

# The Impact of Religiosity on Giving in Times of Uncertainty: Lessons from COVID-19

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## Abstract

*Prior research suggests that giving behaviors and attitudes toward giving can change during times of uncertainty. This makes it important to understand the dynamics of giving and perceptions of donors during such events. In this study we examine the role of uncertainty intolerance in the relationship between religiosity and giving. We explore two competing hypotheses with uncertainty intolerance playing the roles of mediator and moderator in this relationship. Although our empirical results ( $n = 1,733$ ) suggest that both of these roles were statistically not significant, we did find a very strong and robust effect of religiosity on giving. Our main finding is that perceptions about uncertainty did not affect giving in 2020 when the US was going through the COVID-19 crisis. Thus, in the US, giving is robust and remained stable during the pandemic-related uncertainty. These findings held across religious denominations but varied across several demographic characteristics and have some important implications despite limitations such as data being observational and US-specific with Muslim Americans oversampled.*

**Keywords:** giving, uncertainty intolerance, religiosity, COVID-19, mediation analysis, moderation analysis

## Introduction

The COVID-19 pandemic of 2020 created an unprecedented wave of uncertainty, disrupting economies, healthcare systems, and social structures across the globe (Kaye et al., 2021; Yeyati & Filippini, 2021). With more than 771 million confirmed cases and 6.9 million deaths reported as of November 2023 (WHO, 2023), the crisis posed significant challenges not only to individuals and families but also to philanthropic organizations. Historically, economic downturns have been associated with a decline in charitable giving, as donors prioritize financial security over discretionary spending during periods of economic instability (Brooks, 2018; Osili et al., 2019). Research shows that uncertainty heightens risk aversion, causing both individuals and institutions to reduce or delay donations (Gao et al., 2017; Hagenbaugh, 2008).

However, the COVID-19 crisis also presented contradictory trends. While many experienced financial hardship, charitable giving increased by 10% in volume and 15% in average donation size from 2020 to 2021, driven by heightened empathy and a sense of urgency to address the widespread suffering caused by the pandemic (BNY Mellon, 2022; Cho et al., 2022). These conflicting findings point to the need for a deeper exploration of the factors that shaped giving behavior during this period of uncertainty.

In this study, we examine the interplay between religiosity, uncertainty intolerance, and charitable giving in the context of the COVID-19 pandemic. Religiosity, encompassing religious affiliation, beliefs, and practices, has long been recognized as a key predictor of giving. Religious teachings often emphasize charity, compassion, and altruism, motivating adherents to donate to both religious and secular causes (Abdullah & Suhaib, 2011; Choi & DiNitto, 2012; Paxton et al., 2014). However, the strength of the relationship between religiosity and giving can vary, with some studies reporting weak or non-significant correlations (Eckel & Grossman, 2004; Roberts & David, 2019). This variability suggests that other psychological factors, such as uncertainty intolerance, may moderate or mediate the impact of religiosity on giving behavior.

Uncertainty intolerance, defined as the tendency to experience anxiety or distress in response to uncertain situations (Birrell et al., 2011; Carleton et al., 2012), plays a complex role in shaping decision-making during crises. Individuals with high uncertainty intolerance may hesitate to donate during periods of instability, as they focus on safeguarding their personal resources. Conversely, religious individuals may rely on faith-based coping strategies, such as prayer and community support, to reduce anxiety, thereby maintaining charitable behaviors even in uncertain times (MacIndoe & Sullivan, 2014; Shihata et al., 2016). Our study explores how uncertainty intolerance interacts with religiosity to influence charitable giving during the COVID-19 pandemic.

We propose two potential pathways for understanding these interactions: (a) moderation, where uncertainty intolerance alters the strength of the relationship between religiosity and giving, and (b) mediation, where uncertainty intolerance explains how religiosity translates into charitable behavior under uncertain conditions. Our research addresses three key questions: (a) did religiosity and uncertainty intolerance predict giving during the pandemic, (b) did uncertainty intolerance moderate the relationship between religiosity and giving, and (c) did uncertainty intolerance mediate this relationship? While prior studies highlight the role of both religiosity and economic uncertainty in shaping giving behavior, the COVID-19 pandemic presents a unique opportunity to assess these dynamics in an environment of heightened and pervasive uncertainty.

Our findings contribute to the growing body of literature on philanthropy in times of crisis by demonstrating that religiosity remained a robust predictor of charitable giving during the COVID-19 pandemic, despite widespread uncertainty. Surprisingly, we found that uncertainty intolerance did not significantly mediate or moderate the relationship between religiosity and

giving, suggesting that donors continued to prioritize charitable contributions regardless of personal anxieties about the future. These results highlight the resilience of giving in the face of adversity and underscore the importance of religiosity as a stabilizing force in philanthropic behavior during uncertain times.

### **Philanthropy in Uncertain Times**

Times of economic downturn and uncertainty have historically presented significant challenges for the philanthropic sector. It is well-established that the economic climate plays a substantial role in shaping charitable giving (Gao et al., 2017). For example, research conducted by the Giving USA Foundation has shown that dating back to 1967, a period that includes six recessions, economic downturns are often associated with reduced levels of charitable giving (Hagenbaugh, 2008). Studies such as those by Brooks (2018) and Osili et al. (2019) also support the notion that individuals tend to be less charitable during recessions, with the decline in giving being more pronounced when economic uncertainties persist over an extended period of time. Reasons for such declines are complex and involve various factors. For example, economic uncertainty can create an environment in which individuals and organizations become more risk averse. During economic downturns, people tend to be more cautious about their finances, prioritizing their immediate needs and financial security over discretionary spending on charitable causes (Brooks, 2018). The fear of job loss, reduced income, or economic instability can all work together and cause donors to cut back on their charitable donations, diverting their resources to address personal and familial financial needs. Donors may also hesitate to make long-term commitments to philanthropic organizations when the economic future appears uncertain, as they may be unsure about their capacity to fulfill those commitments in the long run (Osili et al., 2019). On a more macro level uncertainty in the philanthropic sector itself can contribute to a decline in charitable giving. During times of crisis or instability, philanthropic organizations may face challenges in terms of resource allocation, program delivery, and fundraising activities. Donors may become hesitant to contribute to organizations that appear less stable or effective in addressing the evolving needs of the community (MacIndoe & Sullivan, 2014).

However, recent data has challenged some of these historical patterns. Despite the ongoing healthcare-related impact of the pandemic, rising inflation, and pervasive uncertainty across various sectors, charitable giving exhibited an increase. According to one report, from 2020 to 2021 the number of charitable gifts increased by as much as 10%, and the average gift size grew by 15% (BNY Mellon, 2022). This upward trajectory in giving during COVID-19 was corroborated by additional evidence from Giving USA (2021) and the Fundraising Effectiveness Project (2022). One potentially significant driver of this surge was an acute awareness of the economic and health costs imposed by the pandemic on communities and vulnerable populations worldwide and the realization that the virus did not differentiate on the basis of income, age, race,

national origin, gender, or other demographic factors. As the virus spread rapidly and the associated economic fallout deepened, people around the world witnessed the struggles faced by those around them, which increased empathy and the desire to assist those in need thus compelling donors, both individuals and institutions, to provide immediate relief (Cho et al., 2022; van de Groep et al., 2020).

These conflicting and somewhat diametrically opposed findings about the relationship between perception of uncertainty and giving behavior warrant a fresh look at empirical data and raise interesting questions about whether the perception of uncertainty due to COVID-19 had any impact on giving behavior. We develop this line of thought more formally as a research question in a latter section of this study.

### **Religiosity and Charitable Giving**

Religiosity is a complex construct that encompasses dimensions like affiliation, activity, and beliefs and has long been recognized as a significant predictor of charitable giving (Choi & DiNitto, 2012; Mathur, 2012; Roberts & David, 2019). The interplay between religiosity and philanthropy is rooted in the core tenets of major religions, which put a premium on human values such as compassion, altruism, and charity with most mainstream religions including Christianity, Judaism, and Islam mandating compulsory donations from their followers (Abdullah & Suhaib, 2011; David, 1987; Topolski, 2016). Several past studies have examined the association between religiosity and diverse forms of altruistic behavior, including giving time, money, in-kind donations, and even blood, with most suggesting that this relationship is positive (Beyerlein, 2016; Paxton et al., 2014; Roberts & David, 2019). These studies also suggest that religious individuals tend to donate to both religious and secular causes and donate more compared to their non-religious counterparts (Monsma, 2007). However, findings such as these do not represent a complete consensus as some studies have found evidence of either a weak direct relationship (e.g., Roberts & David, 2019) or no relationship (e.g., Eckel & Grossman, 2004) between religiosity and giving.

### **Perception of Uncertainty as a Mediator and a Moderator**

While prior research suggests that uncertainty about the future and religiosity are both potential predictors of giving, the exact mechanism of their interaction is not clear. Our study fills this current gap in the literature by examining perceptions about uncertainty—for which we borrow the term uncertainty intolerance (or prospective anxiety; Birrell et al., 2011)—as a mediator and a moderator in the relationship between religiosity and charitable giving. Uncertainty intolerance refers to anxiety that arises from concerns and worries about future events, situations, or outcomes. Individuals experiencing anxiety often find themselves preoccupied with thoughts about potential negative events or challenges that they anticipate in the future, even when such events have not yet occurred, and can potentially influence those individuals' decisions, including their giving behavior (Birrell et al., 2011; Carleton et al.,

2012; Shihata et al., 2016). Thus, our study uniquely explores both the main effects and the combined (interactive) effect of religiosity and uncertainty intolerance on giving. Specifically, we pose the following research questions: (a) did religiosity and uncertainty intolerance predict giving during COVID-19, (b) did uncertainty intolerance moderate the relationship between religiosity and giving during COVID-19, and (c) did uncertainty intolerance mediate the relationship between religiosity and giving during COVID-19? Our corresponding hypotheses are

- H1. Religiosity and uncertainty intolerance predict giving during COVID-19.
- H2. The relationship between religiosity and giving during COVID-19 is not the same across different levels of uncertainty intolerance.
- H3. Uncertainty intolerance is a mediator in the relationship between religiosity and giving during COVID-19.

H2 is our moderation hypothesis, which will help us understand whether there is an interactive effect of religiosity and uncertainty intolerance on giving. The null hypothesis is that there is no interactive effect, i.e., the relationship between religiosity and giving does not vary across uncertainty intolerance levels. H3 is the mediation hypothesis with the null hypothesis of that uncertainty intolerance does not mediate the relationship between religiosity and giving. By investigating these hypotheses, we aim to provide a deeper understanding of the dynamics among key predictors of giving during uncertain times like a pandemic.

## **Methodology**

### *Sample and Participants*

The data used for this study came from the Charitable Giving Study (2020). This survey was undertaken in 2021 by 2,005 individuals of various religious, ethnic, and socioeconomic backgrounds in the United States and collected information on the behaviors, perceptions, attitudes, and demographics of respondents as it pertained to the 2020 calendar year when the survey was administered. The survey was commissioned by the Muslim Philanthropy Initiative (MPI) at the Lily Family School of Philanthropy, Indiana University–Purdue University Indianapolis.

The original sample size was 2,005. However, this was reduced to 1,733 due to missing values on analysis variables. Almost all of these missing values occurred on demographic variables, and for this reason were not imputed. Of the 1,733 retained respondents, most were Muslim (51.5%), male (53.5%), not students (78.1%), not of Hispanic origin (88.3%), White (65.9%), married (60.3%), tended to vote for the Democratic party (62.7%), earned \$50,000 or more per year (63.7%), and had a four-year college degree or higher education (50.7%). The respondent age in this sample ranged between 18 and 90 years with a median value of 39 ( $M = 42.7$ ,  $SD = 16.9$ ). The unit of analysis in our study is a typical American. Our participants come from a wide range of religious and ethnic backgrounds. However, we note that Muslims were

oversampled in the study because the original objective of MPI was to use this survey to generate reports specific to this religious group.

**Variables**

*Giving*

This variable was based on a survey question that asked respondents about the dollar value of their annual giving. The original distribution of this variable was highly skewed with several outliers. In order to minimize the effect of such extreme values we truncated the distribution of this variable at the 99<sup>th</sup> percentile. This was based on the observation that 99% of the respondents gave less than \$33,000 annually toward charitable causes during the year. The median giving was \$400 ( $M = \$2,538$ ;  $SD = \$4,846$ ). Since the mean is unreliable in highly skewed distributions (McClelland & Kokoski, 1994), we transformed *giving* by taking its natural logarithm. The original and transformed distributions are compared in panels (a) and (b) of Figure 1. The transformed distribution (panel b) still looks unusual because of the large frequency of respondents who did not give at all to charitable causes ( $n = 440$ ). Once these non-givers were dropped, the resulting distribution of *Giving* became significantly less skewed (Figure 1, panel c). The log-transformed variables had a mean of 6.90 (\$990) and a median of 6.91 (\$1,001).

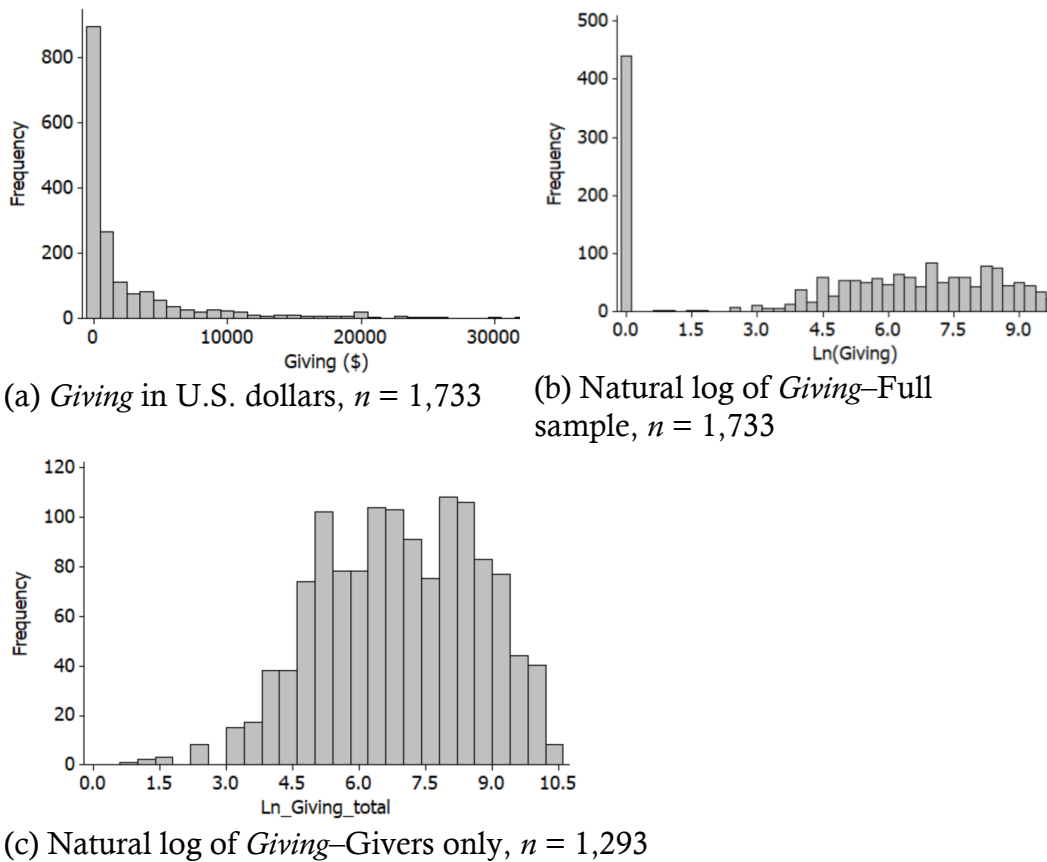


Figure 1. Histogram of (a) *Giving* in US dollars for the full sample, (b) natural log of *Giving* for the full sample, and (c) natural log of *Giving* for givers only. For the natural log transformation, a trivial amount (\$1) was added to *Giving*

for respondents who did not donate in order to avoid negative or undefined values on the transformed variable.

		Full sample <i>n</i> = 1,733		Givers only <i>n</i> = 1,293	
Scale and items		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Religiosity</i>		3.59	1.10	3.82	0.98
	How would you describe your feelings towards the following questions?				
1.	How often do you think about religious issues?	3.27	1.27	3.50	1.19
2.	To what extent do you believe that God or something divine exists?	4.21	1.25	4.39	1.08
3.	How often do you take part in religious services?	3.23	1.39	3.53	1.30
4.	How often do you pray?	3.67	1.33	3.91	1.20
5.	How often do you experience situations in which you have the feeling that God or something divine intervenes in your life?	3.58	1.31	3.81	1.20
<i>Cronbach's alpha</i>		0.89		0.88	

***Religiosity***

This scale measured the religiosity level of the respondent and was based on a total of five ordinal items that are summarized in Table 1. The scale had a reliability of 0.89 in the full sample and a reliability of 0.89 in the sub-sample of givers. The five items were combined into a single scale using factor analysis.

Table 1. Means and standard deviations for items comprising the *Religiosity* scale.

Note. Response choices for all items except item 2 ranged from 1 (never) to 5 (always). Item 2 had four categories: (1) I do not believe this, (2) I am unsure, (3) I believe this somewhat, and (4) I believe this absolutely. The responses for this item were statistically rescaled on a 1–5 scale for consistency with the remaining items.

For this analysis the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.86, Bartlett’s test of sphericity was significant ( $p < .001$ ), and the determinant of the correlation matrix was .06. These statistics represent the minimum standard needed to proceed with factor extraction. Factor analysis results suggested the presence of only one underlying dimension (Eigenvalue = 3.52, variance retained = 63.27%). All loadings for the extracted factor exceeded 0.7.

The distribution of religiosity is presented in panel (a) of Figure 2. Higher values on this scale are representative of a higher degree of religiosity. Factor scores were standardized ( $M = 0$ ;  $SD = 1$ ) in the full sample. Although our religiosity scale showed good performance in the sample, we do note that our choice of items was restricted by the items available in the source questionnaire. Religiosity is a complex and multidimensional construct and results from statistical analyses that can potentially change when it is measured in different ways. On a positive note, we did find that prior research supports the idea of the religiosity scale being invariant across religious traditions (e.g., see Mathur, 2012). For studies focusing on a single religious group, a religiosity scale especially developed for that specific group may be more appropriate (e.g., Mahudin, 2016).

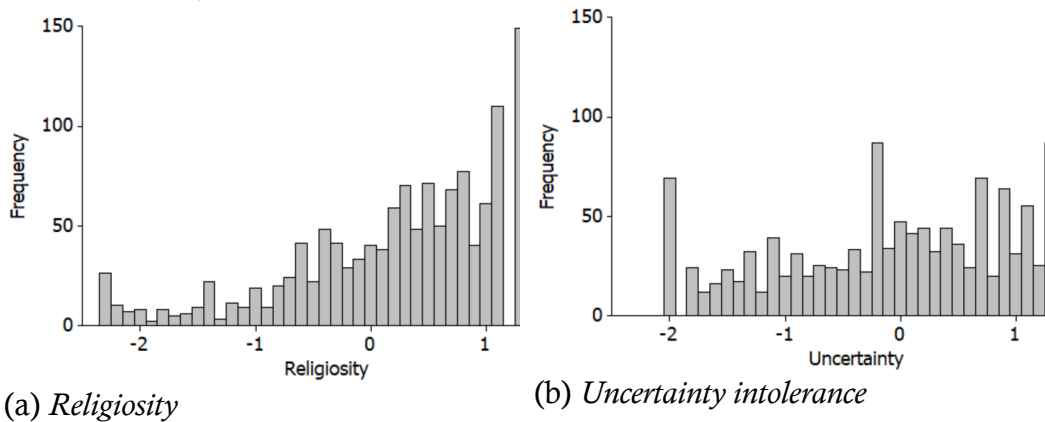


Figure 2. Histogram of (a) *Religiosity*, and (b) *Uncertainty intolerance*,  $n = 1,293$ .

***Uncertainty Intolerance***

This scale measures a respondent’s perception of the effect of uncertainty on their own self and was based on a total of five Likert-type agreement items that are summarized in Table 2. The scale had a reliability of 0.89 in the full sample and a reliability of 0.90 in the sub-sample of givers. The five items were combined into a single scale using factor analysis. For this analysis the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.88, Bartlett’s test of sphericity was significant ( $p < .001$ ), and the determinant of the correlation matrix was .06. These statistics satisfy the minimum requirements to proceed with factor extraction. Factor analysis results suggested the presence of only one underlying dimension (Eigenvalue = 3.51, variance retained = 62.78%). All loadings for the extracted factor exceeded 0.7. The distribution of uncertainty intolerance is presented in panel (b) of Figure 2. Higher values on this scale are representative of a higher degree of intolerance to uncertainty. Factor scores were standardized ( $M = 0$ ,  $SD = 1$ ) in the full sample. Our earlier observation for the religiosity scale being limited to survey items available in the source questionnaire, and the potential variation in statistical results stemming from different definitions of the construct apply equally to the uncertainty intolerance scale.

**Table 2.** Means and standard deviations for items comprising the *Uncertainty Intolerance* scale

		Full sample <i>n</i> = 1,733		Givers only <i>n</i> = 1,293	
Scale and items		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<i>Uncertainty intolerance</i>		3.20	1.10	3.26	1.14
	How strongly would you (agree) or (disagree) with the following statements?				
1.	Uncertainty keeps me from living a full life.	3.11	1.36	3.19	1.40
2.	When it's time to act, uncertainty paralyzes me.	3.01	1.36	3.09	1.41
3.	When I am uncertain, I can't function very well.	3.30	1.26	3.37	1.29
4.	I must get away from all uncertain situations.	3.41	1.25	3.47	1.29
5.	The smallest doubt can stop me from acting.	3.14	1.33	3.19	1.37
<i>Cronbach's alpha</i>		0.89		0.90	

Note. Response choices for all items ranged from 1 (strongly disagree) to 5 (strongly agree).

### ***Demographic Characteristics***

In addition to the main variables of interest the survey also collected information on a number of demographic characteristics. These include religion, gender, student status, education, Hispanic origin, race, geographical region, marital status, sexual orientation, annual income, political affiliation, voter registration status, whether the respondent voted in the 2020 presidential elections, and the degree of conservatism. These variables were used as demographic controls in order to account for potential confounding effects in our empirical models.

### **Data Analysis Approach**

We performed several statistical procedures to generate evidence for our research questions. In order to evaluate the effect of religiosity and uncertainty intolerance on giving for the full sample, we used a categorical version of giving that took a value of 1 for givers and 0 otherwise. This categorization was necessary due to the unusual shape of the transformed distribution of giving (Figure 1, panel *b*) that precluded any mean-based method for the full sample. The categorical giving variable was then entered as an outcome in a binary logistic regression model (giver 1; non-giver 0) that included all demographic variables, religiosity, and uncertainty intolerance as predictors.

For givers, our main approach included a series of general linear models (GLM) that predicted giving from demographic controls, religiosity, and uncertainty intolerance. Five separate models were specified as follows:

Model 1: Giving =  $f(\text{religiosity, uncertainty intolerance})$

Model 2: Giving =  $f(\text{religiosity, uncertainty intolerance, interaction})$

Model 3: Giving =  $f(\text{demographics})$

Model 4: Giving =  $f(\text{demographics, religiosity, uncertainty intolerance})$

Model 5: Giving =  $f(\text{demographics, religiosity, uncertainty intolerance, interaction})$

For example, in Model 4 the dependent variable is giving (continuous), the independent variables are religiosity, uncertainty intolerance as the main independent variables, and demographic factors as control variables. The interaction refers to a two-way interaction between religiosity and uncertainty intolerance. It can either be interpreted as the effect of religiosity on the relationship between uncertainty intolerance and giving, or the effect of uncertainty intolerance on the relationship between religiosity and giving. Both interpretations are valid and mathematically equivalent. It should be noted that when an interaction effect is significant in a model, the main effects of the variables that make up the interaction can be misleading and thus should not be interpreted. Models 1 and 2 were unadjusted models. Their purpose was to provide an upper limit on the proportion of variation in giving that can be explained by the main effects and the interaction effect of our primary predictors, i.e., religiosity and uncertainty intolerance. Models 3–5 were all adjusted for demographic factors and had a nested structure with Model 3 being a subset of Model 4, and Model 4 being a subset of Model 5. The aim of these models was to estimate the contribution of religiosity and uncertainty intolerance to the total amount of variation in giving over and above what can be explained by demographic differences. These models provide the lower limit of the proportion of variation in giving that can be explained by the main effects and the interaction effect of our primary predictors. In addition, since Model 5 contained the interaction term, it was used to evaluate the moderating role of uncertainty intolerance in the relationship between religiosity and giving.

For mediation analysis we ran a series of regression models that estimated the direct and indirect effect of religiosity on giving. For this analysis we first purified the outcome (giving), the mediator (uncertainty intolerance), and the predictor (religiosity) by partialing out the effect of all demographic factors. The choice of mediation and moderation analyses was motivated by our hypotheses. Our main hypothesis (H1) seeks to test the relationship of giving with religiosity and uncertainty intolerance, and we employed the main effects multiple regression (GLM) analysis for this purpose. However, the main effects model is insufficient to explore interaction effects among predictors. For example, if religiosity affects giving, then is this effect the same for uncertainty tolerant and uncertainty intolerant givers? Another (mathematically equivalent) way of posing this question is: If uncertainty intolerance affects giving, then is this effect the same for individuals with different religiosity levels? Such exploration of inter-predictor interactive effect on the outcome variable requires

enhancing the basic main effects multiple regression model with an interactive term. This enhanced model is called the moderation model. Our justification for the use of mediation analysis is simple. Mediation analysis is different from moderation analysis in that while the latter seeks to explore the effect of one independent variable on the dependent variable at different levels of a second independent variable, the mediation analysis seeks to uncover the path through which an independent variable affects the outcome. For example, does religiosity affect giving directly or is the effect more complex, for instance where religiosity affects uncertainty intolerance and uncertainty intolerance then in turn affects giving. The main effects multiple regression model and the interactive moderation model are both unable to answer this question, which requires estimation of three separate regression models. These are collectively referred to as the mediation analysis. In addition to logistic regression, GLM modeling, and mediation analysis, we also computed summary statistics, unadjusted and adjusted effect sizes, and performed a correlation analysis. The results of these procedures are discussed in the next section.

**Empirical Results**

In order to get an initial idea about the relationship between giving and the two primary predictors, religiosity and uncertainty intolerance, we performed a zero-order correlation analysis for the full sample as well as the sub-sample of givers. The two sets of correlation estimates are presented in Table 3. These suggest a highly statistically significant relationship between giving and the primary predictors,  $p < .001$ , with the association between religiosity and giving being stronger (full sample,  $r = .42$ ; givers only,  $r = .26$ ) than that between giving and uncertainty intolerance (full sample,  $r = .16$ ; givers only,  $r = .16$ ) in both samples.

Table 3. Correlations among *Giving*, *Religiosity*, and *Uncertainty Intolerance*

	<i>M</i>	<i>SD</i>		<i>r</i>		
				1	2	3
<b>Full sample, <i>n</i> = 1,733</b>			–			
			–			
			–			
			–			
1. Giving	\$2,537.9	\$4,846.2		–		
2. Religiosity	0	1		.42***	–	
3. Uncertainty intolerance	0	1		.16***	.33***	–
<b>Givers, <i>n</i> = 1,293</b>						
1. Giving	\$3,401.5	\$5,342.6		–		
2. Religiosity	0.21	0.89		.26***	–	
3. Uncertainty intolerance	0.06	1.04		.16***	.36***	–

Note. All reported coefficients are Pearson *r*. Cohen’s (1992) cutoffs for *r*: small effect, .1; medium effect, .3; large effect, .5. For correlations *Giving* was used in

natural log form. *Religiosity* and *uncertainty tolerance* are standardized factor scores.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

A GLM analysis that predicted giving supported an interactive effect of religiosity and uncertainty intolerance (Table 4, Model 2,  $R^2 = 8.9\%$ ). In other words, the effect of religiosity on giving varied at different levels of uncertainty intolerance, providing some support for the moderation hypothesis. However, this support is weak because the models presented in Table 4 did not control for demographic factors.

**Table 4.** Results from GLM Analysis Predicting *Giving*

Source of variation	<i>d</i> <i>f</i>	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Main effect</b>						
Religion	3	—	—	6.11** *	0.40__	0.39__
Gender	1	—	—	20.57* **	21.54* **	20.22* **
Student status	1	—	—	5.75* —	6.22* —	5.68* —
Education	5	—	—	4.03** —	3.54** —	3.54** —
Hispanic origin	1	—	—	0.35__	0.08__	0.05__
Race	3	—	—	2.35__	2.36__	2.30__
Region	3	—	—	0.69__	1.07__	1.04__
Marital status	4	—	—	2.73* —	1.89__	1.91__
Sexual orientation	3	—	—	1.32__	1.34__	1.25__
Income	7	—	—	15.35* **	16.92* **	16.65* **
Political affiliation	3	—	—	2.40__	2.29__	2.44__
Voter registration status	1	—	—	7.07** —	7.60** —	7.49** —
Voted in 2020 Pres. Elections	3	—	—	0.71__	0.47__	0.48__
Conservatism	4	—	—	5.06** *	1.50__	1.33__
Age	1	—	—	0.55__	0.05__	0.12__

Religiosity, $X_1$	1	65.58* **	82.51* **	—	44.13* **	45.20* **
Uncertainty intolerance, $X_2$	1	7.28**	1.84__	—	0.13__	0.02__
<b>Interaction</b>						
$X_1 \times X_2$	1	—	22.48* **	—	—	1.06__
$R^2$	—	7.3%	8.9%	32.5%	34.9%	34.9%
Adjusted $R^2$	—	7.1%	8.6%	30.2%	32.5%	32.5%

Note.  $n = 1,293$ .  $df =$  degrees of freedom.  $F =$  observed value of the test statistic.  $R^2$  interpretation based on Cohen (1992): Low, 2%; Medium, 13%; Large, 26%. Pres. = Presidential, \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

In order to see which demographic variables were significantly related to giving, we conducted a bivariate analysis. The results from this analysis as well as group sizes for all demographic predictors are summarized in Table 5. Most of the demographic factors included in this table turned out to have individually significant associations with giving,  $p < .001$ , thus justifying their inclusion in the more comprehensive and nested GLM models (Models 3–5). Estimates from these models are presented in Table 4 and contain several important results. First, the moderation effect that was earlier observed in Model 2 disappeared with the inclusion of demographic factors. In other words, the interaction effect was no longer statistically significant,  $p > .05$ . Second, the effect of religiosity on giving was highly significant,  $p < .001$ , and robust (significant effect in all models that included religiosity). On the other hand the effect of uncertainty intolerance on giving was generally insignificant. Thus, we found partial support for our first research question, but no support for the moderation hypothesis.

**Table 5.** Descriptive statistics for *Giving* by key demographic factors

Variable	$n$	Unit = \$		Unit = Ln(\$)		$p$	$\eta^2$
		$M$	$SD$	$M$	$SD$		
<b>Religion</b>						< .001	0.03
Islam	764	3,922	5,616	7.12	1.76		
Judaism	18	1,948	2,614	6.55	1.79		
Christianity	389	2,881	4,913	6.74	1.75		
Other	122	2,014	4,766	6.08	1.75		
<b>Gender</b>						< .001	0.09
Male	733	4,281	5,784	7.35	1.67		
Female	560	2,251	4,453	6.30	1.76		
<b>Student status</b>						.498	~0
Yes	322	3,410	5,475	6.84	1.85		
No	971	3,399	5,301	6.92	1.77		

<b>Education</b>							< .001	0.11
Less than high school graduate	14	1,101	1,862	5.77	1.75			
High school graduate	200	1,531	2,880	6.02	1.74			
Some college (including Associate's degree)	278	2,145	3,836	6.33	1.78			
Graduated college (4 year/Bachelor's degree)	471	3,955	5,735	7.20	1.68			
Graduate school or more	270	4,277	5,411	7.45	1.53			
Technical school/Other	60	7,713	9,292	7.85	1.86			
<b>Hispanic origin</b>							.530	~0
Yes	140	3,748	6,354	6.81	1.94			
No	1153	3,359	5,208	6.91	1.77			
<b>Race</b>							< .001	0.06
White	872	4,067	5,723	7.19	1.75			
Black	167	2,337	4,379	6.42	1.80			
Asian	162	1,356	2,361	6.05	1.61			
Other	92	2,632	5,710	6.53	1.71			
<b>Region</b>							.517	~0
Northeast	307	2,855	4,757	6.79	1.70			
North Central	232	3,376	5,147	6.89	1.79			
South	479	3,634	5,743	6.90	1.85			
West	275	3,628	5,382	7.02	1.77			
<b>Marital status</b>							< .001	0.10
Single, that is never married	282	1,909	4,371	6.07	1.83			
Single, living with a partner	54	1,851	2,847	6.34	1.77			
Married	852	4,211	5,770	7.30	1.66			
Separated/Widowed	46	1,763	3,011	6.39	1.53			
Divorced	59	1,544	3,457	5.97	1.64			
<b>Sexual orientation</b>							.020	0.01
Straight, that is, not lesbian or gay	1156	3,235	5,110	6.85	1.78			
Gay or Lesbian	33	4,000	4,968	7.17	2.02			
Bisexual	86	4,838	6,674	7.41	1.66			
Transgender/Something else	18	6,142	10,251	7.30	1.84			
<b>Income</b>							< .001	0.20
Less than \$15,000	64	880	2,733	5.14	1.63			
\$15,000 but less than \$25,000	85	789	1,270	5.67	1.49			
\$25,000 but less than \$30,000	67	1,301	2,350	5.87	1.71			

\$30,000 but less than \$40,000	73	1,830	3,269	6.16	1.79		
\$40,000 but less than \$50,000	81	1,982	3,566	6.35	1.80		
\$50,000 but less than \$75,000	230	2,079	3,385	6.60	1.54		
\$75,000 but less than \$100,000	215	3,322	4,157	7.18	1.61		
\$100,000 or over	478	5,651	6,997	7.72	1.57		
<b>Political affiliation</b>						< .001	0.03
Republican	296	4,015	5,844	7.17	1.75		
Democrat	725	3,644	5,510	6.97	1.80		
Independent	251	2,132	3,909	6.45	1.68		
Other	21	1,542	4,284	5.77	1.81		
<b>Voter registration status</b>						< .001	0.04
Yes	1174	3,596	5,467	7.02	1.75		
No	119	1,483	3,369	5.72	1.72		
<b>Voted in 2020 Presidential Elections</b>						< .001	0.05
Republican Party	333	3,655	5,648	7.05	1.76		
Democratic Party	848	3,583	5,436	6.99	1.75		
Another candidate/party	19	1,990	2,779	6.48	1.70		
Did not vote	93	1,129	2,450	5.57	1.66		
<b>Conservatism</b>						< .001	0.05
Very conservative	256	5,599	6,694	7.59	1.80		
Somewhat conservative	163	2,798	4,308	6.91	1.64		
Moderate	444	2,349	3,910	6.57	1.69		
Somewhat liberal	192	2,147	3,797	6.44	1.68		
Very liberal	238	4,427	6,681	7.12	1.88		
<b>Age</b>	1,293	–	–	–	–	.905	~0

Note.  $n = 1,293$ . ~0 means approximately zero. The  $p$  values reported in this table are based on unadjusted group mean comparisons using *Giving* in natural log form (independent samples  $t$  test/ANOVA). The last column reports eta square which can be interpreted as follows: Low, .01; Medium, .06; High, .14 (Cohen, 1988). For numeric *Age*, the reported effect size is  $R^2$ .

The main effects model explained 34.9% of the total variation in giving and thus represents a large effect size (Cohen, 1992). Our finding of a significant association between religiosity and giving is in line with past studies such as Choi and DiNitto (2012), Mathur (2012), and Roberts and David (2019). In addition to religiosity, other factors that had a statistically significant and robust effect on giving across our GLM models included gender, education, income, student status, and voter registration status. For instance, our results suggest that holding all else constant, (a) males give more than females,  $\Delta M = \$2,030$ ;

(b) students give more than non-students,  $\Delta M = \$11$ ; (c) giving increases with education, average  $\Delta M = \$1,322$ ; (d) giving increases with income, average  $\Delta M = \$682$ ; (e) registered voters give more than their non-registered counterparts,  $\Delta M = \$2,113$ ; and (f) an increase of 1SD in religiosity increases giving by 50%. Most of these findings make intuitive sense in our largely Muslim American sample. For instance, it is well-known that Muslim families tend to be patriarchal with men making most significant financial decisions; high education translates into better job opportunities and consequently higher income, all of which tend to increase *nisab*, the minimum Islamic threshold for mandatory giving; and higher religiosity translates into higher commitment to religious principles such as *zakat* (mandatory annual Islamic giving). Why students give more than non-students is a bit puzzling at first, but we see that the mean difference between students and non-students is somewhat trivial in dollar terms (\$11). Finally, a registered voter could be a proxy for an engaged and socially responsible citizen who is better aware of the need for giving in society. These significant findings are in line with past research by Brooks (2002), Bekkers and Weipking (2011), and Reed and Selbee (2001).

Predictors of giving that were nonsignificant in all of our GLM models included race/ethnicity, sexual orientation, political affiliation, voting status, and age. These findings suggest that holding all other factors constant, some giver characteristics (for example, whether one did or did not vote in 2020 presidential elections) had no statistically significant bearing on giving. It is worth pointing out the reason for differences in the significance pattern between our multivariate and bivariate results. The bivariate results in Table 5 are based on the relationship of each individual predictor with the giving outcome and thus do not account for potential correlation among predictors. For instance, we observe significant individual effects of both marital status and income on giving,  $p < .001$ . However, this could be potentially due to an association between the two predictors: for example, if high income individuals tend to also be married then it leads to the apparent (and potentially incorrect) conclusion that (a) married individuals give more, and (b) high income individuals give more. The non-observance of unmarried high-income givers in the sample can give rise to potential confounding effects, i.e., makes it difficult to see the effect of income on giving while holding the effect of marital status constant and the effect of marital status on giving while holding the effect of income constant. The GLM model (Table 4) fixes this issue and allows one to estimate adjusted effects. Thus, simultaneous observations of a significant effect of income and an insignificant effect of marital status suggest that if married and unmarried individuals had the same level of income then, on average, the two marital status groups would give the same. On the other hand, if two givers had the same marital status but different income levels, then on average their giving would be significantly different. The bottom line here is that while the bivariate results serve the useful initial purpose of providing justification for including predictors in our empirical model, the multivariate results provide a more accurate picture of these predictors on giving.

The multivariate results essentially allow us to interpret the effect of each individual predictor while (statistically) forcing respondents to become equivalent in all other respects. With this explanation in mind, the insignificant effects observed in Table 4 simply suggest that factors such as race, region, sexual orientation, voting status, etc., by themselves have little bearing on giving in our target population. Thus, demographic differences such as whether a giver is registered to vote or not, is of Hispanic origin or not, lives in the southern US or the western US, etc., have no statistically significant effect on giving. Although nonsignificant, these findings are still important in fundraising contexts where the objective is targeted marketing to potential donors.

Results from our binary logistic regression model supported the significant effect of religiosity on giving. Specifically, our results suggested that after controlling for demographic factors, the odds of giving increased by 2.4 in response to a one unit increase in religiosity,  $p < .001$  (95% CI: [2.00, 2.87]). The corresponding change in odds for uncertainty intolerance was not statistically significant,  $OR = 0.90$ ,  $p = .174$  (95% CI: [0.77, 1.05]). This model correctly predicted giving status for nine out of ten givers in our sample (True positive rate, 92.6%).

Mediation results supporting are presented in Table 6. The direct and total effects were almost identical in this model (see Figure 3) with the percentage of mediation being less than 1% (Table 6, panel a). Thus, there was no support for the mediation hypothesis. The results did, however, indicate that religiosity had a highly significant and positive association with uncertainty intolerance,  $p < .001$ . Thus, higher levels of religiosity tend to go hand in hand with higher levels of uncertainty intolerance.

**Table 6.** Results from the mediation model predicting *Giving* from *Religiosity* with *Uncertainty Intolerance* as the mediator

(a) Mediation estimates										
				95% CI						
Effect	Label	Estimate	SE	Lower	Upper	Z	p	% Mediation		
Indirect	a × b	~0	~0	-0.01	0.01	0.37	.714	0.7		
Direct	c	0.19	0.03	0.13	0.24	6.76	< .001	99.3		
Total	c + a × b	0.19	0.03	0.13	0.24	6.86	< .001	100.0		

(b) Path estimates									
						95% CI			
Path			Label	Estimate	SE	Lower	Upper	Z	p
Religiosity	→	Uncertainty	a	0.13	0.03	0.07	0.18	4.53	< .001
Uncertainty	→	Ln(Giving)	b	0.01	0.03	-0.04	0.06	0.37	.713
Religiosity	→	Ln(Giving)	c	0.19	0.03	0.13	0.24	6.76	< .001

Note.  $n = 1,293$ .  $SE$  = standard error.  $CI$  = confidence interval.  $Z$  = observed value of the test statistic.  $p = p$  value.  $\sim 0$  means approximately zero. All variables used in this analysis were purified by partialing out the effects of all demographic factors.

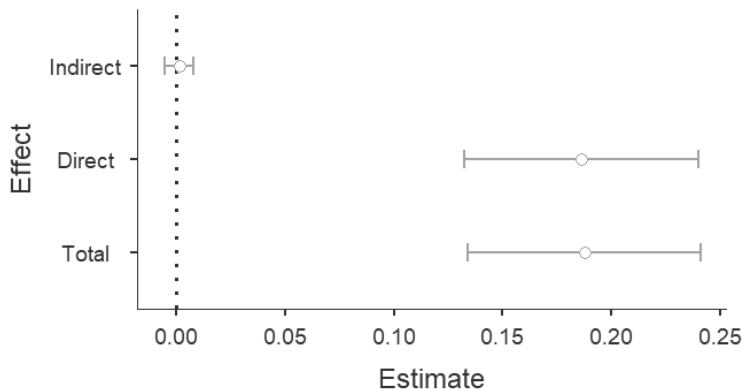


Figure 3. The direct and indirect effects of *Religiosity* on *Giving*,  $n = 1,293$ .

### Discussion and Conclusions

Prior research suggests that giving behavior and attitude towards giving can change during times of uncertainty. This makes it important to understand the dynamics of giving and perceptions of donors during such events. In this study we examine the role of uncertainty intolerance in the relationship between religiosity and giving. We explored two competing hypotheses with uncertainty intolerance playing the roles of mediator and moderator in this relationship. Although our empirical results suggest that both of these roles were statistically not significant, we did find a very strong and robust effect of religiosity on giving. Our statistical results revealed several important findings.

First, our main finding is that perceptions about uncertainty did not affect giving in 2020 when the US was going through the COVID-19 crisis. Thus, in the US, giving is robust and remained stable during the pandemic-related uncertainty. This finding held across religious denominations but varied across several demographic characteristics. And second, although uncertainty perception did not affect giving, religiosity did. The effect of religiosity on giving was universally large and significant in all of our empirical models, reinforcing the importance of this variable in the area of philanthropy. Thus, no charitable organization should ignore this important factor when designing fundraising

campaigns and identifying target audience, especially during times of uncertainty and economic instability when people are less likely to give.

Taken together, these two findings provide an interesting picture of the dynamic relationship between uncertainty intolerance, religiosity, and giving. Uncertainty intolerance by itself is not a significant predictor of giving but that may be due to such intolerance affecting religiosity, which in turn has a strong influence on giving. Since the association between uncertainty intolerance and religiosity is supported by both the correlation analysis reported in Table 3 as well as the mediation results discussed later in this section, this means that, in other words, religiosity has the potential to support philanthropic behavior during times of personal and global crises. The practical implication for nonprofit organizations is that they can counter a potential reduction in giving during times of economic and social uncertainty by effective engagement with religious institutions and communities. The increase in giving due to religiosity during an uncertain time can thus cancel out the decrease in giving due to risk aversion during the same period.

Third, our results support a positive association between uncertainty intolerance and religiosity. The observation that high levels of religiosity go hand-in-hand with high levels of uncertainty intolerance at first may sound counterintuitive but makes better sense if one stops thinking of religiosity as a predictor of uncertainty intolerance. In our mediation analysis, we did treat uncertainty intolerance as an intermediate predictor but that does not preclude reverse causation. It is certainly possible that a person's high level of uncertainty intolerance actually leads to a higher level of religiosity for that person, which then in turn positively affects giving. An examination of this reverse relationship was not an objective of this study and is beyond its stated scope but can certainly be explored by future research. A theoretically important implication of this finding is that if the said bidirectional relationship exists, then it challenges the findings of past research, which either did not investigate the interactive effect of these predictors (e.g. Rehman et al., 2021) or assumed a simpler one-way causal relationship (e.g. Bardeen & Michel, 2017). Like many bidirectional relationships observed in the social sciences, there may even be a feedback loop at play here where uncertainty intolerance during a time of crisis leads to higher religiosity, and in turn higher religiosity improves uncertainty tolerance, which then feed back into religiosity. The occurrence of such a negative feedback loop is of course speculation for now and can be the focus of a dedicated future study on this topic.

From a practical point-of-view, this potential bidirectional relationship between religiosity and uncertainty intolerance provides religious and nonprofit institutions with an additional avenue to increase giving by focusing on providing religious and emotional support and by directing marketing/fundraising efforts toward demographic groups that are the most vulnerable to various dimensions of uncertainty (such as economic, political, social, etc.), as the improvement in religiosity due to such support has a direct positive influence on giving.

To summarize, the main theoretical contribution of this study is that both uncertainty intolerance and religiosity are important for giving. Uncertainty intolerance has a significant relationship with religiosity, and religiosity in turn has a significant relationship with giving. There is a complex interplay among these three variables, which makes it important to study all three variables simultaneously using advanced statistical modeling techniques. The study's main practical contribution is that nonprofits have a way of countering the decrease in giving during uncertain times by appealing to the religious sentiments of donors, especially those who have the tendency to turn toward organized religion during times of crises.

### **Limitations**

The usual limitations that affect secondary datasets apply to our study. These include (a) our reliance on responses whose accuracy cannot be verified, although it is difficult to imagine some form of collusion when so many respondents are involved (see Bekkers and Weipking [2010]); (b) caution should be taken when generalizing the study's results to non-US populations or specific religious subgroups as results can vary (e.g., see Carabain & Bekkers, 2012); (c) our results are a function of variables included in this study as well as the way they are defined; (d) the Muslim demographic was over-sampled in our survey; and (e) the observational nature of this study means that relationships explored in our models cannot be guaranteed to be causal.

The most important limitation of the study is that Muslim Americans are overrepresented in our sample, which means that our results may not be generalizable across the board to other religious traditions. Such overrepresentation was important during data collection in order to avoid the statistical issue of zero or small cell sizes (i.e., subgroups within the original sample). Given that Muslim Americans represent only a tiny fraction (< 2%) of the US population, a fully representative general population sample with adequate Muslim American subgroup sizes would have been very large (tens of thousands of participants). The practice of oversampling is common in survey research and for a technical overview of this technique within a social science context, see Kalton (2009).

In order to address this issue, starting in 2022, the Charitable Giving survey started utilizing separate samples for Muslim Americans and the general population. Thus, in these surveys the Muslim American sample ( $n \sim 1,000$ ) allows analysis with sufficient subgroup sizes while the sample representing the general population ( $n \sim 1,000$ ) allows hypothesis testing across all religious traditions. However, the latter sample includes a very small number of Muslims ( $n \sim 20$ ), which is too small to be used for Muslim-specific research questions. These post-2021 surveys would have been great from a statistical point of view, but they were all administered after the COVID-19 pandemic and for this reason cannot be used in our study.

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