Believing, Bonding, Behaving, and Belonging: The Cognitive, Emotional, Moral, and Social Dimensions of Religiousness across Cultures

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Believing, Bonding, Behaving, and Belonging: The Cognitive, Emotional, Moral, and Social

Dimensions of Religiousness across Cultures

Abstract

Based on theorization on the four basic dimensions of religiousness, *Believing, Bonding, Behaving*, and *Belonging*, and corresponding cognitive, emotional, moral, and social motives and functions of religion (Saroglou, 2011), we developed a measure and investigated cross-cultural consistency of the four dimensions as well interindividual and cross-cultural variability. Data were collected from 15 countries varying in religious heritage: Catholicism, Protestantism, Christian Orthodoxy, Judaism, Islam, and Buddhism/Taoism ($N = 3,218$). Beyond their high interrelation and common personality correlates (agreeableness and conscientiousness) due to the underlying global religiosity, the four dimensions were distinct across cultures and religions, less interrelated in Eastern Asia compared to the West, differentially preferred across cultural zones, and characterized by distinct features. Believing and bonding were related to spirituality and were preferred in Western secular societies. Behaving and belonging were related to fundamentalism, need for closure, and low openness, and were not disfavored in more religious societies. Furthermore, bonding, belonging, and behaving predicted increased life satisfaction through, respectively, agreeableness, extraversion, and low existential quest, whereas believing predicted decreased life satisfaction through high existential quest. Thus, the multidimensionality of religiousness seems deeply rooted in distinct psychological dispositions attestable at both the individual and the cultural levels.

Keywords

Religious Dimensions, Big Five Personality Traits, Cross-Cultural Differences, Life Satisfaction, Closed-Mindedness

Believing, Bonding, Behaving, and Belonging: The Cognitive, Emotional, Moral, and Social

Dimensions of Religiousness across Cultures

Religiousness can be conceived as a global orientation of overall positive versus

negative--or indifferent--attitudes regarding religion. Global religiousness predicts many

psychological outcomes at the intraindividual, interpersonal, and intergroup levels, especially

if the key comparison is between believers and non-believers (Tsang & McCullough, 2003).

These outcomes are often similar across cultures (Saroglou & Cohen, 2013).

However, one must also acknowledge multidimensionality in religiousness and

interindividual and cross-cultural variation in religious forms (Hill, 2013; Saroglou & Cohen,

2013). For instance, religiosity can be intrinsic or extrinsic in the underlying motivations,

valuing doubt or fundamentalist, inclusive or exclusive of others, and colored by positive or

negative emotionality. At the cultural level too, some groups are more strongly characterized

by, for instance, intrinsic versus extrinsic (Cohen, Gorvine, & Gorvine, 2013), or inclusive

versus exclusive (Clobert, Saroglou, & Hwang, 2017) religiosity. Typically, religiosity that is

intrinsic, questing, inclusive, and of positive emotionality is considered as positive and

mature. The opposite kinds of religiosity usually predict negative outcomes.

We argue that beyond such variability that distinguishes between positive and negative

forms of religiosity, researchers should also be interested in a more basic distinction between

four dimensions of religiosity: believing, bonding, behaving, and belonging. These

dimensions reflect different in *nature* (cognitive, emotional, moral, and social), and not in

quality (positive versus negative), motives and processes. The present work focuses on this

distinction, its measurement, and interindividual and cultural variability.

Four Basic Religious Dimensions: Believing, Bonding, Behaving, and Belonging

These four dimensions reflecting the cognitive, emotional, moral, and social aspects of

religiousness are facets of the same global religiosity, but it is psychologically relevant to also

consider their distinctiveness. Integrating and extending previous theory (Glock, 1962; see also Atran & Norenzayan, 2004; Hervieu-Léger, 1999; Hinde 1999), Saroglou (2011) developed theorization where religion and religiousness are defined as including four basic dimensions, named, for convenience, as *Believing*, *Bonding*, *Behaving*, and *Belonging*. According to this theorization, the co-existence of the four dimensions within religion makes religion unique with regard to proximal domains such as art, paranormal beliefs, non-organized spirituality, or ideology. However, these dimensions should also reflect distinct psychological characteristics and imply interindividual and cross-cultural variability.

Each of these dimensions corresponds to a specific aspect of religion, kinds of religious products, and underlying ideals; as well as specific motives to become, continue, or stop being religious, different ways to express religiousness, and distinct functions of religion. The *believing* dimension refers to the cognitive aspects of religion, beliefs related to the transcendence, the ideal of truth, especially regarding the big existential questions, and motives and functions such as search for meaning and epistemic certainty. The *bonding* dimension refers to the emotional aspects involved in the connection with the transcendence and the co-religionists through religious rituals; search for oneness, awe, and inner peace; and motives and functions such as emotional regulation and attachment security. The *behaving* dimension refers to the moral aspect of religion implying norms and moral rules; ideals of virtue, purity, and moral order; and search for self-control and a values hierarchy. Finally, the *belonging* dimension refers to the social aspects of religion, insertion into a community, continuity with a tradition, and the search for collective identity and social self-esteem by belonging to a group with a glorious past and an eternal future.

Theoretically, these four dimensions not only detail *how* and *why* people *are* religious, but also how and why people *become* religious (see for conversion motives: Rambo & Farhadian, 2014), or *exit from* religion (see for deconversion motives: Streib, Keller, Csöff, &

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Silver, 2008). For instance, nonbelievers may find religious beliefs irrational, religious rituals

unsatisfactory, religious morality hypocritical, and the religious group as inhibiting autonomy

(Saroglou, 2012). Moreover, these four dimensions point to different mechanisms explaining

the religion-well-being link: meaning and purpose in life (Park & Slattery, 2013), positive

emotions experienced in rituals (Van Cappellen, Toth-Gauthier, Saroglou, & Fredrickson,

2016), moral order-related hygienic behaviors (McCullough & Willoughby, 2009), and

identification with and social support from the group (Hayward & Krause, 2013).

Psychological Distinctiveness and Cultural Variability of the Four Religious Dimensions

This work investigates the degree to which the four dimensions are, beyond their

overlap due to the common underlying global religiosity, distinct from each other, and the

extent to which they demonstrate psychologically meaningful variability between individuals,

religions, and cultures. We hypothesized that each dimension would differentially relate to (1)

specific religious orientations, (2) basic personality traits, (3) socio-cognitive orientations, and

(4) well-being. Furthermore, cultural/religious groups may differ (5) in the degree to which

the four dimensions are interrelated and (6) on the relative importance attributed to each of the

four dimensions. To test our hypotheses, we created a measure aiming to tap the four religious

dimensions in the general population and carried out an international study to address the

above questions with samples from 15 countries varying in religious heritage: Catholic, mixed

Protestant/Catholic, Christian Orthodox, Jewish, Muslim, and Buddhist/Taoist.

Measuring the Four Basic Dimensions of Religiousness

We created a brief measure aiming to tap the four basic dimensions of believing,

bonding, behaving, and belonging. The scale's 12 items are provided in Table 1. The items

were created by were created by Western European psychologists in collaboration with

psychologists in the US, all of them familiar with extant measures of religiousness. The items

were intended to be psychological in nature by referring to motives and functions rather than

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to specific religious beliefs and practice. The number of items was limited in order to have a measure that could easily be administered to both religious and non-religious participants, the latter being often reluctant to answer lengthy religious measures. The measure aimed not to exclude nonbelievers, since the various items provided the possibility to eventually express some degree of valuing one or another aspect of religion. Similarly, the religionists can highly endorse some, and not necessarily all, religious dimensions.

Note that our conceptualization departs in several ways from the (sociological) classification of aspects of religiosity into belief, practice, and affiliation (Voas, 2007). In our model, (1) the believing dimension refers not to specific religious beliefs but to religion as meaning and connection with an abstract transcendence, (2) the bonding dimension denotes attachment to emotions and aesthetics and not frequency of religious practice, (3) a moral dimension is added, and (4) the focus is on attachment to a religious heritage and not affiliation with a denomination. These specificities of our conceptualization also apply with regard to the *Centrality of Religiosity Scale* (Huber & Huber, 2012). This 15-item scale aggregates five dimensions, called "ideological" (beliefs), "intellectual" (acquiring religious knowledge), "experiential" (connection with God), public practice (religious attendance), and private practice (prayer). Moreover, our aim is to measure *distinct* types of *psychological motives*, whereas the goal of the *Centrality of Religiosity Scale* is to capture religiosity as the *aggregation* of beliefs, practice, affiliation, and religious knowledge.

Finally, our operationalization of the four religious dimensions intends to be not only religiously "content-free", but also fully descriptive and non-evaluative. Distinguishing between intrinsic versus extrinsic religiosity, religion of a loving versus punishing God, and religion-as-quest versus fundamentalism, presents the risk of some evaluative biases in favor of a "good" versus "bad" religion. Departing from such perspective, we intended to operationalize the four dimensions in a neutral way. We thus measured (1) religion as

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meaning-making, be it in a fundamentalist or symbolic way, (2) religion as an experience

through rituals, replete with positive emotions or not, (3) religion as a set of values and norms,

whether favoring collectivist and "hygienic" morality or promoting care for others and justice,

and (4) religion as attachment to a community, with identity being inclusivist or exclusivist.

Distinct Psychological Characteristics

We expected the four religious dimensions, especially after controlling for the

common variance on general religiosity, to be only moderately inter-related and show

differential associations with two key (quasi)religious orientations--spirituality and

fundamentalism--and key psychological individual differences. The latter included the Big

Five personality traits, subjective and objective indicators of well-being, and three socio-

cognitive orientations denoting rigidity-flexibility in the existential, epistemic, and socio-

political domains, i.e., respectively, existential quest, need for closure, and authoritarianism.

Spirituality and fundamentalism

Before controlling for religiosity, all four dimensions should be importantly related to

spirituality, which typically correlates with religiosity since most religious people consider

spirituality as an important part of their religion (Zinnbauer & Pargament, 2005). However,

after controlling for religiosity, we hypothesized *spirituality* to be primarily associated with

the *believing* and *bonding* dimensions (see also Saroglou, 2011). This is because spirituality,

respectively, (1) is defined by the belief in transcendence and a search for meaning, and (2)

implies a strong experiential dimension, connection with the transcendence, and

interconnectedness with all beings and the world (MacDonald, 2000). The behaving

dimension could be less involved since, unlike religiosity, spirituality reflects a questing

attitude toward existential issues and is not associated with the endorsement of strict and

collectivistic morality (Deak & Saroglou, 2015). Moreover, the belonging dimension should

be unrelated to spirituality, since modern spirituality emphasizes autonomy and individuality

and often indifference toward institutionalized forms of religion (Johnson, Sharp, Okun, Shariff, & Cohen, 2018; Zinnbauer & Pargament, 2005).

Similarly, before controlling for religiosity, our four dimensions should be highly related to *fundamentalism*, which is an authoritarian religiosity (Rowatt, Shen, LaBouff, & Gonzalez, 2013). High versus low fundamentalism, in the general population, maps onto high versus low religiosity, and there exist cognitive, emotional, moral, and social forms of fundamentalism (Saroglou, 2016). As examples, respectively, the meaning-making process is made intra-textually (Hood, Hill, & Williamson, 2005), religious experience is marked by fear and hate (Strozier, Terman, & Jones, 2010), collectivistic and self-control-oriented norms are preferred over prosocial values (Johnson et al., 2016), and ingroup favoritism becomes outgroup derogation (Rowatt et al., 2013). However, because fundamentalism is greatly concerned with moral order, group exclusivity, and social conformity, we expected the *behaving* and *belonging* dimensions to be more strongly related to fundamentalism than the believing and bonding dimensions after controlling for global religiosity.

Big five personality traits

Previous research has shown that religiousness, across its several forms, including fundamentalism and spirituality, is typically, though weakly, related to agreeableness and conscientiousness. Closed-minded forms of religiosity like orthodoxy and fundamentalism, and sometimes traditional religiosity too, are additionally related negatively to openness to experience, whereas spirituality is positively associated with this factor. Overall, religiosity is unrelated to neuroticism and extraversion, though in some cultures it may reflect positive emotionality, i.e. high extraversion and/or low neuroticism (Saroglou, 2010, 2017).

We thus expected all four religious dimensions to relate positively to agreeableness and conscientiousness. It is through beliefs and narratives, experiences in rituals, values and norms, and the formation of a community that religion enhances oneness with (proximal)

others and self-control and life goals to achieve. Similarly, religion attracts people with

prosocial and order-oriented tendencies in the cognitive, emotional, moral, and/or social

domains. Nevertheless, compared to the other three religious dimensions, the *bonding*

dimension, because of its emotional character and the eminently social aspect of the emotions

in collective rituals, should reflect *agreeableness* in a stronger way; and the *behaving*

dimension, as it involves moral clarity and hierarchy between various norms, should be more

clearly related to *conscientiousness*. Moreover, the *behaving* and *belonging* dimensions,

because of the underlying social conformity and attachment to a tradition, should be

negatively related to *openness to experience*. *Extraversion* could be positively related to the

bonding and the *belonging* dimensions, because of their social aspect. Finally, we had no

reason to expect *neuroticism* to particularly relate to any specific religious dimension, because

we had operationalized the measure to tap religious dimensions that neither are colored by a

fundamentalist or liberal tendency, nor denote specifically positive or negative emotionality.

Rigidity versus flexibility: Existential quest, need for closure, and authoritarianism

Religious orthodoxy and fundamentalism typically relate to socio-cognitive

orientations denoting rigidity and closed-mindedness such as low existential quest and high

need for closure, dogmatism, and authoritarianism. In contrast, religious quest, symbolic

belief, and modern spirituality, are either unrelated to the above constructs or related to them

in the opposite direction from orthodoxy or fundamentalism (Rowatt et al., 2013).

What about mere religiosity, i.e. the common believing and practicing of most

believers, who are neither dogmatic nor social rebels? Research in Western societies indicates

that common religiosity reflects need for closure, i.e. epistemic motivation for answers and a

search for order and predictability in one's own internal and external world (Duriez, 2003).

Similarly, common religiosity is often related to authoritarianism, though to a lesser extent

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than fundamentalism (Wink, Dillon, & Prettyman, 2007), and is not accompanied by high

existential quest (Deak & Saroglou, 2015; Van Pachterbeke, Keller, & Saroglou, 2012).

Thus, we expected all four dimensions, because of the underlying global religiosity, to

denote low flexibility in the existential domain (not highly valuing doubt and openness to the

possibility of changing beliefs in the future), the epistemic domain (need for closure, in terms

of order and predictability), and the sociopolitical orientation of authoritarianism. However,

after controlling for global religiosity, we expected the *behaving* and *belonging* dimensions to

be associated with low existential quest and high need for closure and authoritarianism.

Indicators of well-being

We also investigated whether the four religious dimensions differentially predict well-

being. We used two indicators, one more subjective, life satisfaction, and the other, somewhat

more objective, frequency of medical visits. In principle, all four religious dimensions could

contribute to well-being. As previously mentioned, the link between religiousness and well-

being can be at least partly explained by religious beliefs, emotional experience in rituals,

self-control-oriented "hygienic" practices, and group-based factors (Park & Slattery, 2013).

However, the *belonging* and the *bonding* dimensions of religiousness may have a

major role given their direct influences on well-being through respectively, social support and

social identity (Hayward & Krause, 2014), and experience of and regulation of emotions

(Park & Slattery, 2013). The influences of the behaving and the believing dimensions may be

less obvious because it is unclear whether (high) clarity and certainty in existential beliefs and

normative practices is associated with well-being (Napier & Jost, 2008) or with high anxiety

(Lewis & Loewenthal, 2018). Finally, in line with the idea that the religiosity-well-being links

can be partly explained by the underlying personality traits (McCullough & Willoughby,

2009), we investigated possible differential pathways from the four religious dimensions to

well-being through the respective different personality characteristics.

Cross-Cultural/Religious Variation

Based on previous theorization having identified these four aspects (beliefs, emotions

in rituals, values, and community) across religions (Glock, 1962; see also Atran &

Norenzayan, 2004; Hinde, 1999), as well as emerging research indicating similar functions of

religiousness across cultural contexts (Saroglou & Cohen, 2013), we first expected the four

dimensions to be identifiable across religions and countries (see also Saroglou, 2011).

Furthermore, beyond their universality, the four dimensions should allow us to identify

meaningful and interesting cross-cultural/religious differences. Religious cultures should

differ (1) in the degree to which the four dimensions are interrelated and (2) in the relative

importance they attach to the four dimensions.

Degree of interrelations between the religious dimensions across cultures

The different aspects of religion seem to be more integrated in Western monotheistic

contexts compared to Eastern Asian contexts (Saroglou, 2011). Eastern religions, compared to

the monotheisms, imply a weaker connection between a personal god and moral order (Stark,

2001). The search for personal control is less relevant in Eastern Asian religious contexts,

compared to what is the case among Western Christians (Sasaki & Kim, 2011). Similarly,

Eastern Asian religiosity, compared to Christian religiosity, predicts tolerance rather than

prejudice of ethnic and religious outgroups and this is because of Easterners' higher tolerance

of contradiction (Clobert et al., 2017). Thus, we hypothesized that the interrelations between

the four dimensions should be weaker in a cultural context marked by Buddhism/Taoism (in

this study, Taiwan) compared to Western societies marked by monotheistic religions.

Differences in the relative importance of the four dimensions across cultures

An interesting source of cross-cultural variance should be the emphasis that a specific

religious culture gives to one or the other religious dimension (Saroglou, 2011). First,

Protestantism in the West strongly accentuates the importance of faith, belief, and meaning-

making, assumed to be at the heart of intrinsic religiosity (Cohen, Hall, Koenig, & Meador, 2005). We thus expected the *believing* dimension to be preponderant in countries of Protestant tradition, including ones with mixed Catholic and Protestant influences. Second, because of the importance of rituals in connecting people, the *bonding* dimension should be preponderant in contexts emphasizing the role of collective rituals in maintaining tradition and culture, such as Judaism and Christian Orthodoxy, which emphasize orthopraxy (Cohen et al., 2013; Roudometov, 2010). Moreover, because of its emphasis on emotions, the bonding dimension should be strong in cultural contexts valuing religious individual experience and favoring charismatic religious forms (e.g., US). Third, a major specificity of Islam across countries, compared to other religious civilizational zones, is its emphasis on traditional morality (Norris & Inglehart, 2004). We thus expected the *behaving* dimension to be preponderant in a Muslim cultural context (here, Turkey). Finally, given the significant role of religion with respect to the ethnic identity in some nations for historical and geographical reasons (Saroglou, 2017), we expected the *belonging* dimension to be preponderant in Israel and Greece.

Summary of the Expectations

Four religious dimensions, i.e. believing, bonding, behaving, and belonging, denoting, respectively, the cognitive, emotional, moral, and social aspects of religiousness, would be distinct and explain interindividual and cultural variability overall and above a unidimensional conception of religiosity. We expected that: (1) the four-factor structure of the scale we created to measure the four dimensions would be observable across individuals and countries (here: 15 countries, six religious traditions); (2) the four dimensions would be less interrelated and less strongly related to other religious measures--spirituality and fundamentalism--after controlling for general religiosity; (3) the believing and bonding dimensions would characterize spirituality, especially in secular contexts, and (4) all dimensions would contribute to fundamentalism, but in particular the behaving and belonging dimensions.

Further, we expected agreeableness and conscientiousness to be positively associated

with all dimensions, but more clearly (5) agreeableness, to the bonding dimension, (6)

conscientiousness, to the behaving dimension, and (7) extraversion, to the bonding and

belonging dimensions. Moreover, though all four dimensions should reflect order-oriented

socio-cognitive orientations (low existential quest and high need for closure and

authoritarianism), we expected (8) the behaving and belonging dimensions to most clearly

reflect these socio-cognitive orientations and low openness to experience. Further, (9) all four

dimensions should be associated with well-being, particularly the bonding and belonging

dimensions, and (10) these links would be partly mediated by respective personality traits.

Finally, we expected cross-cultural differences, that is: (11) the four dimensions would

be more strongly interrelated in Western monotheistic compared to East Asian contexts; and

(12a) believing would be predominant in Protestantism, (12b) bonding in the US, (12c)

bonding and belonging in Christian Orthodoxy and Judaism, and (12d) behaving in Islam.

Method

Participants

In total, 3,218 participants (*M*age = 21.82, *SD* = 4.95, 70.8% female), all students,

mostly in the humanities and social sciences, from 15 different countries or states (hereafter:

countries) took part voluntarily in the study. The countries included were Belgium (BE),

Costa Rica (CR), France (FR), Germany (DE), Greece (GR), Israel (IL), Italy (IT)*,* Poland

(PL), Slovakia (SK), Spain (ES), Switzerland (CH), USA-Arizona (US-AZ), USA-Indiana

(US-IN), Turkey (TK), and Taiwan (TW). The sample sizes, by country, and demographics

are detailed in Supplementary Material Table 1. Following the general recommendations

made by Wolf and colleagues (Wolf, Harrington, Clark, & Miller, 2013) regarding the sample

size requirements for CFAs, we estimated that a sample size of 150 participants per country

was necessary to evaluate a four-factor model with three indicators per factor (with loadings

set at .80) to obtain statistical power at the recommended .80 level (Cohen, 1988). In all but

one country, the sample size varied from 150 to 271 (500 in Spain).

Measures

The Four Basic Dimensions of Religiousness scale

Participants completed the 12-item scale designed to measure four distinct dimensions

of religiousness, with three items per dimension (see Table 1). The scale measures positive

attitudes toward and endorsement of (interest on, attachment to, investment on, valuing) (1)

religious meaning-beliefs, i.e. the Believing dimension (αs ranging from .772 to .914 across

countries), (2) religious ritual-emotions, i.e. the Bonding dimension (αs ranging from .727

to .940), (3) religious morality-norms, i.e. the Behaving dimension (αs ranging from .787

to .946), and (4) religious community-tradition, i.e. the Belonging dimension (αs ranging

from .714 to .924). Participants rated on a 7-point Likert scale their agreement (from 1 =

totally disagree to 7 = *totally agree*) with each item.[1]

Religiosity, spirituality, and fundamentalism

We provided participants with a widely used three-item index of general, personal

religiosity (7-point Likert scales) measuring the importance of God in life, the importance of

religion in life, and the frequency of prayer (across countries, αs ranged from .80 to .95), and

a one-item index of the importance of *spirituality* in their life (7-point Likert scale). *Religious*

fundamentalism was measured using the short, 12-item, form of the widely used scale of

Altemeyer and Hunsberger (2004) (αs ranged from .75 to .95 across countries).

Personality and well-being

The Ten-Item Personality Inventory (Gosling, Rentfrow, & Swann, 2003) was used to

measure the *Big Five personality traits*: extraversion, agreeableness, conscientiousness,

neuroticism, and openness to experience. As *indicators of well-being*, we used the Satisfaction

with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), of five items and a 7-point Likert

format (αs ranging from .78 to .87 across countries), as well as the number of visits to a

doctor over the past year (from 1 = *none* to 5 = *a lot*).

Socio-cognitive orientations

Participants completed measures of *existential quest*, *need for closure*, and

authoritarianism. To measure flexibility on one's own attitudes toward existential issues, i.e.

valuing doubt and being open to the possibility of change one's own beliefs, we used the 9-

item Existential Quest Scale (Van Pachterbeke et al., 2012) (αs ranged from .64 to .82 across

countries). To measure the epistemic need for order and structure in the internal world and for

"an answer on a given topic, any answer … compared to confusion and ambiguity", we used

nine items from the need for order and need for predictability subscales of the Need for

Closure Scale (Webster & Kruglanski, 1994) (αs ranged from .57 to .84 across countries).

These two facets are known to constitute the most representative dimensions of the construct

and clearly relate to religiosity per se, not necessarily a rigid one (Duriez, 2003). Finally, we

administered 12 items from the Right-Wing Authoritarianism scale (Funke's, 2005, adapted

here for the international context) comprising the three authoritarian dimensions of

conventionalism, submission, and aggression (αs ranged from .52 to .73 across countries).

Results

Factorial Structure and Convergent Validity

To confirm the distinctiveness of the four hypothesized religious dimensions, two

confirmatory factor analyses (CFAs) that compared the fit of two nested models were

conducted using AMOS, version 20. The first model was a single factor model in which all

items included in the scale contributed to a single underlying factor, i.e. religiousness. The

second model was a four-factor model corresponding to the four dimensions of religiousness

theorized. Parameters were estimated by using maximum likelihood. To account for the

nested structure of the data, we run multi-group CFAs (unconstrained model). Finally, we

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conducted a chi-square difference test and compared the Akaike information criterion (AIC)

values (Bollen, 1989) to determine whether the two models were significantly different.

The four-factor model (Supplementary Material, Figure 1) provided an acceptable to

good fit (*RMSEA* = .026, *CFI* = .952, *IFI* = .953, *NFI* = .932), while the one-factor solution

presented a relatively poor fit to the data, according to the usual indices (*RMSEA* = .043, *CFI*

= .854, *IFI* = .856, *NFI* = .835). A significant difference between the chi-square for each

model indicated that the four-factor model was significantly better than the one-factor model:

four-factor model, $\chi^2(720, N = 3218) = 2264.939$; one-factor model, $\chi^2(810, N = 3218) =$

5519.660; $\Delta\chi^2 = 3254.721$, $\Delta df = 90$, $p < .001$. The four-factor model also had a much smaller

AIC value (3524.939) than the one-factor model (6599.660). Thus, overall, the four-factor

model provided a better fit for the data than the single factor solution suggesting that the Four

Basic Dimensions of Religiousness Scale measures well four components of religiousness.

Moreover, to ensure that the four dimensions items capture well the breath of global

personal religiosity, we specified in AMOS (version 20) a hierarchical model (see Supplement

Material, Figure 2) accounting for the nested structure of the data in which the four

dimensions captured by the scale's items serve as an indicator of one global latent variable

(G-factor). Another latent variable representing global religiosity as captured by the three-

item index of religiosity was then added in the model. The latent correlation between the

latent G-factor and global religiosity was therefore computed. The specified model

(unconstrained) presented a good fit to the data, $\chi^2 = 3107.994$, $df = 1120$, *RMSEA* = .024, *CI*

= [.023-.025], *CFI* = .952, *IFI* = .952, *NFI* = .927, and revealed a mean correlation across

groups (weighted for sample size) of $r = .898$, $p < .001$, $CI = [.886, .909]$, between our latent

variables suggesting that the two constructs can be regarded as indistinguishable ($> r = .80$).

These results suggest that the hypothesized four factors capture well the breath of religiosity.

Cross-Cultural/Religious Measurement Equivalence

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To ensure that the model described above was equivalent across countries and individuals' religious affiliations, multi-group Confirmatory Factor Analyses (CFAs) using AMOS v. 20, were conducted. We followed the analytical strategy described by Cheung and Rensvold (2002) and compared between an unconstrained model and a model constrained to present equal structural weights: (1) across the 15 countries/states varying in religious heritage, i.e. BE, CR, FR, IT, PL, SK, ES (Catholic tradition), DE, CH, US-AZ, US-IN (mixed Catholic and Protestant tradition), GR (Christian Orthodox tradition), IL (Jewish tradition, TK (Islamic tradition), and TW (Eastern religious traditions; and (2) across convictional affiliations of participants: Catholics, Protestants, Jewish, Muslims, Orthodox, Buddhists/Taoists, agnostics, atheists, and "others".

The multigroup CFAs for the 15 countries showed that the fit indices for the unconstrained model, $\chi^2 = 2264.939$, $df = 720$, $p < .001$; $CFI = .952$, $RMSEA = .026$, McDonald's $NCI = .786$, $Gamma\ Hat = .998$, were overall comparable to those obtained for the model constrained to present equal structural weights, $\chi^2 = 2582.693$, $df = 832$, $p < .001$; $CFI = .946$, $RMSEA = .026$, McDonald's $NCI = .762$, $Gamma\ Hat = .998$. The difference between the constrained and unconstrained model was not significant according to most indexes [$\Delta CFI = -.006$ (difference $< .01$), $\Delta RMSEA = .000$ (difference $< .01$), ΔMcDonald's $NCI = -.02$ (difference $< -.02$), $\Delta Gamma\ Hat = .000$ (difference $< -.005$], except for the Chi-square test ($\Delta\chi^2 = 317.754$, $\Delta df = 112$, $p < .001$). Thus, the Four Basic Dimensions of Religiousness Scale shows dimensional invariance (four factors) and configural invariance (items' correspondence with the appropriate factor) across the 15 countries.

The multi-group CFAs for the different convictional affiliations of participants showed that the fit indices for the unconstrained model, $\chi^2 = 1773.588$, $df = 432$, $p < .001$; $CFI = .946$, $RMSEA = .032$, McDonald's $NCI = .798$, $Gamma\ Hat = .998$, and for the model constrained to present equal structural weights, $\chi^2 = 2033.424$, $df = 496$, $p < .001$; $CFI = .938$, $RMSEA$

= .032, McDonald's *NCI* = .774, *Gamma Hat* = .997, were quite similar. The difference

between the constrained and unconstrained model was not significant: ΔCFI = -.008

(difference < .01), $\Delta RMSEA$ = .000 (difference < .01), ΔMcDonald's *NCI* = -.02 (difference <

-.02), $\Delta Gamma\ Hat$ = -.001 (difference < -.005), except for the Chi-square difference ($\Delta\chi^2$ =

259.836, Δdf =64, *p* < .001). Multi-group CFA analyses therefore showed the structural

(dimensional and configural) equivalence of the Four Basic Dimensions of Religiousness

Scale across religious/convictional groups.[2]

Correlations Between the Religious Measures across Cultures

We subsequently examined the intercorrelations between the four dimensions as well

as the correlations between the four dimensions and the three other religious measures, i.e.

religiosity, fundamentalism, and spirituality. To account for the nested structure of the data,

instead of simple correlations we computed the mean of correlations across countries

weighted by the sample size (for such an approach, see Gebauer, Sedikides, & Schrade,

2017). The four dimensions were highly intercorrelated, with coefficients of intercorrelations

ranging from .67 to .81 in the total sample (see Table 2), obviously because of the common

underlying religiosity distinguishing between believers and non-believers in the total

population. When controlling for religiosity, the coefficients decreased and varied from .37

to .54 (see also Table 3). Similarly, all four dimensions were highly related to the general

index of religiosity and importantly to spirituality and fundamentalism. However, when

controlling for religiosity, spirituality was almost unrelated to the behaving and belonging

dimensions (.06 and .05) and weakly related to the believing and bonding ones (.16 and .12).

Fundamentalism was related weakly to the bonding and belonging dimensions (.12 and .18)

and moderately to the believing and behaving ones (.23 and .25) (see also Table 2).

To test the hypotheses that the degree of intercorrelations between the four

dimensions, as well of their relationship with the other three religious measures, would be

moderated by the monotheistic versus non-monotheistic character of the country's religious

tradition and by the religious versus secular character of the country, we created three cultural

groups: (1) the religious countries (of various religious monotheistic traditions), i.e. CR, GR,

IL, IT, PL, SK, TK, and the US; (2) the secular Western European countries, all of Catholic

tradition, i.e. BE, ES, and FR, or mixed Protestant-Catholic tradition, i.e. CH and DE); and (3)

Taiwan, a country of Eastern (Buddhist/Taoist) religious tradition.

To check whether significant differences exist between these three cultural groups, we

ran multi-group CFAs in which we compared an unconstrained model to a model constraining

all correlations to be equal across groups (see Supplement Material, Figure 3). Compared to

the unconstrained model, $\chi^2 = 5989.629$, $df = 990$, $p < .001$; $CFI = .926$, $RMSEA = .040$,

$McDonnald's\ NCI = .460$, $Gamma\ Hat = .989$, the model constrained to present equal

structural correlations, $\chi^2 = 8830.565$, $df = 1144$, $p < .001$; $CFI = .887$, $RMSEA = .046$,

$McDonnald's\ NCI = .303$, $Gamma\ Hat = .970$, presented a worse fit to the data, $\Delta\chi^2 =$

2840.936, $\Delta df = 154$, $p < .001$, $\Delta CFI = -.039$ (difference $> .01$), $\Delta RMSEA = .006$ (difference

$< .01$), $\Delta McDonnald's\ NCI = -.157$ (difference $> -.02$), $\Delta Gamma\ Hat = -.019$ (difference $>$

$-.005$). Thus, the intercorrelations between the four dimensions as well as their relationships

with other religious measures varied significantly across groups.

The subsequent correlations, distinct by cultural group (see Supplementary Material,

Table 2), showed that the four religious dimensions were importantly interrelated with each

other and with religiosity and spirituality in both the religious and the secular countries of

monotheistic traditions, but did it only moderately in Taiwan. When controlling for global

religiosity, all the inter-religious associations decreased in size and the above-mentioned

differences between the cultural zones were clearly observed. These analyses also revealed

that, in (religious or secular) countries of monotheistic tradition, spirituality is rather related to

the believing and the bonding dimensions and not to the behaving and the belonging ones (but

relates, like religiosity, to all four dimensions in Taiwan). Moreover, fundamentalism relates

to all four dimensions in the religious countries of monotheistic tradition, to the three

dimensions but not to the bonding dimension in the secularized countries, and to the

belonging one but negatively to the bonding one in East Asia (Taiwan).

Mean Differences by Cultural/Religious Zone

We distinguished, across the 15 countries, seven cultural zones: religious Catholic

countries (CR, IT, PL, SK), secular Western European countries (BE, FR, DE, ES, CH; all of

Catholic or mixed Protestant-Catholic tradition), USA (predominantly Protestant but also

Catholic), Greece (Christian Orthodox), Israel (Jewish), Turkey (Muslim), and Taiwan

(Buddhism/Taoism). To test for significant differences between the four religious dimensions

within each cultural-religious zone, we computed for each zone a repeated measure ANOVA

analysis and subsequent paired t-tests when the results were significant.

Means of the four religious dimensions by cultural zone, as well as the *Fs*, *dfs*, and η^2s

of the ANOVAs, are detailed in Table 3 (see also Figure 1). In all cultural zones, the ANOVA

results were significant, as well many of the subsequent paired t-tests (see detailed statistical

information in Supplementary Material, Table 3).

Specifically, in the *secularized Western European* countries, believing and bonding

were evaluated higher than the behaving and the belonging dimensions. The behaving

dimension was even lower than the belonging dimension. In the *religious Catholic* countries,

the believing dimension was higher than the bonding and behaving dimensions, which in turn

were higher than the belonging dimension. Similarly, in *Greece*, believing was more

important than bonding, which in turn was higher than the belonging dimension; the behaving

dimension was in the middle, not differing from the believing and the bonding dimensions.

In *Israel*, the bonding dimension was the highest compared to the other three, which

did not differ with each other on importance. In *the US*, the bonding dimension was of slightly

higher importance compared to the behaving dimension, which in turn was higher than the

belonging dimension; the believing dimension located between, not differing from, the

bonding and the behaving dimensions. In *Turkey*, the behaving dimension was scored the

highest, being thus higher than the believing dimension, which in turn was higher than the

bonding dimension, followed by the lowest belonging dimension. Finally, in *Taiwan*, the

believing and bonding dimensions were invested to a more important degree than the

behaving and belonging dimensions, with the latest one being lower than behaving.

In sum, belonging was the lowest in almost all zones. Bonding was the highest in

Israel, whereas behaving was the highest in Turkey. In the religious Catholic countries, the

US, and Greece, with slight differences in the rank order, believing, bonding, and behaving

were overall equally valued, more than the belonging dimension. In secular Europe and

Taiwan, the believing and bonding dimensions were more valued than the other two

dimensions, with the behaving being slightly preferred over the belonging in Taiwan, whereas

the opposite being the case in secular Europe. [3]

Relationships with Relevant Psychological Constructs

To examine possible similarities and differences between the four religious

dimensions in their psychological characteristics (personality traits, socio-cognitive

orientations, and indicators of well-being), we first computed correlational analyses, in which

we also included, for comparison reasons, global religiosity and the index of spirituality.

Mean correlations across countries weighted by sample size were used to account for the

hierarchical structure of the data. Second, we investigated, using Generalized Structural

Equation Modeling (accounting for the nested structure of the data) including the random

effect of country, the unique relations of each religious dimension with the above variables

while controlling for the other ones. Third, we investigated whether relevant personality

characteristics can mediate the links between the religious dimensions and well-being.

Correlations between the religious dimensions and psychological constructs

All six religious measures were positively associated with *agreeableness*, *conscientiousness*, and certainty- and order-related socio-cognitive orientations in the existential (low *existential quest*), epistemic (high *need for closure*), and sociopolitical (high *right-wing authoritarianism*) domains (see Table 4). Religiosity and spiritualty were related to high *extraversion*, which was also characteristic of the belonging dimension. *Neuroticism* was unrelated to any religious measure. *Openness to experience* was related positively to spirituality, but negatively to the behaving and the belonging religious dimensions. Finally, all religious measures (except spirituality) were positively associated with *life satisfaction*.[4]

Unique effects of the four religious dimensions

To further investigate unique relationships of the four religious dimensions, data were analyzed via generalized structural equation modeling (path analyses) using the Stata software, version 15. To account for the nested structure of the data, the random effect of country was included in each model. Given the number of dependent variables and as a means of streamlining the presentation of results and reducing inflation of the alpha level (due to a wide number of analyses run), three models were tested. They grouped, respectively, (1) the personality traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience) as predictors, (2) the two health indicators (life satisfaction and visits to doctor), and (3) the three socio-cognitive orientations (existential quest, need for closure, and authoritarianism) as outcomes. In each model, all four religious dimensions were entered as outcomes (Model 1) or predictors (Models 2 and 3) and the random effects of country, age, and gender were added as control variables.[5] Regression coefficients are provided in Figure 2.

As far as the *basic personality traits* are concerned, paralleling the correlational analyses, the first model (Figure 2, top) showed that agreeableness and conscientiousness were associated with all four dimensions of religiosity. Extraversion was uniquely related to

the belonging dimension while neuroticism was not predictive of any religious dimension. Finally, openness to experience negatively predicted the behaving and belonging dimensions.

Regarding *well-being* (Figure 2, middle panel), the frequency of medical visits was positively predicted by the believing dimension and negatively by the behaving one. Life satisfaction was predicted positively by the bonding and belonging dimensions and negatively by the believing one. Finally, the model including the *socio-cognitive orientations* (Figure 2, bottom) showed that the believing dimension was uniquely related to high existential quest, whereas the behaving and belonging dimension were predicting low existential quest and high authoritarianism. Moreover, the behaving dimension of religiosity was uniquely predictive of high need for closure. The bonding dimension was unrelated to any socio-cognitive construct.

Indirect effects of the religious dimensions on well-being through personality

In light of the above correlational and GSEM analyses results, we additionally explored the indirect effects of the religious dimensions on well-being through personality [6]. Prior to multilevel mediation analyses, linear mixed regression models including the random effect of country and controlling for gender and age were run to investigate the effects of personality traits and socio-cognitive orientations on health (see Supplementary Material, Tables 4 and 5). Four indirect effects of the dimensions of religiosity through personality or socio-cognitive constructs on life satisfaction (but not on the frequency of medical visits) were found, using a SPSS macro (MLmed) designed by Rockwood and Hayes (2017) to test for multilevel mediations (see Figure 3 for the regression coefficients).

First, the effect of the *bonding* dimension on high life satisfaction was partially mediated by *agreeableness*, $IE = .005$, $SE = .002$, $Z = 2.15$, $p = .032$, Monte Carlo (MC) 95% $CI = [.001, .009]$ (Figure 3, top panel). Second, there existed a significant indirect effect of the *belonging* dimension on increased life satisfaction through high *extraversion*, $IE = .012$, $SE = .004$, $Z = 2.84$, $p = .004$, Monte Carlo (MC) 95% $CI = [.004, .021]$ (Figure 3, second panel).

Moreover, an indirect effect of the *behaving* dimension on increased life satisfaction through *reduced existential quest* was found, $IE = .013$, $SE = .004$, $Z = 3.37$, $p < .001$, MC 95% $CI =$ [.006, .021] (Figure 3, third panel). Finally, the effect of the *believing* dimension on *decreased* life satisfaction was significantly mediated by *increased existential quest*, $IE = -.013$, $SE = .004$, $Z = -3.53$, $p < .001$, MC 95% $CI = [-.021, -.006]$ (Figure 3, bottom panel).

Discussion

With data from 15 countries, mostly in Europe, but also in the Americas and Asia, we provided evidence that religiousness can be conceived and measured as a multidimensional construct of individual differences, with four interrelated but distinct dimensions: *believing, bonding, behaving*, and *belonging*. These dimensions concern, respectively, the cognitive, emotional, moral, and social aspects, motives, and functions of religiousness.

We provided first evidence of the psychometric qualities of the measure, in terms of reliability, convergent and discriminant validity, and generalizability of the factorial structure across samples. Second, we found both similar and differential relationships of the four dimensions with other religious orientations, i.e. spirituality and fundamentalism, and psychological variables, i.e. personality traits, well-being, and the socio-cognitive orientations of existential quest, need for closure, and authoritarianism. Third, this work indicated both generalizability of the four dimensions across individuals and countries differing in religious affiliation and heritage (predominantly Catholic, mixed Protestant-Catholic, Christian Orthodox, Jewish, Muslim, and Buddhist/Taoist) and cross-cultural variation on the degree of their interrelation and their relative importance within various cultural zones.

As sharing common variance on global religiosity distinguishing between believers and nonbelievers in the general population, the four dimensions were highly interrelated with each other and with spirituality and fundamentalism. Moreover, they were similarly and uniquely (after controlling for common variance) associated with high agreeableness and

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conscientiousness; and were similarly (before controlling for common variance) associated

with life satisfaction and low flexibility (low existential quest, high need for closure and

authoritarianism). These similar associations underline the idea that the religious dispositional

preferences for prosociality, self-control, and order preservation involve all four levels--

cognitive, emotional, moral, and social--and subsequent pathways for well-being. However,

when controlling for common variance, each of the four dimensions uniquely compared to the

other three, or some of them additionally, predicted distinct religious orientations and

psychological characteristics (for a synthesis, see Figure 5).

The believing and bonding dimensions were the important components of *spirituality*

and were preponderant in the secularized Western European countries—of Catholic or mixed

Catholic-Protestant traditions. The behaving and the belonging dimensions, and to some

extent the believing one, were associated with *fundamentalism*. The behaving dimension was

preponderant in a Muslim context (Turkey), and the belonging one, which was, across

cultures, the least endorsed, was to some degree important in a Jewish context (Israel). This

overall grouping of the four dimensions into two poles reminds of the two complementary

aspects of religion, the devotional and coalitional ones.

The above findings confirm ideas earlier developed where the combination of some of

the four dimensions was supposed to underline specific religious forms (Saroglou, 2011,

Table 3). In that model, believing *and* bonding were hypothesized to underline *spirituality*

(supported here), believing *and* behaving should underline *orthodoxy*, and behaving *and*

belonging should underline group moralism—we can call it *orthopraxy*. The latter assumption

was also supported here pointing out fundamentalism, primarily in its moralistic coalitional

aspect: behaving *and* belonging predicted authoritarianism, low openness to experience, and

low existential quest--fundamentalism was additionally predicted by the believing dimension.

It was also postulated (Saroglou, 2011) that the interrelations between the four dimensions

should be stronger in monotheistic contexts compared to Eastern religious ones, because of the integrative character, within the former religions, of dogmas, ethics, rites, and community into a unified set. The present work also provided evidence supporting this hypothesis.

Distinct patterns were observed of the effects of the four dimensions on life satisfaction through specific individual differences. The *bonding* dimension uniquely predicted life satisfaction through agreeableness. Because this dimension encompasses connectedness with the transcendence and others through shared emotions experienced in rituals, it is not surprising that this dimension was associated with healthy prosocial orientations and thus favored well-being. There may also exist a more intrapersonal emphasis on a search, through rituals, for experiencing positive emotions and/or regulation of negative emotions. This dimension was slightly preponderant in an Eastern Asian religious context privileging meditation, as well as in the US, where individual religious experience is favored.

The *believing* dimension showed interesting plasticity and a paradox. This dimension seemed to underline fundamentalism, but it was also the only one that uniquely predicted high existential quest. This variability is in principle in line with our operationalization of this dimension as qualitatively neutral, i.e. as possibly denoting literal or symbolic forms of religion. However, to the point it implied, in our data, high existential quest, i.e. valorization of doubt, the believing dimension turned out to predict decreased life satisfaction. Though unexpected, this finding seems in line with research indicating the vulnerability hidden behind religion-as-quest (Burris, Jackson, Tarpley, & Smith, 1996).[7]

The *behaving* dimension was also measured in a neutral way, i.e. not positioning the items' content explicitly toward a morality of care and justice or toward collectivist and self-control-oriented values. The items broadly referred to "values", "ethics", and "moral dilemmas". However, this dimension uniquely predicted high need for closure; and, as noted above, together with the belonging dimension, high authoritarianism and low existential quest

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and openness to experience. These findings suggest a somewhat conservative, moralistic

interpretation of this dimension by participants; or simply confirm the idea that religious

morality is closer to normative deontology rather than prosocial consequentialism (Deak &

Saroglou, 2015; Piazza & Landy, 2013). Thus, in a process theoretically similar but in

direction opposite to the one of the believing dimension, the behaving dimension indirectly

led to increased life satisfaction through low existential quest. This seems in line with

research suggesting a conservatism-well-being association (Napier & Jost, 2008).

The last, *belonging*, dimension, seemed, as noted earlier, to be appreciated less than

the other three dimensions. This may reflect a broad contemporary tendency within religion

(Molteni & Biolcati, 2018) since it hold in almost all cultural zones of the present study;

and/or may be due to the young age of participants. Finally, the belonging dimension was

uniquely related to extraversion—a factor encompassing gregariousness and sociability,

which partly explained the belonging dimension's effect on high life satisfaction. This

positive role on well-being may be interpreted as pointing to the critical importance social

support and other variables like social identity have for the religion-well-being positive links

(Hayward & Krause, 2014).

Though, we think, innovative and potentially fruitful, this work has several limitations.

The questionnaire we developed is brief, making each of the four dimensions, despite good

reliability and promising distinctiveness, perhaps not the broadest possible to capture the full

extent of each construct. Nevertheless, we developed a short measure for ease of

administration in samples including both believers and non-believers. Moreover, all samples

were composed of students. [8] Thus, the results may not generalize to an older adult

population. Young adults' familiarity with religion, as well as their religious attitudes and

behavior, are often weaker compared to older adults (Dillon, 2007). Similarly, differentiation

between the four dimensions at the individual level may increase with age; and in parallel,

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indiscriminate a-religious or antireligious attitudes, higher among the young, may decrease.

Other limitations include the self-reported character of the measures, including the religious

ones, what may be a source of some biases. Because of cross-culturally different social

desirability and pressure, in religious countries, people tend to over-evaluate their religious

attitudes (Rossi & Scappini, 2014), whereas this is not the case in secular countries (Brenner,

2011). Finally, the relationships of the religious measures with personality traits and well-

being were weak, but this is consistent with previous research.

A subtler limitation is that the four dimensions did not behave fully differently. Note

though that the four dimensions were conceptualized as very broad and abstract to include

various possible ways through which the respective cognitive, emotional, moral, and social

motives are expressed within a religion. In other words, this is a different operationalization

compared to other approaches that distinguish between qualitatively positive versus negative

aspects of religion, in terms, for instance, of motivation (intrinsic versus extrinsic), thinking

style (symbolic versus literal), or identity (inclusivist versus exclusivist). It is thus likely that

the present operationalization will provide quantitatively weaker differential findings, also

because the four dimensions are interconnected in human functioning.

However, beyond—or before—variability between fundamentalists and questers, or

between the intrinsic and the extrinsic believers, it is also theoretically important, from a

psychological point view, to elucidate the personality and cultural similarities and differences

between the cognitive, emotional, moral, and social dimensions of being or becoming

religious—or irreligious. Understanding individual differences in religiousness on these four

levels can be integrated into more general distinctiveness in humans' motives (understanding,

trusting, controlling, self-enhancing, and belonging: Fiske, 2014), orientation in individual

differences (see, for instance, the cognitive-experiential theory: Epstein, 2014), and

dimensions of human development: cognitive, emotional, moral, and social.

Footnotes

[1] Since the early creation of the measure years ago, work using this measure has been published, either, in two cases, by coauthors of the present work having used their own national data from Costa Rica and Taiwan, or by other scholars with data from Netherlands, Italy, France, Mexico, Nicaragua, Iran, and India (for references, see Supplementary Material, Appendix 1). Also, the data presented here are part of a larger survey that included data on inter-religious prejudice, impossible to include here for space reasons.

[2] More conservative constrained models were additionally tested to establish scalar (i.e., factor loadings and intercepts equals across countries) and strict (i.e., factor loadings, intercepts, and variances equals across countries) measurement invariance but significantly deteriorated the model fit. Adequate configural and metric invariances suggest that correlation and regression analyses can be confidently conducted using this scale across countries but that we should be cautious when interpreting mean difference across countries as scalar and strict invariances are not achieved (Steenkamp & Baumgartner, 1998).

[3] We also computed exploratory factor analyses, asking for extraction of four factors, distinctly for the seven cultural/religious zones, and repeated the same analyses only on the religious participants. Overall, across cultural zones, the items of the bonding and the belonging dimensions consistently had their highest loadings on the respective factors (only item 5 occasionally had its first loading on the belonging dimension). The items of the believing and the behaving dimensions in most cases had their first loading on the respective factors, but they could also interchange (in particular, item 1), though still having their second loading on the appropriate dimension. The total variance explained was each time high, varying from 80% to 85% in most cases and from 72% to 79% in Greece, Taiwan, and Turkey. Thus, in a future single study with a limited number of participants, the exact structure of the measure may not be perfectly reproduced.

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[4] Religiousness being conceived as the thoughts, feelings, values, and identity of people in reference to perceived transcendence, one could also conceive of the Four Basic Religious Dimensions scale as composing a global measure of religiousness, with all the items contributing to the average score (see, for studies having used the total score, references in the Supplementary material, Appendix 1). In our data, correlational analyses between the aggregate score of religiousness (reliability of $\alpha = .96$) and the psychological variables under study showed associations similar to the ones with the three-item index of religiosity (as in Table 6): extraversion (.04), agreeableness (.14), conscientiousness (.10), existential quest (-.19), need for closure (.30), and right-wing authoritarianism (.42).

[5] Among the four dimensions, no VIF value exceeded 4.5 which is below the value of 5, a commonly recommended threshold in the context of SEM, above which multicollinearity may be problematic (Hair, Black, & Babin, 2009; Kline, 1998).

[6] We do not postulate that religiosity precedes, chronologically and causally, personality. Given the cross-sectional nature of the data, it is meaningful to test whether religiosity's effects on well-being can be statistically partly explained, for instance, by the (some) religious people's agreeableness rather than to assume that, in the study's societies, (all) agreeable people become religious and thus have better life satisfaction.

[7] In line with research showing that culture moderates the religion-well-being association (Diener, Tay, & Myers, 2011), mixed-model analyses revealed a cross-level interaction between the believing dimension and country-level religiosity in predicting existential quest, $b = -.0717$, SE = .017, $t(3011,787) = -4.148$, $p < .001$, so that the association was positive in less religious countries but negative in more religious countries.

[8] In this international study, participants were students for practical reasons, since the collection of the data across the 15 countries did not benefit from a specific grant.

Declaration of Conflicting Interests

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Table 1

The Four Basic Dimensions of Religiousness Scale

Dimensions	Items
Believing (Meaning)	*1. I feel attached to religion because it helps me to have a purpose in my life*
	2. It is important to believe in a Transcendence that provides meaning to human existence
	3. Religious beliefs have important implications for our understanding of human existence.
Bonding (Emotions/Ritual)	*4. I like religious ceremonies*
	5. Religious rituals, activities or practices make me feel positive emotion
	6. Religion has many artistic, expressions, and symbols that I enjoy
Behaving (Morality)	*7. I am attached to the religion for the values and ethics it endorses*
	8. Religion helps me to try to live in a moral way
	9. When I've got a moral dilemma, religion helps me making a decision
Belonging (Community)	*10. In religion, I enjoy belonging to a group/community*
	11. Belonging to a religious tradition and identifying with it is important for me
	12. Referring to a religious tradition is important for my cultural/ethnic identity

Table 2

Interrelations (Mean Correlations Across Countries Weighted by Sample Size) Between the

Religious Measures, and Partial Correlations Controlling for Religiosity (in Parentheses)

	Believing	Bonding	Behaving	Belonging
Religiosity	.75 [.73, .76]	.62 [.59, .64]	.78 [.77, .79]	.73 [.72, .75]
Spirituality	.61 [.59, .63]	.51 [.49, .54]	.59 [.51, .61]	.55 [.53, .58]
	(.16 [.13, .20])	**(.12 [.09, .16])**	(.06 [.03, .10])	(.05 [.02, .09])
Rel. Fundamentalism	.57 [.55, .60]	.45 [.42, .48]	.60 [.57, .62]	.53 [.51, .56]
	(.23 [.20, .27])	(.12 [.08, .15])	**(.25 [.22, .28])**	**(.18 [.15, .22])**
Believing		.68 [.66, .70]	.81 [.80, .82]	.72 [.70, .73]
		(.41 [.38, .44])	(.54 [.52, .57])	(.38 [.35, .41])
Bonding			.67 [.65, .69]	.69 [.67, .71]
			(.37 [.34, .40])	(.44 [.41, .47])
Behaving				.78 [.77, .80]
				(.49 [.47, .52])

Notes. N = 3,157-3,165 (3,109). Except for < .06 (p < .01), all correlation coefficients are

significant at the p < .001 level. In brackets: 95% confidence intervals. In bold: religious

dimensions more importantly associated with spirituality and fundamentalism.

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Table 3

Means of the Four Religious Dimensions, by Religious Cultural Zone, and Comparisons

	M (SD)				Comparisons		
	Believing[a]	Bonding[b]	Behaving[c]	Belonging[d]	*dfs*	*F*	η^2
Secular W. EU	2.94 (1.7)[c,d]	2.89 (1.6)[c,d]	2.53 (1.7)[a,b,d]	2.62 (1.7)[a,b,c]	3,198	69.18***	.055
Relig. Catholic	4.07 (1.9)[b,c,d]	3.97 (1.8)[a,d]	3.93 (1.9)[a,d]	3.79 (1.9)[a,b,c]	3,752	12.49***	.016
Greece	3.38 (1.6)[b,d]	3.13 (1.5)[a,d]	3.21 (1.8)[d]	2.85 (1.5)[a,b,c]	3,259	9.41***	.055
Israel	3.50 (1.8)[b]	3.90 (1.9)[a,c,d]	3.40 (1.9)[b]	3.60 (1.8)[b]	3,144	7.24***	.047
USA	4.08 (1.8)[d]	4.21 (1.8)[c,d]	4.07 (1.9)[b,d]	3.82 (1.9)[a,b,c]	3,408	15.00***	.035
Turkey	5.10 (1.8)[b,c,d]	4.51 (1.9)[a,c,d]	5.44 (1.9)[a,b,d]	3.68 (1.9)[a,b,c]	3,246	144.85***	.369
Taiwan	3.91 (1.3)[c,d]	4.02 (1.3)[c,d]	3.76 (1.3)[a,b,d]	3.24 (1.2)[a,b,c]	3,232	34.45***	.128

Note. Letters indicate significant differences, *p* < .05. W. EU = Western European.

*** *p* < .001.

Table 4

Coefficients of Correlations Between the Religious Measures and the Other Psychological

Variables (Mean Correlations Across Countries Weighted by Sample Size)

Individual Differences	Religiosity	Spirituality	Four Religious Dimensions			
			Believing	Bonding	Behaving	Belonging
Personality						
Extraversion	.04*	.05**	.01	.03	.01	**.04***
	[.01, .07]	[.01, .08]	[-.03, .04]	[-.01, .06]	[-.03, .04]	**[.01, .07]**
Agreeableness	.13***	.10***	.09***	.09***	.11***	.09***
	[.10, .16]	[.06, .13]	[.06, .12]	[.05, .12]	[.07, .14]	[.05, .12]
Conscientiousness	.12***	.06***	.08***	.07***	.09***	.09***
	[.09, .15]	[.03, .10]	[.05, .12]	[.03, .10]	[.06, .13]	[.06, .12]
Neuroticism	.02	.03	.01	-.02	.01	.00
	[-.02, .05]	[-.01, .06]	[-.02, .05]	[-.05, .02]	[-.03, .04]	[-.04, -.03]
Open. to Experience	-.02	**.12***	-.02	.02	**-.06***	**-.04***
	[-.05, .01]	**[.09, .16]**	[-.05, .02]	[-.02, .05]	**[-.09, -.02]**	**[-.08, -.01]**
Well-being						
Life Satisfaction	.04*	.03	.04*	.10 ***	.07 ***	.08***
	[.01, .07]	[-.01, .07]	[.01, .08]	[.06, .13]	[.03, .10]	[.05, .11]
Medical Visits	.03	.03	.02	.03	.00	.01
	[-.01, .07]	[-.01, .07]	[-.01, .06]	[-.01, .06]	[-.03, .04]	[-.02, .05]
Socio-cognition						
Existential Quest	-.10***	.06***	-.03	-.06***	-.08***	-.08***
	[-.13, -.06]	[.03, .10]	[-.06, .01]	[-.10, -.03]	[-.12, -.05]	[-.12, -.05]
Need for Closure	.16***	.12***	.18***	. 15***	.20***	.19***
	[.13, .20]	[.08, .15]	[.14, .21]	[.11, .18]	[.16, .23]	[.15, .22]
RW Authoritarianism	.34***	.18***	.31***	.27***	.35***	.33***
	[.31, .37]	[.14, .21]	[.28, .34]	[.23, .30]	[.32, .38]	[.30, .36]

Notes. Significant correlation coefficients indicating uniqueness of a religious dimension

comparing to the other ones are in bold. RW = right-wing.

*** *p* < .001. ** *p* < .01. * *p* < .05.

Figure 1. Mean level of the four religious dimensions by religious cultural zone
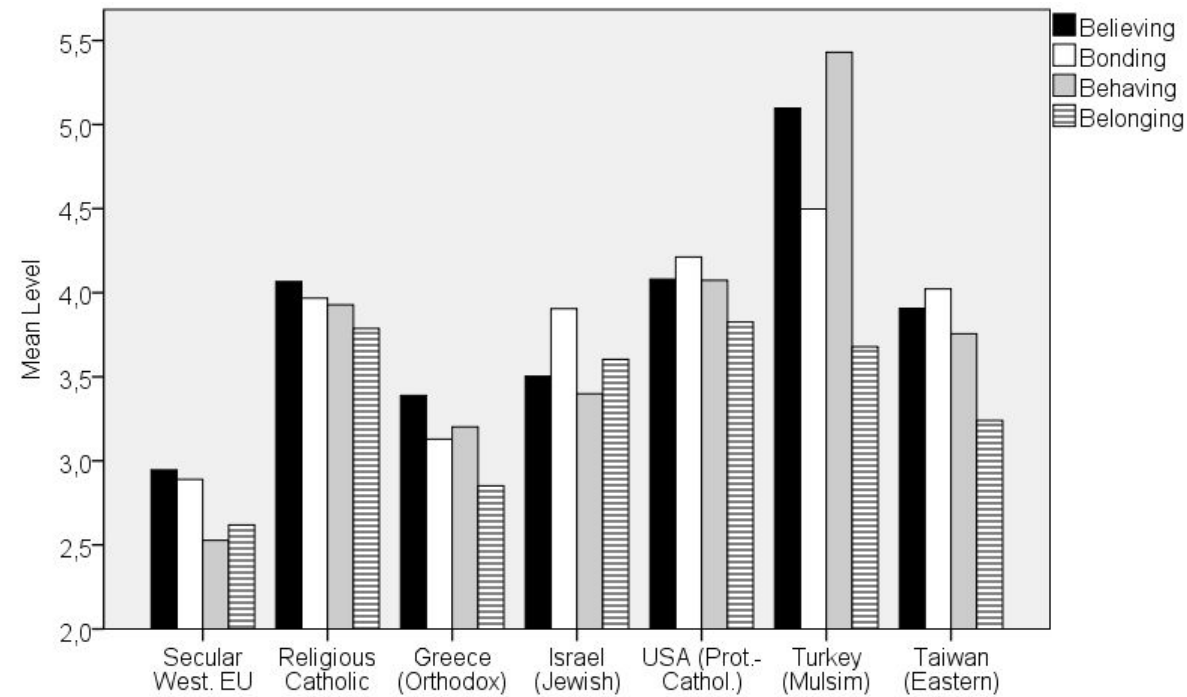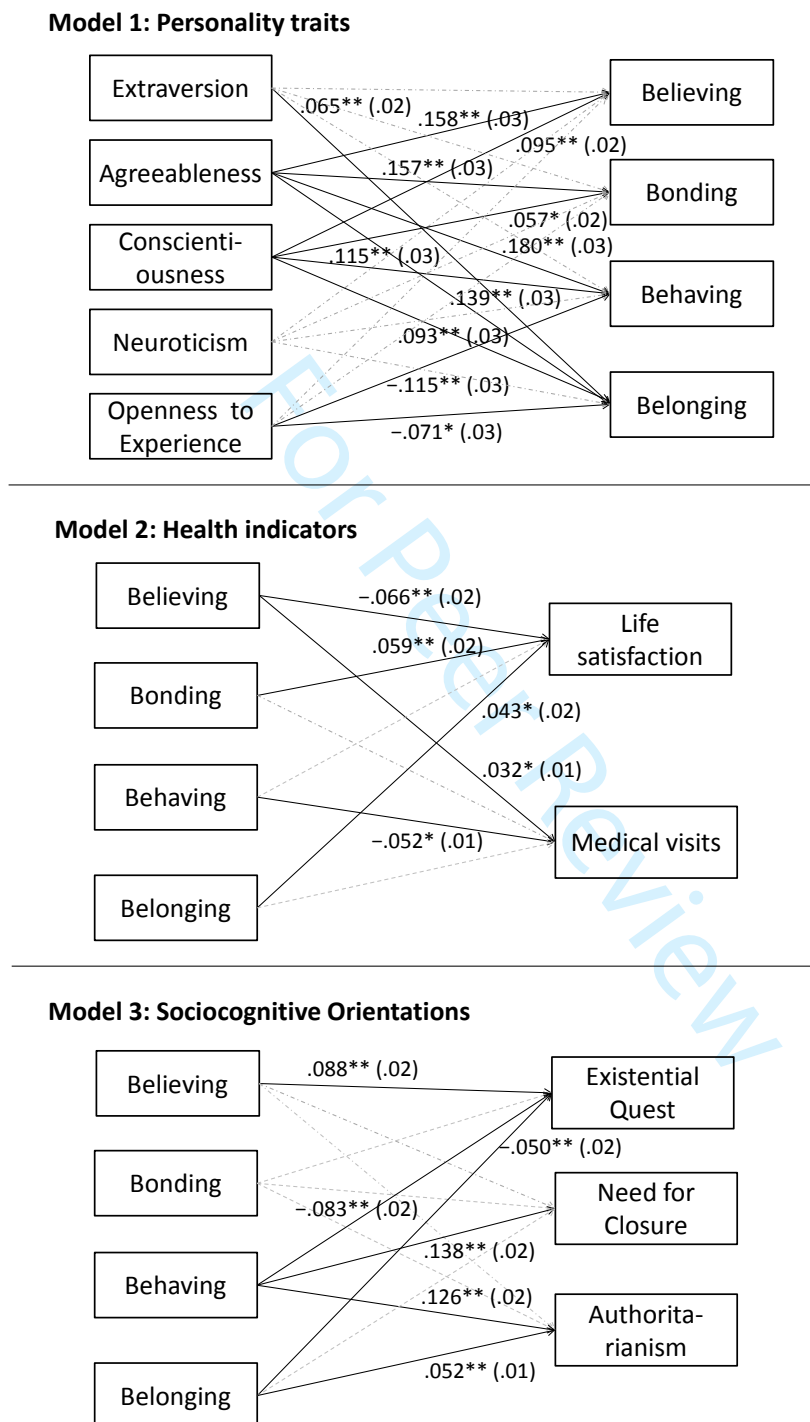

Note. Secular Western EU countries: Belgium, Germany, France, Spain, and Switzerland.

Religious Catholic countries: Costa Rica, Italy, and Poland. USA: Indiana and Arizona. The

scale ranges from 1 to 7, but the restricted range depicted here is from 2 to 5.5 to facilitate the

visibility of the Figure.

Figure 2. GSEM analyses of the unique effects of personality traits on the four religious dimensions (top), and of the four religious dimensions on well-being (middle) and socio-cognitive orientations (bottom)

Model 1: Personality traits

Extraversion
Agreeableness
Conscientiousness
Neuroticism
Openness to Experience

Believing
Bonding
Behaving
Belonging

.065** (.02)
.158** (.03)
.095** (.02)
.157** (.03)
.057* (.02)
.115** (.03)
.180** (.03)
.139** (.03)
.093** (.03)
−.115** (.03)
−.071* (.03)

Model 2: Health indicators

Believing
Bonding
Behaving
Belonging

Life satisfaction
Medical visits

−.066** (.02)
.059** (.02)
.043* (.02)
.032* (.01)
−.052* (.01)

Model 3: Sociocognitive Orientations

Believing
Bonding
Behaving
Belonging

Existential Quest
Need for Closure
Authoritarianism

.088** (.02)
−.050** (.02)
−.083** (.02)
.138** (.02)
.126** (.02)
.052** (.01)

Notes. Numbers on paths represent unstandardized regression coefficients. Standard errors are in parentheses. Discontinued lines stand for non-significant coefficients.

* $p < .05$. ** $p < .01$.

Figure 3. Indirect effects of religious dimensions through personality on life satisfaction

Mediation 1

Agreeableness

.04* (.02)   .12** (.02)

Bonding   .06** (.02)   Life Satisfaction

Mediation 2

Exraversion

.07** (.02)   .18** (.01)

Belonging   .03 ns (.02)   Life Satisfaction

Mediation 3

Existential Quest

−.07** (.02)   −.18** (.02)

Behaving   .01 ns (.02)   Life Satisfaction

Mediation 4

Existential Quest

.08** (.02)   −.18** (.02)

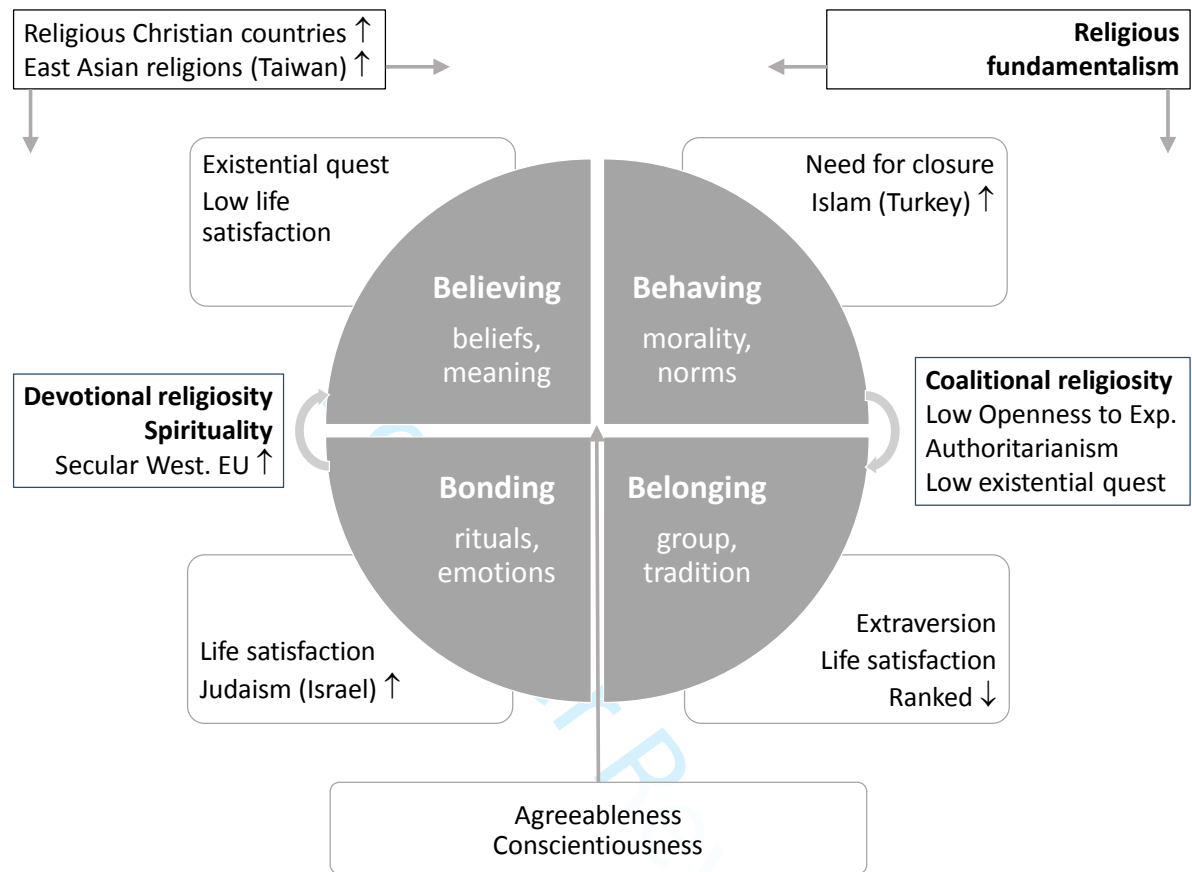Believing   −.05* (.02)   Life Satisfaction
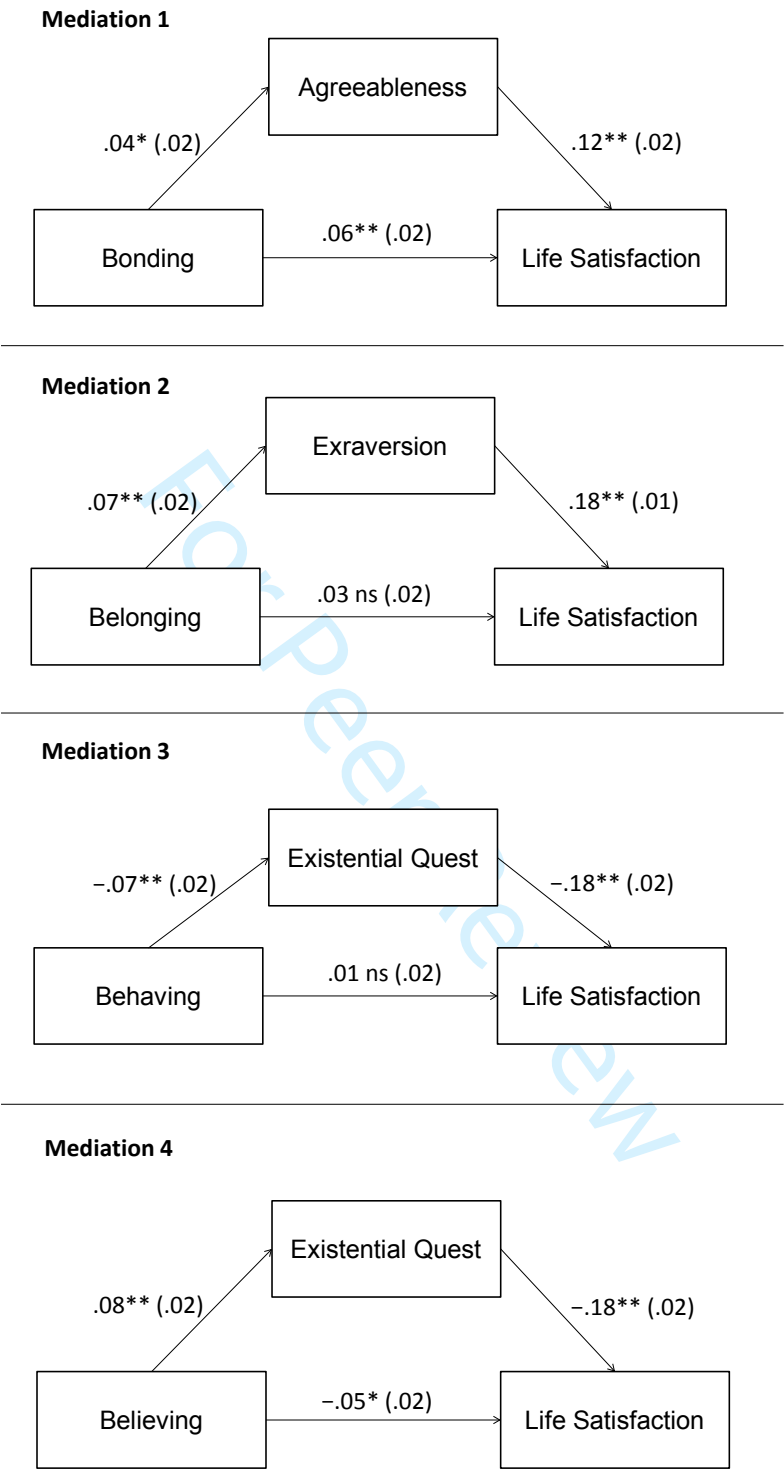
Notes. Numbers on paths represent unstandardized regression coefficients. SE is in
parentheses.
* *p* < .05. ** *p* < .01.

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Figure 4. Synthesis of the main findings on the characteristics of the four dimensions of

religiousness

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1

Supplementary Material

Supplementary Material Table 1

Demographics Distinctly by Country

	Age M (SD)	Gender (%female)	Catholics (N = 1070)	Protestants (N = 226)	Jewish (N = 132)	Muslim (N = 259)	Orthodox (N = 127)	Buddh./Taois. (N = 111)	Agnostics (N = 293)	Atheists (N = 594)	Other (N = 191)
Belgium (N = 198)	20.12 (2.7)	53.0	47	4	0	2	2	0	29	67	10
Costa Rica (N = 184)	20.53 (2.4)	32.1	65	19	0	0	0	7	29	12	30
France (N = 150)	19.54 (2.4)	81.3	25	3	1	2	0	0	14	94	11
Germany (N = 219)	21.80 (2.0)	76.7	108	21	1	2	1	0	15	64	6
Greece (N = 163)	21.50 (2.8)	51.5	1	1	1	1	115	0	8	22	8
Israel (N = 147)	27.57 (6.2)	100.0	0	0	121	1	3	0	1	15	6
Italy (N = 271)	22.83 (3.6)	59.8	138	1	2	3	1	0	43	66	17
Poland (N = 153)	22.01 (1.6)	87.6	142	1	0	0	0	0	2	4	3
Slovakia (N = 150)	21.46 (1.7)	61.3	149	1	0	0	0	0	0	0	0
Spain (N = 500)	21.40 (4.7)	78.2	277	1	0	2	0	0	66	121	21
Switzerland (N = 159)	25.10 (11.0)	78.6	29	49	0	3	1	0	12	37	21
US-Arizona (N = 210)	21.38 (4.3)	67.6	45	25	5	4	3	0	32	18	1
US-Indiana (N = 228)	23.42 (7.0)	65.8	44	100	1	6	1	0	11	11	21
Turkey (N = 250)	19.68 (1.8)	69.2	0	0	0	233	0	0	2	8	2
Taiwan (N = 236)	20.96 (5.6)	57.2	0	0	0	0	0	104	29	55	34

Supplementary Material Table 2

Interrelations Between the Religious Measures, Distinctly for Cultural Group of Countries

	Believing	Bonding	Behaving	Belonging
Religious Countries of Monotheistic Tradition [a]				
Religiosity	*.81* [.79, .83]	.67 [.64, .70]	*.82* [.80, .83]	*.70* [.67, .72]
Spirituality	.67 [.64, .70] **(.12** [.07, .17]**)**	.56 [.53, .59] **(.09**[.04, .14]**)**	.65 [.62, .68] (.04 ns[-.01, .09])	.56 [.53, .59] (.03 ns[-.02, .08])
Rel. Fundamentalism	.67 [.64, .70] **(.29** [.25, .33]**)**	.56 [.53, .59] **(.20** [.15, .24]**)**	.68 [.65, .70] **(.31** [.27, .35]**)**	.53 [.49, .56] **(.13** [.08, .18]**)**
Believing		*.73* [.71, .75] **(.44** [.40, .48]**)**	*.86* [.85, .87] (.57 [.54, .60])	*.73* [.71, .75] **(.34** [.30, .38]**)**
Bonding			*.72* [.70, .74] **(.41** [.37, .45]**)**	*.73* [.71, .75] **(.48** [.44, .52]**)**
Behaving				*.75* [.73, .77] **(.42** [.38, .46]**)**
Secular Countries of Monotheistic Tradition [b]				
Religiosity	*.78* [.76, .80]	.67 [.64, .70]	*.82* [.80, .84]	*.80* [.80, .82]
Spirituality	.64 [.60, .67] **(.20** [.14, .25]**)**	.55 [.51, .59] **(.14**[.08, .19]**)**	.62 [.59, .66] **(.09***[.03, .15]**)**	.59 [.55, .63] (.06*[.01, .12])
Rel. Fundamentalism	.51 [.47, .55] **(.16** [.10, .21]**)**	**.39** [.34, .44] (.04 ns [-.02, .10])	.52 [.48, .56] **(.16** [.10, .21]**)**	.51 [.47, .55] **(.13**[.07, .18]**)**
Believing		.69 [.66, .72] **(.36**[.31, .42]**)**	*.81* [.79, .83] **(.47** [.42, .51]**)**	*.75* [.72, .77] **(.33** [.28, .38]**)**
Bonding			.68 [.65, .71] **(.31** [.26, .36]**)**	*.74* [.71, .76] **(.47** [.42, .51]**)**
Behaving				*.84* [.82, .86] (.53 [.49, .57])
Eastern Asian Country [c]				
Religiosity	**.42** [.31, .52]	**.34** [.22, .45]	**.48** [.37, .57]	.55 [.45, .63]
Spirituality	**.42** [.31, .52] **(.20***[.07, .32]**)**	**.33** [.21, .44] **(.15*** [.02, .27]**)**	**.44** [.33, .54] **(.18*** [.05, .30]**)**	**.44** [.33, .54] **(.13***[.01, .25]**)**
Rel. Fundamentalism	**.23** [.10, .35] (.07 ns [-.06, .20])	.02 ns [-.11, .15] **(-.14***[-.26, -.01]**)**	**.24** [.12, .36] (.05 ns[-.08, .18])	**.35** [.23, .46] **(.16***[.03, .28]**)**
Believing		**.46** [.35, .55] **(.37** [.25, .48]**)**	.68 [.60, .74] (.59 [.50, .67])	.51 [.41, .60] **(.36** [.24, .47]**)**
Bonding			**.43** [.32, .53] **(.32** [.20, .43]**)**	**.31** [.19, .42] **(.16** [.03, .28]**)**
Behaving				.58 [.49, .66] **(.45** [.34, .55]**)**

Note. Significant coefficients < .50 are in bold; coefficients > .70 are in italics; and coefficients of partial correlations, controlling for religiosity, are in parentheses. In brackets: 95% confidence intervals.

[a] Costa Rica, Greece, Israel, Italy, Poland, Slovakia, Turkey, USA. N = 1,725-1,732 (1,717). [b] Belgium, Germany, France, Spain, Switzerland. N = 1,199-1,206 (1,196). [c] Taiwan. N = 235-236 (232)

* p < .05. ** p < .01. ns: nonsignificant. All other correlations: p < .001.

Supplementary Material Table 3

Differences in Mean Importance of the Four Religious Dimensions, by Religious Cultural Zone

Significant differences	M_{diffs}	*SDs*	*t*-tests
Secular West. European			
Believing, Bonding > Behaving	0.42, 0.36	1.07, 1.35	13.55***, 9.27***
Believing, Bonding > Belonging	0.33, 0.27	1.23, 1.21	9.37***, 7.73***
Behaving < Belonging	-0.09	0.99	-3.19**
Religious Catholic			
Believing > Bonding, Behaving	0.10, 0.14	1.33, 1.07	1.99*, 3.72***
Bonding, Behaving > Belonging	0.18, 0.14	1.29, 1.19	3.86***, 3.27***
Greece (Christian Orthodox)			
Believing > Bonding > Belonging	0.25, 0.28	1.38, 1.39	2.31*, 2.53*
Israel (Jewish)			
Bonding > Believing, Behaving, Belonging	0.40, 0.51, 0.30	1.59, 1.56, 1.36	3.07**, 3.92***, 2.69**
USA (Protestant, Catholic)			
Bonding > Behaving > Belonging	0.14, 0.25	1.27, 1.12	2.21*, 4.47***
Turkey (Muslim)			
Behaving > Believing > Bonding > Belonging	0.33, 0.60, 082	0.96, 1.31, 1.58	5.43***, 7.16***, 8.17***
Taiwan (East. Asian religions)			
Believing, Bonding > Behaving	0.15, 0.27	1.04, 1.37	2.22*, 2.97**
Believing, Bonding > Belonging	0.67, 0.78	1.24, 1.46	8.21***, 8.23***
Behaving > Belonging	0.52	1.15	6.87***

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

Supplementary Material Table 4

Linear Mixed Effects Model: Personality Traits on Health Variables

Fixed Effects	Life Satisfaction				Medical Visits			
	B	*SE*	*t*	*95% CI*	*B*	*SE*	*t*	*95% CI*
Level 1								
Extraversion	.162***	.015	10.46	[.13, .19]	.029**	.010	2.831	[.01, .05]
Agreeableness	.085***	.020	4.20	[.04, .12]	-.021	.013	-1.58	[-.05, .01]
Conscientiousness	.147***	.017	8.79	[.11, .18]	-.021	.011	-1.94	[-.04, .00]
Neuroticism	-.165***	.016	-10.34	[-.20, -.13]	.045***	.010	4.23	[.03, .06]
Openness to Exp.	.069***	.019	3.62	[.03, .11]	-.014	.013	-1.13	[-.04, .01]
Age	-.015**	.004	-3.46	[-.02, -.01]	-.003	.003	-0.98	[-.01, .01]
Gender	.062	.047	1.30	[-.03, .15]	.185***	.031	5.90	[.12, .25]
Random Effects			Wald Z				Wald Z	
Level 2								
Country	.120*	.048	2.50	[.05, .26]	.031*	.013	2.40	[.01, .07]

*** *p* < .001. ** *p* < .01.

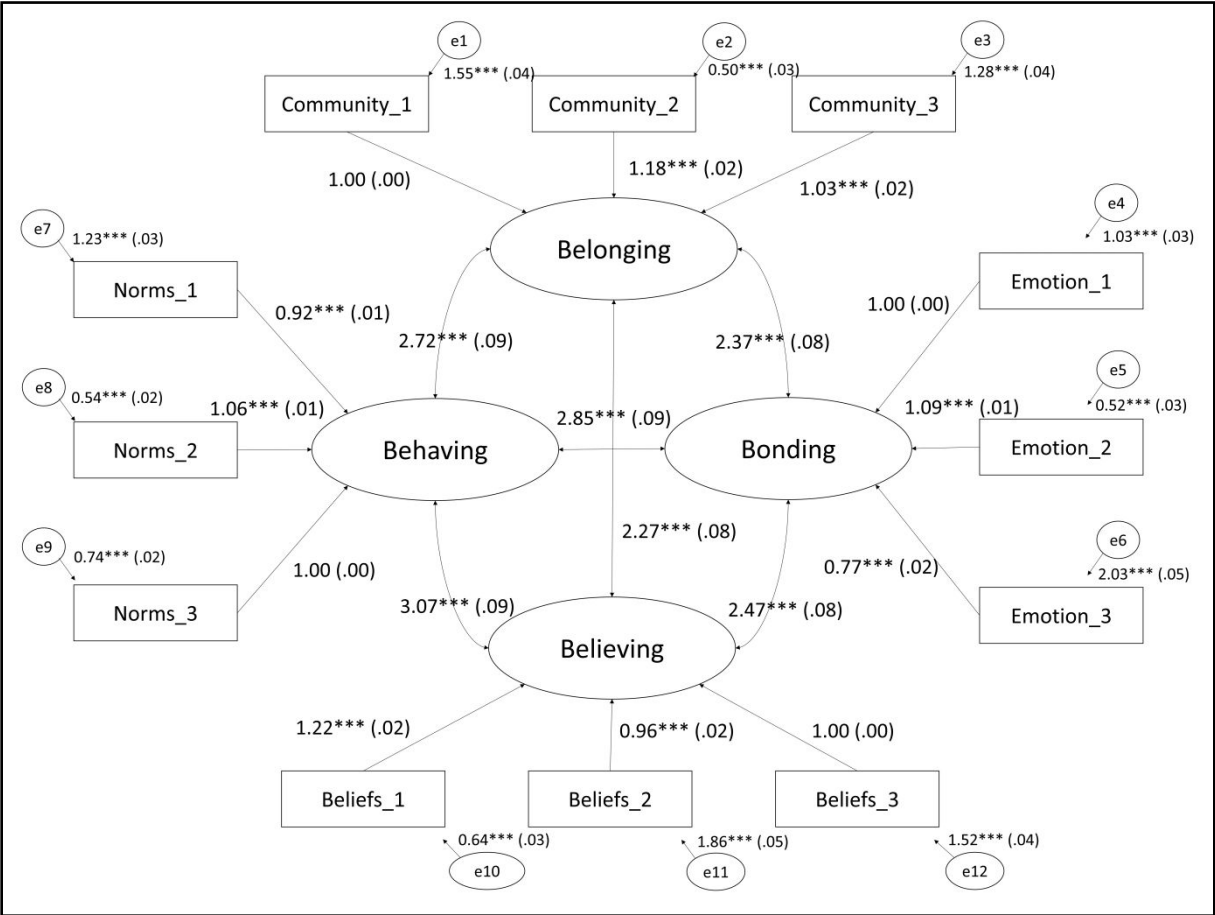RELIGIOUSNESS, PERSONALITY, AND CULTURE

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Supplementary Material Table 5

Linear Mixed Effects Model: Socio-Cognitive Constructs on Health Variables

Fixed Effects	Life Satisfaction				Medical Visits			
	B	*SE*	*t*	95% *CI*	*B*	*SE*	*t*	95% *CI*
Level 1								
Existential Quest	-.193***	.021	-8.97	[-.23, -.15]	.022	.013	1.61	[-.01, .05]
Need for Closure	.035	.022	1.55	[-.01, .08]	-.011	.014	-0.82	[-.04, .02]
RW Authoritarianism	-.031	.027	-1.14	[-.08, .02]	.026	.017	1.55	[-.01, .06]
Age	-.012*	.005	-2.54	[-.02, -.01]	-.003	.003	-1.02	[-.01, .01]
Gender	.104*	.049	2.15	[.01, .20]	.198***	.031	6.48	[.14, .26]
Random Effects			Wald Z				Wald Z	
Level 2								
Country	.178*	.070	2.53	[.08, .39]	.032*	.013	2.41	[.01, .07]

*** *p* < .001. * *p* < .05.

Supplementary Material Figure 1. Confirmatory factor analysis of the Four Basic Dimensions
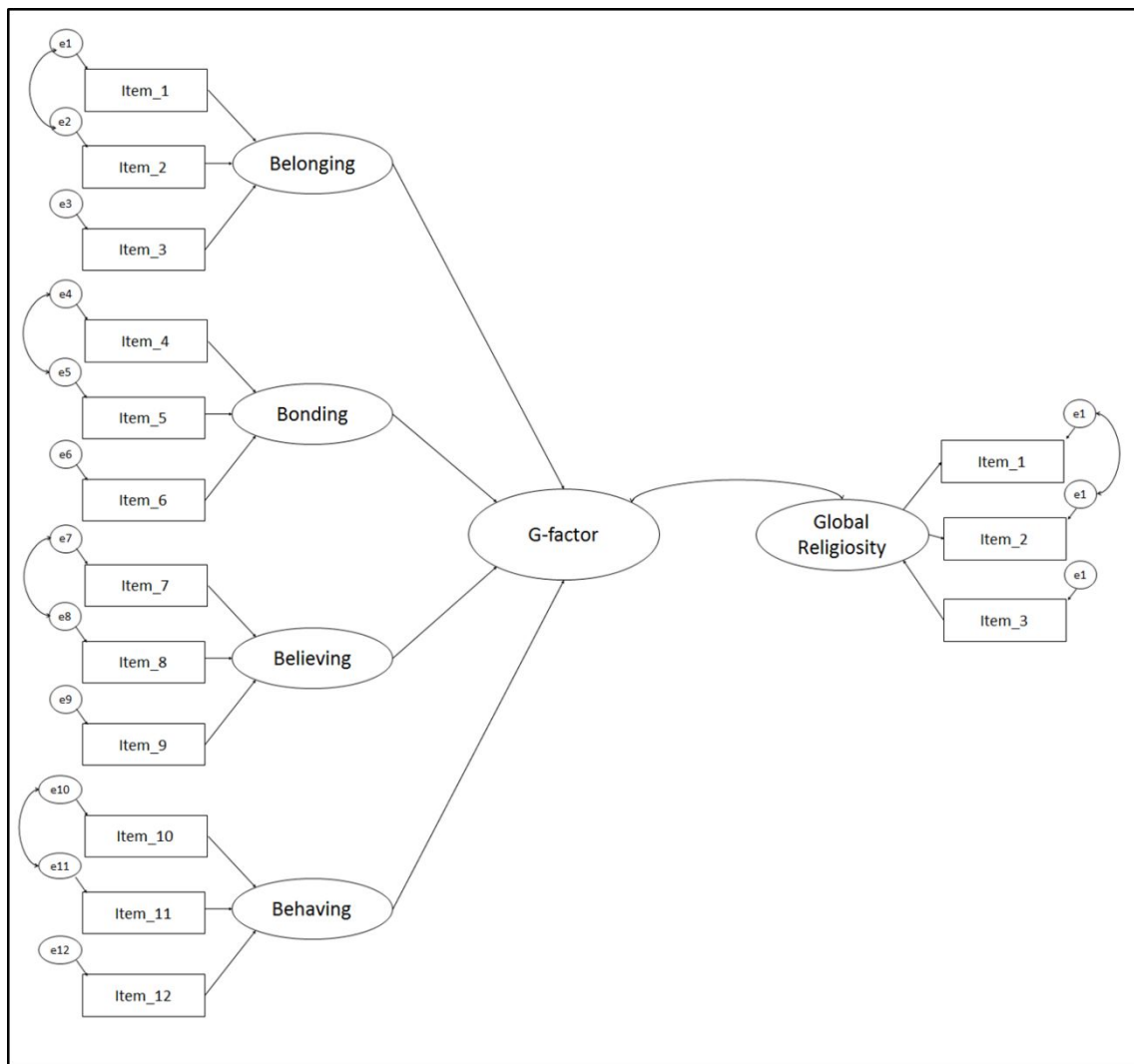
of Religiousness scale

Note. Numbers on paths represent unstandardized regression coefficients. Standard errors are
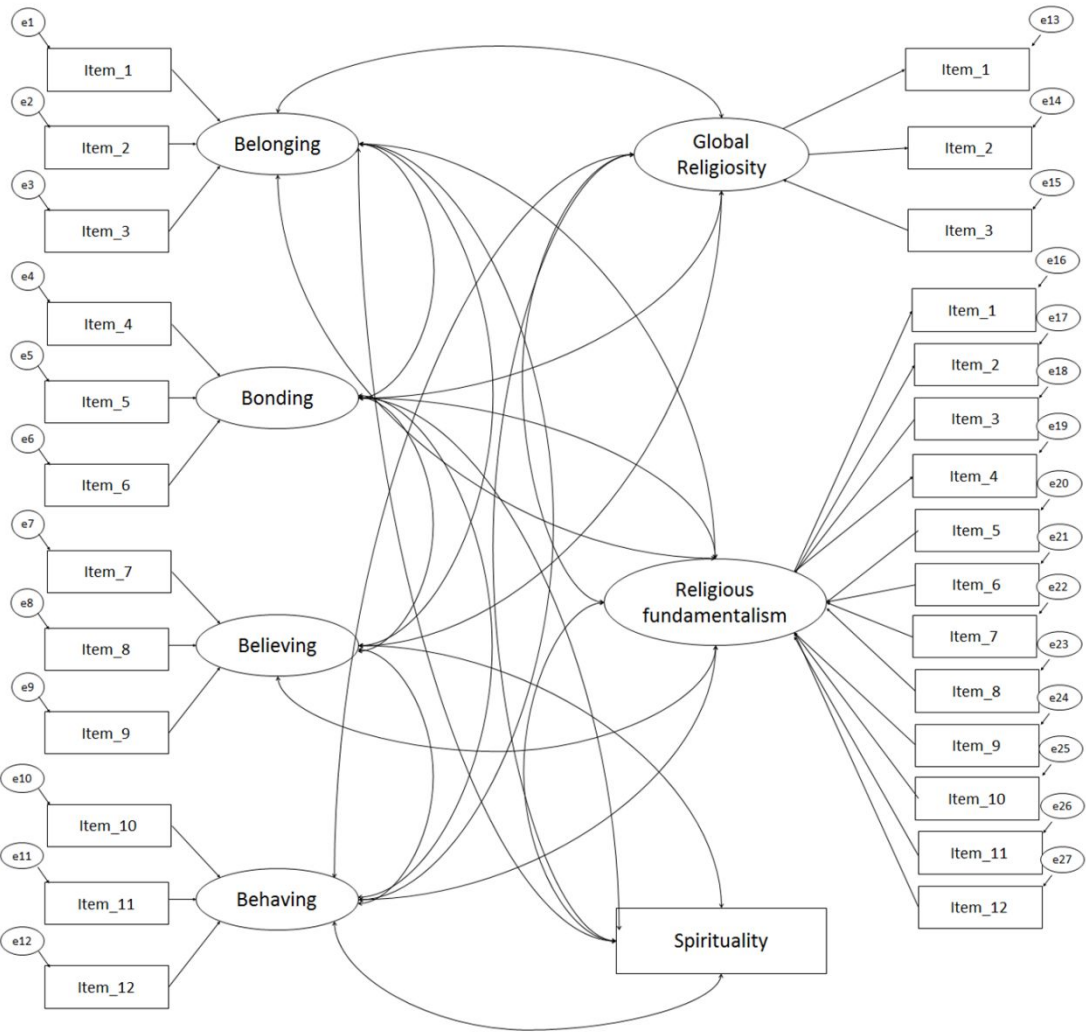
in parentheses.

*** *p* < .001.

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Supplementary Material Figure 2. Hierarchical model of global religiosity

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Supplementary Material Figure 3. Multi-group CFAs with fixed equal correlations between

latent variables

Appendix 1: Published Work with the Measure

Cohu, M., Maisonneuve, C., & Testé, B. (2018). Construction et validation de l'échelle de mesure des croyances relatives à la laïcité [Construction and validation of a measure of beliefs relative to "laïcité"]. *Psychologie Française*, *63*, 337-356.

Clobert, M., Saroglou, V., & Hwang, K.-K. (2017). East Asian religious tolerance vs. Western monotheist prejudice: The role of (in)tolerance of contradiction. *Group Processes and Intergroup Relations, 20,* 216-232.

Daghigh, A., DeShong, H. L., Daghigh, V., Niazi, M., & Titus, C. E. (2019). Exploring the relation between religiosity and narcissism in an Iranian sample. *Personality and Individual Differences, 139,* 96-101.

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