willingness to trust. Extant literature has assessed political stability in several ways, including by the absence of violence, the lack of structural change, the presence of a genuine constitutional regime, and an enduring government (Hurwitz, 1973). Despite the challenges in operationalization, the lack of political stability has been linked with negative societal-level outcomes including lower growth rates of GDP per capita, decreased trust in government, and lower educational quality independent of economic conditions (Aisen & Veiga, 2013; Martin et al., 2022; Nir & Kafle, 2013). However, there is less research on how political instability influences individual-level outcomes, including an individual's willingness for trust and cooperate (Purzycki et al., 2018). According to risk homeostasis theory, rather than to minimise risk, individuals seek to optimise risk by moderating their behavior according to the perceived level of risk (Wilde, 1998). When the perceived level of risk is low relative to the level at which the risk is expected to yield maximal net benefit (target level of risk), individuals are likely to be more risk-seeking and act more incautiously. As cooperation is a risky behavior for an individual, it is possible that individuals are less willing to cooperate with members of religious outgroups when risk is already high in their immediate environment. Therefore, political stability may demonstrate a positive effect on the relationship between religiosity and trust, and by corollary, cooperation. This study seeks to fill this gap that can illustrate how environmental and societal-level influences of risk affect individual-level outcomes including prosociality. From an empirical perspective, this could be especially important for regions experiencing high levels of uncertainty, including the Middle East and North Africa (MENA) regions. For example, despite the severe intergroup conflicts, authoritarianism, and corruption that the Arabic regions endure, Arab social psychology has placed minimal focus on intergroup relations that remains imperative to addressing the region's challenges (Saab, Ayanian &

Hawi, 2020). This research, therefore, could shed light on how religion may build or exacerbate intergroup relations between conflicting groups.

## Aims, Hypotheses, and Structure

### *Aims*

This study aims to answer the following two research questions:

Research Question 1. To what extent does an individual's religious membership predict their trust in members of religious outgroups?

Research Question 2. To what extent is the relationship between religiosity and trust in members of religious outgroups influenced by a country's level of political stability?

### *Hypotheses*

1. Individuals who identify with a religious denomination will demonstrate greater trust in members of religious outgroups compared to individuals who do not identify with a religious denomination.

2. The relationship between religiosity and trust in members of religious outgroups will be positively influenced by a country's level of political stability.

### *Structure*

The current Introduction has presented the research problem, its significance, its theoretical foundations, and an overview of the aims. The following Methodology section details the research design, the data sets used to assemble the variables employed in the analysis, and the ethical considerations (elements of the Introduction and Methodology are adapted from the study pre-registeration; see Compendium). The Results section presents the results of the two analyses used to answer the two research questions. The Discussion section summarizes and critically evaluates the findings and situates them into the theoretical and empirical literature, noting the study's limitations and opportunities for future research. Finally, the Conclusion recapitulates the study's aims, its findings, and its contributions.

# Methodology

## Research Design and Justification

The study employed a quantitative secondary data analysis (SDA) of responses from 77,419 participants across 61 countries obtained from a synthesis of data sets. A SDA was chosen because it offered several advantages relevant to the research questions. First, secondary data provided a large cross-cultural sample that ensured the study was sufficiently powered and the findings were generalisable across a diverse demographic. This was important because it provided a sample that representd a large range of religious denominations and regions to ensure that the findings were not restricted to any specific religious group or region, overcoming the limitation of existing research that draws a Christian-majority sample, employs an ethnographic design, or focuses on WEIRD populations (Western, Educated, Industralized, Democratic) (Henrich, Heine & Norenzayan, 2010; Purzycki et al., 2016). Second, a SDA enables the synthesis of multiple data sets that provide important measures not captured by a singular data set. This study leveraged this advantage of SDA by combining individual-level responses in religious affiliation with country-level differences in political stability to answer Research Question 2.

However, SDA is limited in some ways. First, given the original measurements were designed for an alternate purpose, the WVS items may not be completely reflective of the constructs that the current study focuses on (Johnston, 2014). However, this limitation was ameliorated by careful selection of questionnaire items guided by the literature. Second, while SDA enabled the synthesis of multiple data sets, discrepancies between the data sets made exact alignment challenging. For example, data for a specific year were not available for every country of interest across every data set. This was addressed by first selecting data sets that were maximally comprehensive in scope compared to the WVS data, and secondly,

by imputing the few cases of missing data with reasonable alternatives. The precise imputations are outlined and justified in the Data Description.

**Data Description**

This study utilized publicly available secondary data from four different data sources including the World Values Survey, the World Bank's Worldwide Governance Indicators, the World Bank's World Development Indicators, and Freedom House. The data sets were merged at a country-level to create the predictor and outcome measures of religious membership, religiosity, trust, and political stability. The data sets were also used for control variables, including gender, age, educational attainment, income, individual freedom, and GDP per capita. The data sets were downloaded individually and subsequently pre-processed and merged in the programming language R. All data sets, questionnaires, codebooks, and code used for data cleaning are included in the Appendices folder of the Compendium. However, the WVS data set is not included as the Conditions of Use stipulate that the file is not to be redistributed; instead, it can be downloaded under the "Statistical Data Files" section on the WVS website. This sub-section will describe the data set used for each measure, the justification for its selection, its availability, the procedures used to collect the data, its notable limitations, and the justification for the chosen control variables. The sub-section concludes with a description of the exclusion criteria applied to these data sets.

1. Religious Membership, Religiosity, Trust, and Control Variables

Religious membership, religiosity, and trust measures drew data from the latest wave of the World Values Survey (WVS): wave 7. The WVS is a cross-cultural survey that monitors a range of cultural values, including moral, familial, and religious values and is advantageous for this project because it provides individual-level measures of both religious affiliation and trust in religious outgroup members that enables within-person comparison across a large cross-cultural sample. The data was classified as longitudinal data collected

between 2017-2022, with a 1-year postponement due to the COVID-19 pandemic. However, most of the data was collected between 2018-2020, with about 10 of the countries collecting data after the pandemic. The data covered 64 countries and included responses to 14 thematic sub-sections that included societal well-being, economic values, and religious values.

Subsets of the data were used to construct the final data set. Items Q94R, Q6, and Q62 were used for the religious membership, religiosity, and trust measures, respectively. Two religion measures were extracted to meet the specific requirements of the two research questions. Q94R assessed whether a respondent identified as a member of a church or religious organization, coded as a categorical dichotomous variable: this was appropriate for research question 1 designed to isolate the role of religious membership on an individual's trust of religious outgroup members. The second religion measure, Q6, assessed the degree to which religion was important to a respondent's life, coded as a discrete numerical variable ranging from 1 to 4: this was appropriate for research Question 2 as its discrete form enabled a more granular assessment of the effect of religion on trust at different levels of political stability. Finally, Q62 assessed the degree to which a respondent trusted people from another religion, coded as a discrete numerical variable ranging from 1 to 4. Both religiosity (Q6) and trust (Q62) measures were reverse coded for ease of interpretation in the analysis. Additionally, the control variables of gender (Q62) and age (Q262) were extracted to control for confounding effects, based on literature indicating a positive effect of age on cooperation, and that males are shown to be more cooperative during situations of intergroup competition while female cooperativeness is unaffected (Van Lange et al., 1997; Vugt, Cremer & Janssen, 2007). The controls of educational attainment (Q275) and income (Q288) were also extracted based on convention in this research domain, as advocated by Purzycki et al. (2018). Finally, religious denomination (Q289, Q289CS9) was extracted for descriptive statistics.

The data was obtained from the WVS website in its csv format (non-inverted scales) and was confirmed as open-source with no access restrictions upon completion of the registration form. The default non-inverted scales format was used to ensure ease in replication and in future research. The data collection procedure was well documented by Haerpfer et al. (2022): in summary, the WVS employed a combination of random probability sampling and stratified sampling representative of the respective country's adult population and produced survey data primarily through face-to-face interviews with individual respondents at their place of residence. This was occasionally supplemented by other methods such as internet panels and telephone interviews. Given its international scope, the survey was translated from the English master questionnaire into Arabic, Spanish, and Russian. National survey teams were responsible for translation in instances where another language was required. Some questions were added, modified, or removed to the master questionnaire at the discretion of the national survey teams, for cultural appropriateness.

2. Political Stability

The political stability measure drew data from the World Bank's Worldwide Governance Indicators (WGI) database using its Political Stability and Absence of Violance/Terrorism series (Percentile Rank). This series measured perceptions of the probability of political instability and, or politically motivated violence and is an appropriate global measure of the construct in accordance with the literature (Hurwitz, 1973). The Percentile Rank was extracted for each country and was used to indicate the country's political stability relative to all the countries assessed by this series: higher scores represent greater political stability.

The advantage of this data lies in its temporal longevity and geographical scope. This data was classified as longitudinal data since 1996 that was collected biannually between 1996 and annually after 2002, with data available until 2021. The data was released at the end

of September of each year and was available for 214 countries and territories, covering all of those contained in the WVS. However, as noted previously, there remained a few countries whereby the WGI database did not provide a Percentile Rank for the year data was collected in the country; this includes the 2022 ranks for Czechia, Libya, Netherlands, Slovakia, Great Britain, Uruguay, and Northern Ireland. The data for those countries in 2022, therefore, was imputed with the closest available datapoint obtained in 2021 on the justification that political stability is generally stable year-over-year. The data was extracted directly from the WGI open-source database with no restriction to access, filtered for years 2017-2021 to align with the temporal scope of the WVS.

The data collection procedure was well documented by Kaufmann, Kraay, and Mastruzzi (2010): the data was based on the aggregation of survey responses from households and firms, alongside assessments produced by experts from public, private, and NGO sectors. Examples of source data include the Afrobarameter surveys, Freedom House, and regional development banks. The aggregation method can be viewed in detailed in Kaufmann, Kraay, and Mastruzzi (2010) under section “4. Constructing the Aggregate WGI Measures”.

3. Individual Freedom

A country’s political system in the form of individual freedom was a necessary control variable as literature demonstrates that positive democratic attitudes are associated with greater trust and volunteerism (Tov & Diener, 2009). Individual freedom data was attained from Freedom House’s Freedom in the World report – specifically, its Global Freedom scores. Global Freedom measures a composite of political rights and civil liberties and is scored out of 100, with higher scores indicating greater freedom. The longitudinal data was iterated annually with availability since 2013, and its 2022 edition included 195 countries and 15 territories. The advantage of this data set lied in its scope which covered all the

countries contained in the WVS, and in its treatment of individual freedom as a continuous variable which ensures maximal sensitivity in measurement and simplicity in interpretation. The publicly available data was sourced from Freedom House's website and was accessed on in its xlsx format, filtered for 2017-2021 (FIW 2013-2022). Global Freedom scores for each country were sourced from "Total" (column AR). Procedurally, the scores were reported by a team of external and in-house analysts along with expert advisors who determined scores based on a range of sources such as academic analyses and nongovernmental reports, checked against a list of scoring criteria. The scores were discussed and defended via meetings with an advisory panel and the Freedom House staff – the subjectivity of this process is a limitation of this data. However, it remains useful in illustrating broad trends in individual freedoms, rather than granular distinctions, that are appropriate for this study.

4. GDP Per Capita

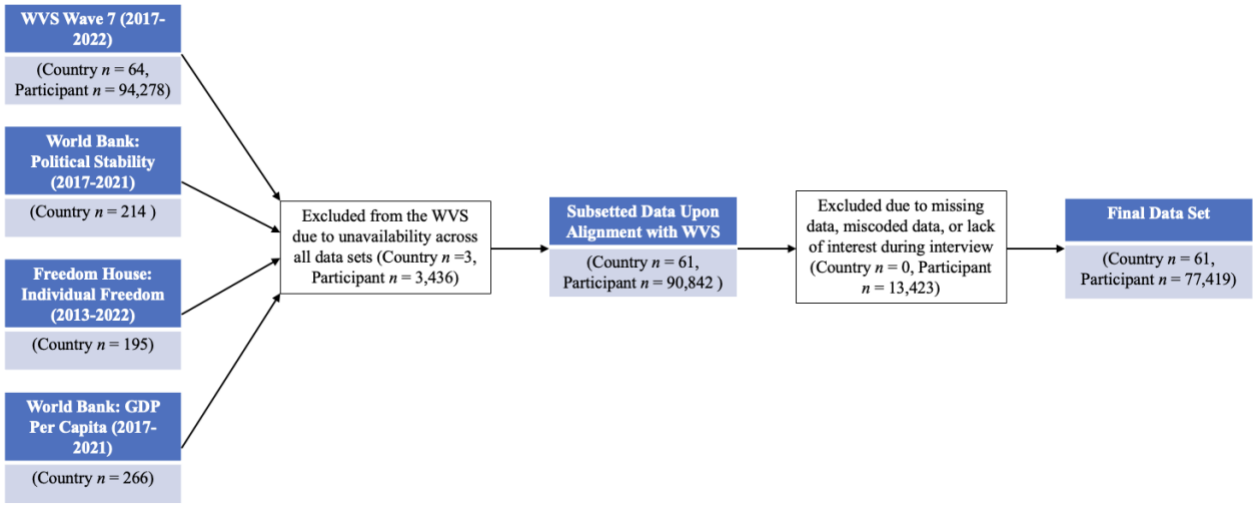
Finally, GDP per capita was used as a control variable, consistent with Purzycki et al.'s (2018) finding that GDP has a positive effect on cooperation. This data was sourced from the World Bank's World Development Indicators (WDI) – specifically, its GDP per capita (current US$) series. This indicator measured a country's gross domestic product divided by its midyear population and was represented in current U.S. dollars; in addition to being comprehensive in scope, this measure usefully controls for differences in population and currency. This longitudinal data is available for years 1960-2021 and is derived from World Bank national accounts data and OECD National Accounts data files. Like for political stability, the GDP per capita indicators were only provided until 2021. Therefore, the 2022 data for Czechia, Libya, Netherlands, Slovakia, Great Britain, Uruguay, and Northern Ireland were imputed with the closest available datapoint obtained in 2021 on the justification that GDP is generally stable year-over-year. The data, filtered for years 2017-2021, was downloaded from the WDI open-source database as a csv file and was publicly available.

## Exclusion Criteria

To ensure a maximally representative sample, the study included all countries in the WVS that were also included in the remaining three data sets: 3,436 participants and 3 countries were removed due to unavailability across all data sets. Participants who provided non-responses, such as “no answer”, “not asked”, or “missing”, were deemed invalid and removed. To ensure data quality, participants who were judged to be “not interested” during the interview were removed based on item “E_RESPINT”. Further data quality checks identified two participants with miscoded gender variables and were removed. 14,020 participants and 0 countries were removed following data quality checks. The final data set contained 61 of the 64 countries included in wave 7 of the WVS, with Taiwan ROC, Venezuela, and Macao SAR excluded due to lack of availability across the data sets used for political stability and GDP per capita. The final data set contained 77,419 participants from the original 94,278. The inclusion-exclusion flowchart is illustrated in Figure 1.

**Figure 1**

*Inclusion and Exclusion Flowchart Detailing Construction of the Final Data Set*




## Ethical Considerations

Given this study analyzed secondary data, it did not pose any immediate ethical concerns. An ethics application was submitted to the LSE under the reference 140627 and it

was confirmed on November 30, 2022 that ethics approval was not required (see Ethics in the Compendium). There are no conflicts of interest to disclose.

## Results

Two analyses were conducted to answer the two research questions specified in the Introduction. This section presents relevant descriptive statistics, justifies the choice of analyses, and presents their corresponding results.

### Descriptive Statistics

The final analyses included 77,419 participants from 61 countries, captured between 2017 and 2022. 29,818 participants identified as religious and 47,601 participants identified as non-religious, with representation of 105 religious denominations: the distribution of major denominations is visualized in Figure 2. Inspection of the dichotomous variable of religious membership indicated an incrementally higher mean trust score of 2.40 for religious members, compared to a mean of 2.27 for non-religious members. Descriptive statistics for the primary numerical variables are included in Table 1: religiosity, trust, and political stability exhibited means of 3.06, 2.32, and 43.59, respectively. The correlation matrix for the numerical variables is visualized in Figure 2; although strong positive correlations were observed between GDP per capita, political stability, and individual freedom, variance inflation factors for all variables were below 5, indicating no issues with multicollinearity.

**Table 1**

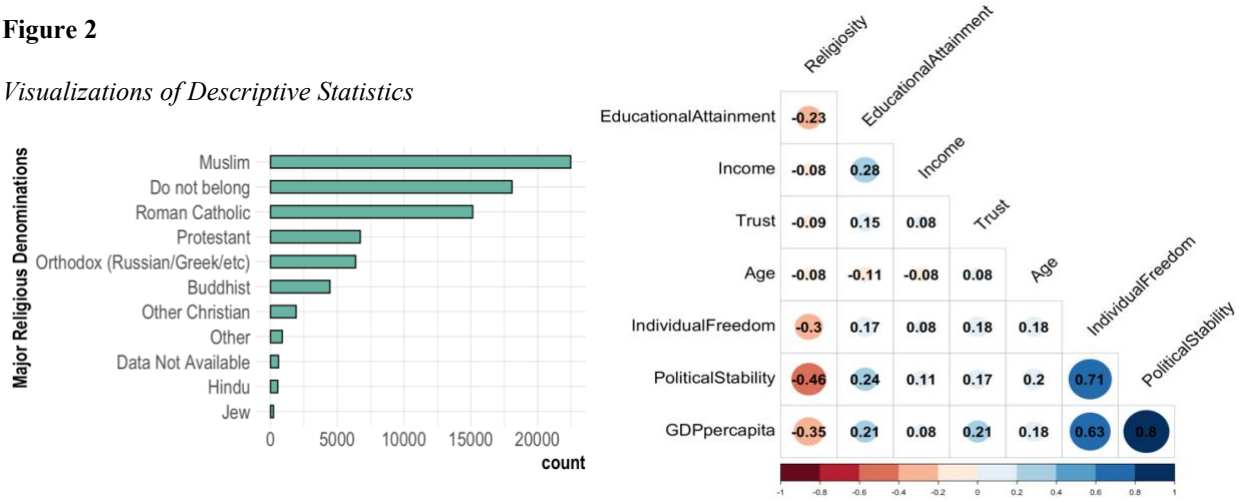
*Descriptive Statistics for Primary Numerical Variables of Religiosity, Trust, and Political Stability*

| Variable | *M* | *SD* | Median | Range | Skew | Kurtosis | *SE* |
|---|---|---|---|---|---|---|---|
| Religiosity | 3.06 | 1.09 | 3.0 | 3.0 | -0.73 | 2.10 | 0.004 |
| Trust | 2.32 | 0.87 | 2.0 | 3.0 | -0.08 | 2.15 | 0.003 |
| Political Stability | 43.54 | 28.46 | 35.85 | 96.23 | 0.36 | 1.89 | 0.10 |

*Note.* $n$ = 77,419. Values are rounded to one significant figure if their two decimal places are not significant.

**Figure 2**

*Visualizations of Descriptive Statistics*




*Note.* The bar plot (left) visualises the distribution of major religious denominations included in the analysis. Missing values are represented with "Data Not Available". The correlation matrix (right) visualises the Pearson's correlations for the numeric variables included in the analysis.

## Regression Analysis

First, a regression analysis was used to answer research question 1: the extent an individual's religious membership predicted their trust in members of religious outgroups. OLS regression was justified as it enabled a test of the effect of a categorical dichotomous variable on a continuous outcome variable while accommodating continuous control variables. The model was fit with the predictor variable of religious membership whereby the values of 1 and 0 were used to represent individuals who identified as a member of a church or religious organization and individuals who did not, respectively. As justified in the Methodology, the model also controlled for gender, age, educational attainment, income, GDP per capita, and individual freedom. The model is summarized in Table 2, whereby religious membership demonstrated a positive and statistically significant effect on trust in members of religious outgroups ($b$ = 0.15, $p$ < .001, 95% CI [0.14, 0.16]). The unstandardized beta coefficient of 0.15 indicated that on average, identification as a member of a church or religious organization was associated with a 0.15 increase in trust: this effect was statistically significant as evidenced by $p$ < .001. The control variables of age,

educational attainment, income, GDP per capita, and individual freedom all demonstrated small yet statistically significant positive effects on trust. Gender, coded as 1 and 0 for females and males, respectively, indicated reduced trust scores for females. To avoid assumption of a normal sampling distribution, 95% bootstrap confidence intervals (CI) were generated for each estimate using 5,000 resamples with replacement. The 95% CIs did not include zero for any of the predictors used in the model, reinforcing the statistically significant findings under standard theory.

**Table 2**

*Regression Model of the Effect of Religious Membership on Trust with Control Variables*

| Variable | *b* | *SE* | *t* | *p* | 95% CI [*LL, UL*] |
|---|---|---|---|---|---|
| (Intercept) | 1.75 | 0.02 | 105.88 | < .001 | [1.72, 1.78] |
| Religious Membership | 0.15 | 0.01 | 23.91 | < .001 | [0.14, 0.16] |
| Gender | -0.05 | 0.01 | -7.64 | < .001 | [-0.06, -0.03] |
| Age | 0.003 | 0.0002 | 16.60 | < .001 | [0.003, 0.004] |
| Educational Attainment | 0.05 | 0.002 | 29.70 | < .001 | [0.04, 0.05] |
| Income | 0.01 | 0.002 | 9.87 | < .001 | [0.01, 0.02] |
| GDP per capita | 0.000006 | 0.0000002 | 33.16 | < .001 | [0.000005, 0.000006] |
| Individual Freedom | 0.001 | 0.00 | 10.03 | < .001 | [0.001, 0.002] |

*Note.* Values are rounded to one significant figure if their two decimal places are not significant. CI = confidence interval; *LL* = Lower Limit; *UL* = Upper Limit.

## Multi-level Analysis

Next, a multi-level analysis was used to answer Research Question 2: the extent the relationship between religiosity and trust is influenced by a country's level of political

stability. A multi-level model was justified due to the presence of clustered data: within-person differences in trust were nested within between-country differences in political stability. The presence of clustered data suggested that level-1 observations were not independent and thus violated the assumption of independent residuals held by the generalized linear model (Nezlek, 2008). The presence of nested data was verified by the intraclass correlation coefficient (ICC) using an empty model: an ICC of 0.13 demonstrated that 13% of the variance in trust were due to between-country differences in political stability, meeting the 0.10 threshold by which multi-level analysis is justified (Vajargah & Masoomehnikbakht, 2015).

Therefore, a 2-level multi-level model was fitted using religiosity and political stability to predict differences in trust: religiosity was included as the level-1 within-person predictor and political stability was included as the level-2 between-country predictor. Religiosity and political stability were grand-mean centred using z-score standardization to ensure scores represented an observation's deviation from the overall sample mean by units of standard deviation. Control variables were included as fixed effects. The fixed and random effects are presented in Tables 3 and 4, respectively. The expected value of trust for the average participant with the average value of religiosity was 1.81, and every unit increase in religiosity was associated with a 0.05 increase in trust: the associated 95% CI did not include zero, indicating that this fixed effect was statistically significant ($b$ = 0.05, $t$ = 2.80, 95% CI [0.01, 0.08]). Random effects revealed statistically significant between-country variability in trust (variance = 0.06, $SD$ = 0.25, 95% CI [0.19, 0.29]) and within-country variability in trust based on religiosity (variance = 0.01, $SD$ = 0.11, 95% CI [0.09, 0.13]). Most notably, to isolate the effect of political stability on the relationship between religiosity and trust, the interaction effect showed that the relationship between religiosity and trust varied based on political stability, revealing a moderation effect ($b$ = 0.03, $t$ = 1.53, 95% CI [-0.008, 0.06]).

The associated 95% CI included zero, indicating that this effect was not statistically significant. However, the Johnson-Neyman plot in Figure 3 confirmed that the moderation effect of political stability was positive and statistically significant when political stability was higher than -0.40 units of *SD* away from the sample mean, but not lower ($p < 0.05$). While the fixed effect of political stability indicated a positive and significant effect on trust, this effect was negative and not significant when controls were added to the model ($b = -0.07$, $t = -1.23$, 95% CI [-0.18, 0.04]).

**Table 3**

*Fixed Effects of 2-level Multi-level Model With Control Variables*

| Fixed Effects | *b* | *SE* | *t* | 95% CI [*LL, UL*] |
|---|---|---|---|---|
| Intercept | 1.81 | 0.07 | 24.73 | [1.66, 1.95] |
| Religiosity | 0.05 | 0.02 | 2.80 | [0.01, 0.08] |
| Political Stability | -0.07 | 0.06 | -1.23 | [-0.18, 0.04] |
| Religiosity:Political Stability (Interaction) | 0.03 | 0.02 | 1.53 | [-0.008, 0.06] |
| Age | 0.002 | 0.0002 | 9.81 | [0.002, 0.002] |
| Educational Attainment | 0.04 | 0.002 | 20.84 | [0.03, 0.04] |
| Income | 0.02 | 0.001 | 10.52 | [0.01, 0.02] |
| GDP per capita | 0.000009 | 0. 000003 | 3.31 | [0.000003, 0.00001] |
| Individual Freedom | 0.002 | 0.0008 | 2.97 | [0.0008, 0.004] |

*Note.* Values are rounded to one significant figure if their two decimal places are not significant. CI = confidence interval; *LL* = Lower Limit; *UL* = Upper Limit. Religiosity and political stability were grand-mean centred using standardization.

**Table 4**

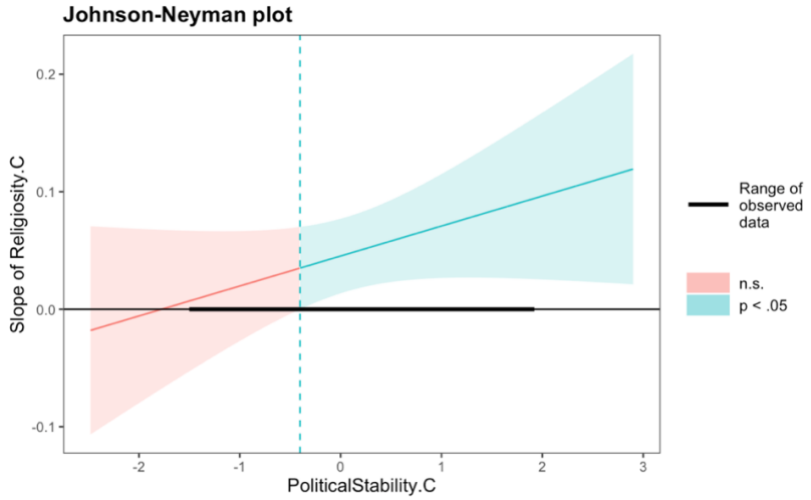
*Random Effects of 2-level Multi-level Model With Control Variables*

| Random Effects | Variance | *SD* | 95% CI [*LL, UL*] | Correlation |
|---|---|---|---|---|
| Intercept | 0.06 | 0.25 | [0.19, 0.29] | 0.19 |
| Religiosity | 0.01 | 0.11 | [0.09, 0.13] | |
| Residual | 0.63 | 0.79 | | |

*Note.* Values are rounded to one significant figure if their two decimal places are not significant. CI = confidence interval; *LL* = Lower Limit; *UL* = Upper Limit. Religiosity and political stability were grand-mean centred using standardization.

**Figure 3**

*Johnson-Neyman Plot of the Interaction Effect between Religiosity and Political Stability on Trust*




*Note.* Religiosity.C and PoliticalStability.C represent the grand-mean centred variables of religiosity and political stability, respectively. The range of observed values of political stability was [-1.48, 1.90].

## Discussion

### Summary of Key Findings and Relevance to the Research Questions

The purpose of this study is to examine the relationship between an individual's religious membership and their trust in religious outgroup members, and how this relationship is influenced by political stability. The study identifies three key findings. First, the regression analysis demonstrates that identification as a member of a religious organization is positively associated with trust in religious outgroup members: this

relationship is statistically significant even when controlling for relevant confounds including gender, age, educational attainment, income, GDP per capita, and individual freedom ($b$ = 0.15, $p < .001$, 95% CI [0.14, 0.16]). Therefore, the results support the hypothesis that individuals who identify with a religious denomination would demonstrate greater trust in members of religious outgroups compared to individuals who do not identify with a religious denomination, providing an answer to research question 1.

Second, the multi-level analysis shows that increases in religiosity correspond with greater trust in religious outgroup members ($b$ = 0.05, $t$ = 2.80, 95% CI [0.01, 0.08]). This provides granularity to research question 1 by suggesting that trust is positively influenced by the strength of an individual's religious belief. Third, between-country differences in political stability moderates the relationship between religiosity and trust ($b$ = 0.03, $t$ = 1.53, 95% CI [-0.008, 0.06]). Therefore, variance in the effect of religiosity on trust is partly explained by between-country differences in political stability. While this overall effect is not statistically significant, probe of the interaction term reveals that political stability does demonstrate a significant effect on the relationship between religiosity and trust when political stability is greater than -0.40 units of *SD* away from the sample mean. Interpretation of this grand mean centred variable suggests that the effect is significant when political stability is at the 32.16 percentile rank or higher, but not significant when stability is lower. This finding partially supports the hypothesis that a country's level of political stability would demonstrate a positive effect on the relationship between religiosity and trust, providing an answer to research question 2.

**Critical Analysis of Findings**

Existing research has shown that religion effectively facilitates large-scale cooperation by enhancing an individual's prosociality, including increasing fairness in social exchange, decreasing in-group tribal competition, and reducing rule-breaking behaviors

(Ibrahim, 2011; Norenzayan et al., 2014; Purzycki et al., 2016). However, it remained unclear whether this enhanced prosociality scaled to members beyond an individual's immediate religious group. The results of the current study represent the first demonstration of the positive association between religious affiliation and trust in members of religious outgroups, building on previous research by showing that the prosocial effects of religion, namely trust, do scale to members of other religions. The results also build on White, Muthukrishna, and Norenzyan's (2021) finding that religions share overlapping cultural traits by showing that these overlaps are associated with significant prosocial outcomes in interpersonal trust between religious individuals, regardless of denomination. Further, while past research has focused on the effect of political stability on societal-level outcomes, the current study shows that political stability also influences individual-level prosociality, including trust of religious outgroup members. Interestingly, while the relationship between religiosity and trust is not significant at low levels of political stability, the effect is not negative: the absence of a significant negative effect suggests that even in conditions of instability, religious affiliation does not necessarily lower trust between groups, and instead, the proclivity towards trust is simply suppressed. Importantly, the scope of this study provides confidence that the results are robust cross-culturally: its grounding in 77,419 participants across 61 countries and 105 religious denominations ensures that the findings are generalizable across demographically diverse countries and multiple religious denominations, effectively overcoming the limitations of small-scale, Christian-majority samples that have driven psychology of religion research to date.

**Implications**

The current findings have several significant theoretical and practical implications. Theoretically, the increased tendency for religious members to trust members of religious outgroups suggests that the boundaries of religious cultural groups extend beyond singular

religions. The findings reinforce the position that CGS simultaneously occurs on multiple levels in the form of multi-level selection, and religious denominations are nested within an overarching group of similar religious cultural traits (Kramer & Meunier, 2016). This furthers our understanding of the evolutionary origins of religion by first showing that religion not only confers group-level benefits at the level of a specific denomination but at multiple levels of cultural groups. Second, competition incurred by cultural group selection acts on multiple levels of religion simultaneously and in some instances, can constrain competition at one level while enhancing prosociality at another level. In this way, the finding that the relationship between religiosity and trust is moderated by political stability provides an example of how CGS addresses the challenge of multiple equilibria that arises when coordinating between these multiple levels of cultural groups. This study suggests that the payoffs of trusting religious outgroup members are only positive when the environment is moderately stable, and thus, CGS expands prosociality under such conditions. This position prompts a reconsideration of the boundaries of group identity assumed by classical social psychology. For instance, Social Identity Theory (SIT) posits that an individual's group identity produces behavioral outcomes such as ingroup favouritism and outgroup discrimination (Tajfel, 1978). However, this study shows that an individual's identification as a member of a specific religious denomination can be superseded by the more global identity as a religious individual, consistent with White, Muthukrishna, and Norenzyan (2021). Consequently, the downstream effects of group identity that can incite intergroup conflict are not inevitable and may not be expressed at the level of individual religious denomination. Importantly, the findings do not oppose SIT, but instead, suggest that group identity is situated within a hierarchically nested-structure and the salience of each level differs according to environmental conditions, likely varying with the payoffs associated with affiliation at each level. Moreover, this study's finding that the relationship between

religiosity and trust is positively associated with political stability also reinforces risk homeostasis theory. As political instability is an indicator of a high-risk environment, individuals under such conditions would optimize their risk tolerance by moderating their trust towards religious outgroups members.

Practically, the findings suggest that religious diversity does not inevitably lead to intergroup tension and conflict between denominations. Instead, religiously diverse societies can expect general religious affiliation to enhance trust and potentially cooperation between religious denominations, under the condition that the environment is moderately politically stable. Under such conditions, the association between religiosity and prosociality is expected to be strengthened: that is, more religious individuals are in fact more likely to trust members of religious outgroups. However, this expanded trust is still bounded in regions where political stability is extremely low. Therefore, highly unstable regions such those within MENA might not benefit from leveraging general religious affiliation to form group cohesion, despite the proclivity for prosociality being present.

**Limitations and Recommendations for Future Research**

The current study represents a first attempt to delineate the boundaries of religious prosociality and contains limitations that future research can address. First, given the constraints of limited pre-existing measures of secondary data, the study employs a measurement of trust as a proxy for cooperation. While evidence demonstrates that the two constructs are positively correlated, it is important to note that greater trust in religious outgroup members may not directly correspond to increased cooperation (Balliet & Van Lange, 2013). Relatedly, the study utilizes a series of self-report measures for religiosity and trust that are prone to demand characteristics and might not reflect behavioral outcomes. Therefore, the most pertinent next stage in this research domain is to collect primary behavioral data on cooperation with religious outgroup members. This can be achieved by

employing, for instance, game-theoretic public goods experiments including the ultimatum game and the prisoner's dilemma (Axelrod, 1980; Güth, Schmittberger & Schwarze, 1982). Second, the association between religious affiliation and trust is correlational and may be influenced by uncontrolled confounds. Third, this study examines trust on a global level that is undifferentiated towards specific religious denominations. While suitable for the current aims, a global indicator of trust does not account for historical and current tensions between two religions that influence an individual's trust of a member from a specific religious outgroup. Future research could focus on religion-to-religion comparisons which will enable more precise predictions about cooperative behavior between two groups.

## Conclusion

This study examined if the prosocial effects of religion, namely trust, expands to members of a different religious denomination, and if this relationship is influenced by political stability. Through analysis of cross-cultural secondary data, the study found that religious membership was associated with increased trust in members of religious outgroups. The degree of trust was positively associated with strength of religious belief. Further, the study established that the relationship between religiosity and trust was positively moderated by political stability when stability was moderate and high, but not low. This study contributes three novel findings to the literature by showing that religiously enabled trust does scale to members of religious outgroups, increases with religiosity, but is constrained at high levels of political instability. Therefore, this research provides support for cultural group selection theory and suggests that religious diversity does not inevitably lead to intergroup conflict; instead, religious affiliation can be used to promote trust under conditions of political stability. Future research can benefit from examining behavioral measures of cooperation and making religion-to-religion comparisons to establish the precise conditions under which the prosocial effects of religion scale to members of religious outgroups.

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