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“Spiritual but not religious”: Cognition, schizotypy, and conversion in alternative beliefs

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ABSTRACT

The spiritual but not religious (SBNR) are a growing population in secularizing societies. Yet, we know little about the underlying psychology of this group or their belief profile. Based on an individual difference approach, we address this knowledge gap by comparing SBNR with religious and non-religious participants. In a sample of Americans ($n = 1013$), we find that the SBNR differ from non-religious and religious participants in a number of ways. SBNR participants are more likely to hold paranormal beliefs and to have an experiential relationship to the supernatural (e.g. have mystical experiences and feelings of universal connectedness), but are similar to religious participants in their profile of cognitive biases. SBNR participants score higher on measures of schizotypy than the religious or non-religious. Reported conversions from one group (religious, SBNR, or non-religious) to another since childhood corresponds with predictable differences in cognitive biases, with dualism predicting conversion to religion and schizotypy predicting conversion to SBNR.

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1. Introduction

In many parts of the secularizing world, such as Northern Europe and the West coast of the United States and Canada, traditional organized religion is giving way to yoga studios, spiritual retreats, and healing crystals. “Spirituality without religion” is resonating with a growing populace as seen in best selling books by gurus and writers such as Deepak Chopra, Eckhart Tolle, and Paolo Coelho. Despite its growing popularity, little is known about the cognitive profile of this demographic group and the movement away from traditional religious beliefs into this new type of spirituality. What are the distinguishing features that set this growing group apart from traditional religion on one hand, and nonreligious populations on the other?

The spiritual but not religious are a growing proportion of the population in North America, Northern Europe, and elsewhere where secularization is spreading (Bender, 2010, 2012; Fuller, 2001; Roof, 1993). According to a Newsweek Poll, 30% of Americans identified as ‘spiritual but not religious’ in 2009, up from 24% in 2005 (Newsweek, 2009). A newspaper poll of Canadians found that among those who claimed to be atheist and agnostics,

27% still claimed to be ‘spiritual’ (Todd, 2014), highlighting the porousness of these self-described labels. Related to this is the growth of so-called “religious nones” or “unchurched” in North America (Twenge, Exline, Grubbs, Sastry, & Campbell, 2015). This group is typified by individuals who often report believing in God but do not affiliate with any religious tradition or attend religious services (Fuller, 2001). As of 2016, 79% of people in the USA reported believing in God (this number is 89% when ‘universal spirit’ is included with God), but only 54% claim to be a member of a church or other religious institution, and only 35% claim to attend a service every week or almost every week (Gallup poll, 2016). The SBNR phenomenon is also found in many parts of Europe, where opinion polls show consistently low (and declining) rates of religiosity, but considerable rates of alternative supernatural beliefs (Voas, 2008). This growing class of believers that do not consider themselves affiliated with an organized religious group has garnered much media attention and public discussion over the last few years (e.g. BBC, 2014; Davis, 2014; de Castella, 2013; Oppenheimer, 2014). It has also attracted some sociological attention (e.g. Bender, 2010, 2012; Fuller, 2001; Roof, 1993, 1999). However, we know relatively little about this social movement from within psychology and the cognitive science of religion.

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1.1. Why study the SBNR?

With estimates as high as 1 in 3 North Americans and Europeans, the SBNR are an important demographic group in their own right (see [Bender, 2012](#)). The SBNR represent a potentially different type of believer from the conventionally religious or non-religious populations that dominate research into supernatural beliefs. Thus, more research focused on this group is important for fully understanding the spectrum of causes and consequences of supernatural belief.

It has previously been suggested that ‘spiritual’ refers to the individual experience of the supernatural, while ‘religion’ represents an institutional affiliation that is less about unique individual experiences and more about shared doctrines (see [Pargament, 1999](#); [Roof, 1993](#)). The SBNR, with their presumed focus on the primacy of individual experience, offer an opportunity to look into forms of supernatural belief and experience that often fall under the label of spirituality, a construct that is overlooked in the focus on the organized religions.

In one study by [Marler and Hadaway \(2002\)](#), 71% of Americans reported that the concept of spirituality to be something clearly distinct from religiosity, and only 2.6% of participants thought these two terms should be considered entirely overlapping concepts. Other work conducted by [Saucier and Skrzypińska \(2006\)](#) found evidence that identities as ‘spiritual’ and ‘religious’ have distinctive personality traits among American adults. In their study, ‘Spiritual’ was predicted by such things as openness to experience, absorption, fantasy-proneness, dissociation, and magical or superstitious type beliefs, where religious belief was predicted by authoritarianism, traditionalism and collectivism (also see [Lindeman & Aarnio, 2006](#)).

The SBNR may represent supernatural believers under weaker cultural constraints on what they believe than the traditionally religious. A person can choose to believe in angels but not astrology, or tarot cards but not aliens, and still consider herself SBNR; whereas a Christian cannot choose to believe in God and the Holy Spirit, but not Jesus. Although religious believers following a particular tradition often hold a variety of beliefs that are inconsistent with theological doctrines ([McCauley, 2012](#); [Slone, 2004](#)), they still experience much stronger cultural norms about what they can or should believe, and they tend to maintain these beliefs through strong cultural learning mechanisms ([Gervais, Willard, Norenzayan, & Henrich, 2011](#); [Willard & Cingl, in press](#)). Greater understanding of the SBNR may give us insights into how different intuitions relate to different types of supernatural belief when the cultural pressures to believe in a certain set of dogma are lessened.

1.2. Core cognitive biases underlying supernatural belief

The observation that supernatural beliefs are widespread in human societies has led to a set of theories positing reliably developing cognitive biases supporting these beliefs. These theories assert that supernatural beliefs are deeply intuitive to humans ([Atran, 2002](#); [Barrett, 2004](#); [Boyer, 2008](#)). Intuitions towards the supernatural are rooted in biases in cognition that make people more likely to see certain things in the world as supernatural in origin ([Atran & Norenzayan, 2004](#); [Barrett, 2007](#); [Bloom, 2007](#); [Kelemen, 2004](#); [McCauley, 2011](#)). These biases are rooted in, or extensions of, Theory of Mind (ToM) (see [Lindeman, Svedholm-Häkkinen, & Lipsanen, 2015](#); [Willard & Norenzayan, 2013](#)). The ability to reason about minds is crucial for the propensity to reason about supernatural minds. There is evidence that people with lower levels of ToM are less likely to believe in God ([Banerjee & Bloom, 2014](#); [Caldwell-Harris, 2012](#); [Norenzayan, Gervais, & Trzesniewski, 2012](#)). Related to this, it has been argued that anthropomorphism, or the tendency to project human mental

traits to non-human agents and objects, is a central feature of religious belief, an idea that has a long intellectual history ([Barrett, 2004](#); [Barrett, 2007](#); [Feuerbach, 1957](#); [Guthrie, 1993](#); [Hume, 1779/1981](#)). Evidence for this is mixed. Though anthropomorphism does predict some supernatural beliefs, such as paranormal beliefs, it appears to be unrelated to belief in God ([Willard & Cingl, in press](#); [Willard & Norenzayan, 2013](#)). As well, the core intuition underlying mind body dualism, which facilitates thoughts of minds as being distinct from physical bodies, facilitates believing in ghosts, gods and souls ([Bloom, 2005](#); [Bloom, 2007](#); [Willard & Norenzayan, 2013](#)). We expect that these cognitive tendencies are also relevant to understanding the supernatural beliefs widespread among the SBNR.

1.3. Schizotypy and supernatural belief

Another propensity that has been linked to the spiritual experiences that we expect to be related to SBNRs is schizotypy (e.g. [Goulding, 2005](#); [Hergovich, Schott, & Arendasy, 2008](#); [Luhmann, 2005](#); [McCreery & Claridge, 2002](#); [Rust, 1992](#); [Schofield & Claridge, 2007](#); [Swami, Pietschnig, Stieger, & Voracek, 2010](#)). Schizotypy is a continuum of personality characteristics found in non-clinical populations that, at the pathological end, can be related to psychosis and schizophrenia ([Raine, 1991](#)). Schizotypy consists of a set of nine possible indications that range from social anxiety and eccentricity to magical ideation and hallucinations, all mild enough to not constitute a clinical diagnosis of schizophrenia. Schizotypy has been linked to non-conventional supernatural beliefs, a finding that is reliable enough that a subscale dedicated to it is in the Schizotypy Personality Quotient (magical thinking; [Raine, 1991](#)), as well as a separate but related magical ideation scale ([Eckblad & Chapman, 1983](#)).

What explains the connection between schizotypy and proneness to supernatural beliefs and experiences? Two theoretical links have been put forth in the literature: excesses in theory of mind ([Crespi & Badcock, 2008](#)) and the prevalence of hallucination in non-clinical populations ([Luhmann, 2005](#)). These theories are not mutually exclusive and may be related explanations. Schizotypy does seem to be related to excessive mental state projections to all sorts of agents and non-agents ([Gray, Jenkins, Heberlein, & Wegner, 2011](#)), but has also been related to deficits in theory of mind ([Biedermann, Frajo-Apor, & Hofer, 2012](#); [Frith, 1999](#); [Harrington, Langdon, Siegert, & McClure, 2005](#)). This relationship appears to be a complex one. Unlike people with autism, people with schizophrenia can easily reason about mental states and use mental states to interpret the behaviors and motivations of others. The recorded deficits come from the indiscriminate use of mental states, as well as inaccurate or inappropriate mental state reasoning in ToM tasks ([Fyfe, Williams, Mason, & Pickup, 2008](#)).

Figuring out the exact relationship between schizotypy, supernatural belief, and ToM is a complex and important goal, but it is beyond the scope of this paper. Instead, we are interested in finding out whether this measure has any explanatory power in differentiating the SBNR from the religious and non-religious. In addition, we wanted to see which of the several facets of schizotypal thought and experience are most likely to relate to supernatural beliefs.

We expect that only certain symptoms, particularly hallucinations, magical ideation, and sensing things are signs or references specifically for oneself (positive symptoms; see [Ferryhough, Jones, Whittle, Waterhouse, & Bentall, 2008](#); [Harrington et al., 2005](#)) will be related to spiritual beliefs and more typical of SBNR participants. We similarly propose that these symptoms will be positively related to over extensions of ToM measured by the cognitive biases related to supernatural belief (anthropomorphism

and dualism), despite being negatively related to standard ToM measures (mentalizing).

These symptoms are not clearly related to the sort of distress or activity impairment associated with a disorder (unlike social anxiety or constrained affect). Symptoms like hallucination may be much more common than has been previously recognized among non-clinical populations and when given context such as religious or spiritual experience, may be culturally meaningful and less likely to lead to distress (Laroi et al., 2014; Luhrmann, 2005; Luhrmann, 2011). The association between spirituality and only extrasensory or positive symptoms of schizotypy would support this perspective.

2. Current research

This paper explores several hypotheses about spirituality and the SBNR in a broad and diverse sample of Americans. First we assess a profile, in terms of cognitive biases and beliefs, for the SBNR in comparison to religious and non-religious participants. These latter two groups have received more attention in the literature. We expected that SBNR would score higher on measures of cognitive biases than the non-religious, and to be similar to the religious. This supports the idea that cognitive biases underlie supernatural belief generally, rather than only religious belief specifically. We include analytic thinking as an additional variable to assess whether the relationship between cognitive biases and supernatural belief holds above and beyond analytic tendencies, which previously have been found to be associated with religious belief (see Gervais & Norenzayan, 2012, Study 1; Pennycook, Cheyne, Seli, Koehler, & Fugelsang, 2012; Pennycook, Ross, Koehler, & Fugelsang, 2016).

Based on previous theoretical and empirical work, we expected that SBNR participants would score higher than the religious participants on paranormal beliefs and on more experiential measures of relating to the supernatural. This would suggest that even though the SBNR and the religious hold different types of supernatural beliefs, they share a similar tendency towards believing in the supernatural. We additionally examined these relationships controlling for cognitive biases to see if differences in cognitive biases affected the relationship between affiliation and type of belief and experience. We replicated these analyses using ratings of spirituality and religiosity to confirm these relationships correspond to spiritual belief, which is the key distinguishing feature of being SBNR rather than religious.

Next, we explored how SBNR and spirituality more specifically, relates to schizotypy and its symptoms. We expected that only some symptoms of schizotypy—those that include extra perceptual phenomena such as ideas of reference, hallucinations and magical ideation—will be positively predicted by spirituality, and as a result be more prevalent among the SBNR. We predicted no effect for negative symptoms such as social anxiety, constrained affect, or having no close friends.

A final set of analyses examined patterns of conversion. We looked at how cognitive biases and schizotypy are predicted by self-reported changes in affiliation since childhood. This allows us to conduct an exploratory analysis, comparing people who remain within the same group to people who convert out of that group into another. We expect that people lower in cognitive traits that encourage supernatural beliefs that were raised in religious or SBNR households to be more likely to opt out of religion (apostates) and spiritual beliefs. Conversely, those high in these cognitive traits should later adopt supernatural beliefs even if they report being raised non-religiously (converts). We test this by using different types of converts and apostates to predict ratings

on the cognitive bias measures. Additionally, we look at the relationship between converts/apostates and schizotypy.

3. Method

3.1. Participants

Our sample consisted of 1013 (58% female) Americans recruited through Amazon's Mechanical Turk (for more demographic information, see Table 1). We took several steps to ensure high data quality following recommended guidelines for online data collection. Four test questions were placed throughout the survey, as well as two questions near the end of the survey to detect inattention (Buhrmester, Kwang, & Gosling, 2011). Participants who failed to answer any of these questions correctly were removed before data analysis (63 participants whose responses did not pass quality check, were removed from an original sample size of 1076).

3.2. Materials

The survey was conducted using the online software from surveymonkey.com. All belief and demographic questions were asked at the end of the survey, after all other measures.

3.2.1. Measures

3.2.1.1. Mentalizing (EQ). We used Baron-Cohen's (2004) Empathy Quotient to measure mentalizing ($\alpha = 0.90$). We used this scale as an individual difference measure of self-reported theory of mind (e.g., I often find it difficult to judge if someone is rude or polite [reverse scored]; I am good at predicting how someone will feel.).

3.2.1.2. Dualism. Dualism is the tendency to see the mind as separate and distinct from the body. This cognitive tendency is theorized to be important for many supernatural beliefs, such as ghosts and gods, who are essentially disembodied minds (see Bloom, 2005). To measure this tendency we used Stanovich's (1989) dualism scale ($\alpha = 0.85$) (e.g., The mind is not part of the brain but it affects the brain; Mental processes are the result of activity in my nervous system [reverse scored]).

Table 1
Demographics.

Demographic dimension	
<i>Age</i>	
Minimum (years)	18
Maximum (years)	82
Mean (years)	32.3
<i>Gender</i>	
Male	42%
Female	58%
<i>Religious affiliation (group)</i>	
Christian	46.8%
SBNR	13.6%
Other religious	3.4%
Not religious	36.2%
<i>Religious affiliation (type)</i>	
Religious	24.9%
SBNR	34.3%
Nonreligious	40.8%

Of our participants who religious group affiliation (e.g. "Christian"), 29% claimed to be SBNR rather than religious, and 12% claimed to be nonreligious when asked to categorize their own beliefs. Of those who claimed no religious affiliation 91% subsequently said they were not religious, with the remainder claiming to be SBNR. Of the SBNR, 72% subsequently claimed to be SBNR, with the remainder claiming they were not religious. Data collected in 2013.

3.2.1.3. Anthropomorphism (IDAQ). Anthropomorphism is the tendency to over-extend human like characteristics to non-human entities. There is a long history of relating this tendency to religious belief (Feuerbach, 1957; Guthrie, 1993; Hume, 1981). Since we are particularly interested in the over application of human mental traits, we used Waytz, Cacioppo & Epley's (2010) Individual Differences in Anthropomorphism Quotient (IDAQ; $\alpha = 0.84$) (e.g., To what extent does the ocean have consciousness? To what extent do cows have intentions?).

3.2.1.4. Affiliation. We also asked participants to categorize themselves in one of three affiliations: religious, spiritual but not religious, or not religious (i.e. I consider myself to be: religious/spiritual but not religious/not religious). We also asked how participants were raised using this same categorization. Two additional questions were asked participants to rate separately how religious they were, and how spiritual they were on a 10 point scale.

3.2.1.5. Supernatural belief. We measured supernatural belief in two different ways. We measured belief in God using three questions (I believe in God, I believe in a divine being who is involved in my life, There is no god or higher power in the universe [reverse scored]; $\alpha = 0.93$). These questions have been used previously in Willard and Norenzayan (2013). We also looked at other types of supernatural belief using the paranormal belief scale (Tobacyk, 2004). Before administering the scale, we removed the religiosity subscale to make sure we were measuring something separate from religiosity, and also removed the mystical creatures subscale, because of its cultural specificity ($\alpha = 0.96$).

3.2.1.6. Mystical experience and connectedness. Two additional individual difference measures were included that are potentially relevant to SBNRs: universal connectedness (Dar-Nimrod, Buchtel, & Norenzayan, n.d.) ($\alpha = 0.93$; e.g. "I often feel like I am at one with the world"; "At times, I feel close to a spiritual power") and mystical experience (Hood, 1975) (e.g. "I have had an experience which I knew to be sacred"; "I have never had an experience in which time, place, and distance were meaningless"[reverse scored]). We used only half of the mystical experiences scale, using only the first two questions from each subscale ($\alpha = 0.88$). This was done to decrease the length and repetitiveness of the scale (see Catell, 1973).

3.2.1.7. Analytic thinking. Previous research has linked analytic thinking to religious disbelief (Gervais & Norenzayan, 2012, Study 1; Pennycook et al., 2012; Pennycook et al., 2016; Shenhav, Rand, & Greene, 2012). Similarly, religious participants tend to score lower on analytic thinking measures than the nonreligious. We wanted to see if this relationship held true for SBNR participants, and control for it in some of our analyses. This gives us some insight into whether this relationship is about supernatural belief in general or religious belief more specifically. We used the Cognitive Reflection Task which consists of three questions designed to measure analytic cognitive tendencies; the task requires analytically overriding incorrect but intuitively compelling answers (Frederick, 2005).

3.2.1.8. Schizotypy. We measured schizotypy using the Schizotypal Personality Disorder scale (SPQ; Raine, 1991). This scale provides an over all measure of schizotypy as well as measure all of the 9 sub-characteristics of this disorder within a non-clinical population. The nine subscales consist of: (1) ideas of reference (the sense that people notice you, you are special or that inanimate objects have messages for you); (2) unusual perceptions (seeing, hearing or otherwise sensing things that are not there); (3) magical thinking (experiencing the supernatural, belief in the paranormal); (4)

excessive social anxiety; (5) odd or eccentric behavior (other people commenting that ones mannerisms, habits, or behavior as strange); (6) no close friends; (7) odd speech (rambling, jumping from one topic to another, elusiveness); (8) constrained affect (being distant or aloof, poor none verbal communication); and (9) suspiciousness. This allows us to test the hypothesis that SBNR people will be high on the scales related to experience—such as hallucinations or seeing things as having a special message just for you—but not on those related to poor social abilities (Harrington et al., 2005).

4. Results

4.1. Predicting group affiliation from cognitive biases

We used a multinomial logistic regression to predict participants' reported affiliation as religious, SBNR, and non-religious, from ratings of religiosity and spirituality to establish the validity of these categorizations. Age (mean centered), gender (females = 1, males = 0), education (categorical), and income (categorical) were included as controls in this and all subsequent models. SBNR participants were set as the comparison group (intercept) and religious and not religious participants were compared to them. Ratings of religiosity predicted self-categorization as religious over SBNR (OR: 3.10, 95%CI: 2.50–3.63), and ratings of spirituality predicted self-categorization as SBNR over religious, suggesting that high rating of spirituality are more related to being SBNR than religious (OR: 0.56, 95%CI: 0.46–0.68). Ratings on both measures negatively predicted being non-religious (religious: OR: 0.67, 95%CI: 0.56–0.79; spiritual: OR: 0.40, 95%CI: 0.35–0.46).

Next, we used a multinomial logistic regression with SBNR as the comparison category to evaluate how cognitive biases predicted group affiliation. We found that higher scores on dualism predicted being religious over SBNR. Lower scores on dualism, anthropomorphism, and mentalizing independently predicted being nonreligious over SBNR (Table 2). Significance in this and all other tables is set to $\alpha = 0.01$ for significance, and marginal significance (marked with †) for significance at $\alpha = 0.05$. The association of analytic thinking with group affiliation was in the predicted direction but not significant, and therefore cannot account for the effects of cognitive biases in predicting group affiliation.

Education and income were measured categorically (i.e. income from \$50,000 to \$99,000) and included in all analyses as dummy codes. To look at the effects of these we ran this analysis again with

Table 2
Multinomial regression predicting affiliation type compared to SBNR.

	B(SE)	Odds [95% CI Odds]
<i>Religious</i>		
EQ	−0.01 (0.01)	0.99 [0.97, 1.01]
Dualism	0.51 (0.14) [†]	1.67 [1.26, 2.22]
Anthro	−0.03 (0.07)	0.97 [0.85, 1.11]
Analytic	−0.11 (0.08)	0.89 [0.77, 1.04]
Age	−0.02 (0.01) [†]	0.98 [0.96, 0.99]
Gender (F)	−0.27 (0.19)	0.76 [0.53, 1.10]
<i>Not Relig.</i>		
EQ	−0.03 (0.01) [†]	0.97 [0.95, 0.99]
Dualism	−0.86 (0.13) [†]	0.42 [0.33, 0.54]
Anthro	−0.19 (0.07) [†]	0.83 [0.73, 0.94]
Analytic	0.06 (0.07)	1.06 [0.92, 1.22]
Age	−0.04 (0.01) [†]	0.98 [0.95, 0.98]
Gender (F)	−0.41 (0.19) [†]	0.66 [0.48, 0.93]

Note:

† 95% confidence interval does not cross 0.

* 99% confidence interval does not cross 0. Additional control variables included: education and income.

education and income included as continuous variables and found that a higher income significantly predicts being SBNR over religious (OR: 1.29, 95%CI: 1.11–1.50). Income was not different for the non-religious and the SBNR (OR: 1.08, 95%CI: 0.94–1.25). There were no significant effects of education. Betas can be interpreted as movement from one category to another (religion OR: 0.97, 95%CI: 0.86–1.08; non-religion OR: 0.91, 95%CI: 0.81–1.01).

We used a set of regression analyses with dummy codes to compare affiliation groups to evaluate differences in belief. SBNR participants were set as the comparison group. All continuous measures, including the DVs, were standardized and centered at a mean of 0. Not surprisingly, non-religious participants were significantly lower on all beliefs than the SBNR (Table 3). Religious participants also were lower on all beliefs except belief in God. Cognitive biases were significant predictors of belief, controlling for group membership. Including these biases did not remove the association between group and belief, suggesting that group membership and cognitive biases are independent predictors of belief. The slight reduction in effect sizes for group affiliation may suggest some overlap in these relationships.

Similar results were found when ratings of individual's religiosity and spirituality replaced group affiliation as predictors (Table 3). Spirituality positively predicted all belief types. Religiosity was a significant negative predictor of all beliefs except belief in God

when ratings of spirituality are controlled for. In most cases, analytic thinking was a small predictor of all belief types except mystical beliefs, and only consistent across models for paranormal belief. The effects of cognitive biases remained the same as in the previous analysis, although with somewhat smaller effects across the board. This suggests that religiosity and spirituality ratings are capturing somewhat more of the variance than religious group affiliations.

4.2. Schizotypy

We conducted three sets of regression analyses. The first two examined the relationship between the schizotypy subscales and group affiliation, as well as the relationship between schizotypy subscales and ratings of religiosity and spirituality. The third examined the relationship between cognitive biases and the schizotypy subscales, controlling for religiosity and spirituality. This latter analysis allowed us to assess whether the relationship is primarily with spirituality or based on a relationship between schizotypy and cognitive biases.

Schizotypy, affiliation, and belief. Participants who categorized themselves as SBNR scored significantly higher on the SPQ scale than either religious ($\beta = -0.22$) or non-religious participants ($\beta = -0.24$) (Table 4). These effects were specific to only certain

Table 3

Group affiliation, or religiosity and spirituality ratings (model 1) and cognitive biases (model 2) predicting different types of beliefs. Religious and non-religious are compared to SBNR in the group affiliation regressions.

	Belief in God				Paranormal			
	Model 1		Model 2		Model 1		Model 2	
	β (SE)	95% CI	β (SE)	95% CI	β (SE)	95% CI	β (SE)	95% CI
Intercept	0.40 (0.18) [†]	[0.05, 0.75]	0.42 (0.17) [†]	[0.08, 0.77]	-0.06 (0.26)	[-0.58, 0.46]	-0.08 (0.25)	[-0.57, 0.40]
Religious	0.49 (0.05) [†]	[0.39, 0.60]	0.45 (0.05) [†]	[0.35, 0.55]	-0.40 (0.08) [†]	[-0.55, -0.25]	-0.45 (0.07) [†]	[-0.59, -0.30]
Non-Relig.	-1.25 (0.05) [†]	[-0.35, -0.16]	-1.14 (0.05) [†]	[-1.23, -1.04]	-0.83 (0.07) [†]	[-0.97, -0.70]	-0.66 (0.07) [†]	[-0.79, -0.53]
Mentalizing	---	---	0.04 (0.02) [†]	[0.01, 0.08]	---	---	0.005 (0.02)	[-0.05, 0.06]
Dualism	---	---	0.17 (0.02) [†]	[0.13, 0.21]	---	---	0.14 (0.03) [†]	[0.08, 0.19]
Anthro.	---	---	0.02 (0.02)	[-0.23, 0.05]	---	---	0.28 (0.03) [†]	[0.22, 0.33]
Analytic	---	---	-0.05 (0.02) [†]	[-0.09, -0.01]	---	---	-0.10 (0.03) [†]	[-0.15, -0.04]
R ²	0.62 [*]	[0.57, 0.65]	0.65 [*]	[0.60, 0.68]	0.20 [*]	[0.14, 0.23]	0.31 [*]	[0.25, 0.34]
Intercept	-0.20 (0.17)	[-0.54, 0.13]	-0.15 (0.17)	[-0.48, 0.18]	-0.50 (0.25)	[-1.00, 0.01]	-0.46 (0.24)	[-0.94, 0.02]
Spiritual	0.44 (0.02) [†]	[0.39, 0.49]	0.40 (0.03) [†]	[0.35, 0.44]	0.52 (0.04) [†]	[0.44, 0.59]	0.46 (0.04) [†]	[0.39, 0.53]
Religious	0.44 (0.02) [†]	[0.39, 0.49]	0.42 (0.02) [†]	[0.37, 0.46]	-0.11 (0.04) [†]	[-0.18, -0.03]	-0.15 (0.03) [†]	[-0.22, -0.08]
Mentalizing	---	---	0.02 (0.02)	[-0.02, 0.05]	---	---	-0.01 (0.03)	[-0.07, 0.04]
Dualism	---	---	0.13 (0.02) [†]	[0.09, 0.17]	---	---	0.09 (0.03) [†]	[0.03, 0.14]
Anthro.	---	---	-0.01 (0.02)	[-0.05, 0.02]	---	---	0.27 (0.03) [†]	[0.22, 0.15]
Analytic	---	---	-0.02 (0.02)	[-0.06, 0.02]	---	---	-0.07 (0.03) [†]	[-0.12, -0.02]
R ²	0.67 [*]	[0.62, 0.70]	0.69 [*]	[0.64, 0.71]	0.26 [*]	[0.21, 0.30]	0.35 [*]	[0.28, 0.38]
	Mystical experience				Connectedness			
Intercept	-0.25 (0.27)	[-0.78, 0.29]	-0.27 (0.27)	[-0.79, 0.26]	0.02 (0.25)	[-0.47, 0.51]	-0.02 (0.24)	[-0.50, 0.45]
Religious	-0.37 (0.08) [†]	[-0.53, -0.22]	-0.39 (0.08) [†]	[-0.55, 0.24]	-0.31 (0.07) [†]	[-0.45, -0.17]	-0.31 (0.07) [†]	[-0.45, -0.17]
Non-Relig.	-0.83 (0.07) [†]	[-0.97, -0.69]	-0.72 (0.07) [†]	[-0.86, -0.57]	-1.07 (0.06) [†]	[-1.20, -0.94]	-0.97 (0.07) [†]	[-1.09, -0.84]
Mentalizing	---	---	0.11 (0.03) [†]	[0.05, 0.16]	---	---	0.17 (0.03) [†]	[0.12, 0.23]
Dualism	---	---	0.09 (0.03) [†]	[0.03, 0.16]	---	---	0.04 (0.03)	[-0.01, 0.10]
Anthro.	---	---	0.11 (0.03) [†]	[0.05, 0.17]	---	---	0.13 (0.03) [†]	[0.08, 0.18]
Analytic	---	---	-0.05 (0.03)	[-0.05, 0.03]	---	---	-0.06 (0.03) [†]	[-0.12, -0.01]
R ²	0.14 [†]	[0.10, 0.17]	0.18 [†]	[0.13, 0.21]	0.29 [†]	[0.22, 0.31]	0.33 [†]	[0.27, 0.27]
Intercept	-0.66 (0.26) [†]	[-1.17, -0.14]	-0.65 (0.26) [†]	[-1.16, -0.14]	-0.57 (0.23) [†]	[-1.03, -0.11]	-0.59 (0.23) [†]	[-1.04, -0.14]
Spiritual	0.59 (0.04) [†]	[0.51, 0.66]	0.55 (0.04) [†]	[0.47, 0.62]	0.68 (0.03) [†]	[0.61, 0.74]	0.64 (0.03) [†]	[0.59, 0.72]
Religious	-0.17 (0.04) [†]	[-0.25, -0.10]	-0.19 (0.04) [†]	[-0.26, -0.11]	-0.10 (0.03) [†]	[-0.17, -0.04]	-0.11 (0.03) [†]	[-0.17, -0.04]
Mentalizing	---	---	0.08 (0.03) [†]	[0.02, 0.13]	---	---	0.14 (0.03) [†]	[0.09, 0.19]
Dualism	---	---	0.03 (0.03)	[-0.03, 0.10]	---	---	-0.03 (0.03)	[-0.08, 0.02]
Anthro.	---	---	0.11 (0.03) [†]	[0.05, 0.16]	---	---	0.12 (0.03) [†]	[0.07, 0.17]
Analytic	---	---	-0.02 (0.03)	[-0.08, 0.03]	---	---	-0.03 (0.03)	[-0.08, 0.02]
R ²	0.24 [†]	[0.18, 0.28]	0.26 [†]	[0.20, 0.30]	0.41 [†]	[0.33, 0.45]	0.44 [†]	[0.38, 0.47]

Note:

[†] 95% confidence interval does not cross 0.

^{*} 99% confidence interval does not cross 0. Additional control variables included: age, gender, education, and income.

subscales. Religious participants did not differ from SBNR participants on ideas of reference (the sense of being noticed, of being special, the feeling that inanimate objects have messages), social anxiety, constrained affect, suspiciousness, and having no friends. Non-religious participants did not differ from SBNR participants on social anxiety, suspiciousness, and odd speech. Importantly, SBNR participants scored higher on subscales that involved experiences: ideas of reference (only then the non-religious), magical ideation, and unusual perceptions. They also scored significantly higher on what is classified as odd behavior, suggesting that SBNR report more unconventional behaviors on average than the rest of the population. These effects were stronger when ratings of spirituality and religiosity were used instead of group affiliation (Table 4).

Schizotypy and cognitive biases. The effects of cognitive biases were examined, controlling for ratings of religiosity and spirituality. Overall, mentalizing was a significant negative predictor of schizotypy ($\beta = -0.32$) and anthropomorphism was a significant positive predictor ($\beta = 0.14$). These relationships hold when the magical ideation scale (which contains some questions about supernatural beliefs) is removed from the scale, (Spiritual: $\beta = 0.16$, 95% CI = 0.09 to 0.24; Religious: $\beta = -0.13$, 95% CI = -0.21 to -0.06 ; Mentalizing: $\beta = -0.34$, 95% CI = -0.40 to -0.28 ; Anthropomorphism: $\beta = 0.12$, 95% CI = 0.07 – 0.18). Dualism was a positive predictor of extra sensory perceptions (ideas of reference, magical ideation, and unusual perception) but was not a significant predictor of the scale over all.

4.3. Conversions and apostasy

We found substantial conversion and apostasy in our sample, though consistent with a secularizing trend, our participants were more likely to leave religion than to leave either SBNR or non-religion for religion (Table 5). We compared converts and apostates by interacting dummy codes for how participants were raised and how they currently affiliate in a series of regression analyses (Table 6). Participants who were raised non-religious and were still non-religious as adults were used as the comparison category. Mentalizing, dualism, anthropomorphism were the dependent variables to see which groups differed on these traits.

Participants who had been raised religiously but became non-religious were lower on dualism ($\beta = -0.24$) and anthropomorphism ($\beta = -0.25$) than those who had always been non-religious. Participants who were raised non-religious but became SBNR were significantly higher on schizotypy ($\beta = 0.41$). Participants who were raised non-religious but converted to religion were higher on mentalizing ($\beta = 0.56$) and dualism ($\beta = 0.27$) than those who had remained non-religious.

Compared with religious participants who were raised non-religious, currently religious participants who were raised religious scored lower on mentalizing (raised religious: $\beta = -0.48$). This could either mean that higher mentalizing is a consequence of conversion, or that higher levels of mentalizing spur conversion to religion more than maintenance of religion. Finally, currently SBNR participants who were raised either SBNR or religious scored

Table 4
Group affiliation, or religiosity and spirituality ratings, and cognitive biases and their relationship with different types of schizotypy and symptoms of schizotypy. Religious and non-religious are compared to SBNR in the group affiliation regressions.

	Ideas of Ref. β (SE)	Social Anx. β (SE)	Magic β (SE)	Unus. Percept. β (SE)	Odd Beh. β (SE)	Const. Affect β (SE)	Suspicious β (SE)	No Friends β (SE)	Odd Speech β (SE)	Whole Scale		
										β (SE)	95% CI	
<i>Model 1</i>												
Intercept	0.66 (0.28) [†]	0.33 (0.28)	0.25 (0.27)	0.66 (0.28) [†]	0.51 (0.28)	0.64 (0.28) [†]	0.81 (0.29) [*]	0.18 (0.29)	-0.18 (0.28)	0.63 (0.28) [†]	[0.07, 1.18]	
Religious	-0.07 (0.08)	-0.14 (0.08)	-0.36 (0.08) [*]	-0.31 (0.08) [*]	-0.37 (0.08) [*]	-0.08 (0.08)	0.02 (0.08)	0.04 (0.08)	-0.22 (0.08) [*]	-0.22 (0.08) [*]	[-0.38, -0.06]	
Not Relig.	-0.43 (0.07) [*]	-0.01 (0.07)	-0.72 (0.07) [*]	-0.50 (0.07) [*]	-0.18 (0.07) [†]	0.16 (0.07) [†]	-0.10 (0.07)	0.15 (0.07) [†]	-0.04 (0.07)	-0.24 (0.08) [*]	[-0.38, -0.10]	
R ²	0.11 [*]	0.08 [*]	0.14 [*]	0.10 [*]	0.09 [*]	0.07 [*]	0.05 [*]	0.04 [*]	0.06 [*]	0.09 [*]	[0.05, 0.11]	
<i>Model 2</i>												
Intercept	0.52 (0.28)	0.41 (0.29)	-0.06 (0.29)	0.48 (0.28)	0.43 (0.28)	0.80 (0.29) [*]	0.87 (0.29) [*]	0.38 (0.29)	-0.22 (0.29)	0.60 (0.29) [†]	[0.04, 1.16]	
Spiritual	0.22 (0.04) [*]	0.003 (0.04)	0.49 (0.04) [*]	0.35 (0.04) [*]	0.15 (0.04) [*]	-0.04 (0.04)	0.03 (0.04)	-0.05 (0.04)	0.10 (0.04)	0.18 (0.04) [*]	[0.10, 0.27]	
Religious	0.01 (0.04)	-0.06 (0.04)	-0.15 (0.04) [*]	-0.15 (0.04) [*]	-0.21 (0.04) [*]	-0.08 (0.04)	0.05 (0.04)	-0.05 (0.04)	-0.15 (0.04) [*]	-0.12 (0.04) [*]	[-0.20, -0.04]	
R ²	0.12 [*]	0.08 [*]	0.20 [*]	0.13 [*]	0.10 [*]	0.07 [*]	0.05 [*]	0.05 [*]	0.07 [*]	0.09 [*]	[0.05, 0.11]	
<i>Model 3</i>												
Intercept	0.54 (0.27) [*]	0.41 (0.27)	-0.03 (0.26)	0.51 (0.27)	0.43 (0.28)	0.80 (0.26) [*]	0.88 (0.28) [*]	0.39 (0.28)	-0.21 (0.28)	0.62 (0.27) [†]	[0.10, 1.15]	
Spiritual	0.18 (0.04) [*]	0.06 (0.04)	0.42 (0.04) [*]	0.31 (0.04) [*]	0.19 (0.04) [*]	0.04 (0.04)	0.03 (0.04)	0.02 (0.04)	0.14 (0.04) [†]	0.21 (0.04) [*]	[0.13, 0.29]	
Religious	-0.02 (0.04)	-0.07 (0.04)	-0.19 (0.03) [*]	-0.18 (0.04) [*]	-0.21 (0.04) [*]	-0.10 (0.04) [*]	0.03 (0.04)	-0.06 (0.04)	-0.17 (0.04) [*]	-0.15 (0.03) [*]	[-0.22, -0.07]	
Mental.	-0.05 (0.03)	-0.35 (0.03) [*]	0.04 (0.03)	-0.03 (0.03)	-0.18 (0.03) [*]	-0.45 (0.03) [*]	-0.16 (0.03) [*]	-0.43 (0.03) [*]	-0.27 (0.03)	-0.32 (0.03) [*]	[-0.39, -0.26]	
Dualism	0.07 (0.03) [*]	-0.02 (0.03)	0.09 (0.03) [*]	0.08 (0.03) [*]	-0.02 (0.03)	-0.02 (0.03)	0.02 (0.03)	-0.03 (0.03)	-0.01 (0.03)	0.02 (0.03)	[-0.04, 0.08]	
Anthro	0.16 (0.03) [*]	0.04 (0.03)	0.19 (0.03) [*]	0.17 (0.03) [*]	0.04 (0.03)	0.07 (0.03) [*]	0.14 (0.03) [*]	0.04 (0.03)	0.09 (0.03) [*]	0.14 (0.03) [*]	[-0.08, 0.20]	
Analytic	-0.08 (0.03) [*]	0.03 (0.03)	-0.08 (0.03) [*]	-0.07 (0.03) [*]	0.04 (0.03)	0.01 (0.03)	-0.08 (0.03) [*]	0.02 (0.03)	0.01 (0.03)	-0.03 (0.03)	[-0.09, 0.02]	
R ²	0.16 [*]	0.19 [*]	0.26 [*]	0.17 [*]	0.13 [*]	0.26 [*]	0.10 [*]	0.22 [*]	0.14 [*]	0.21 [*]	[0.15, 0.23]	

Note:
[†] 95% confidence interval does not cross 0.
^{*} 99% confidence interval does not cross 0. Additional control variables included: age, gender, education and income.

Table 5
Raised and current affiliation.

Raised	Now			
	Religious	SBNR	Non-Relig.	Total
Religious	207 (33.80%)	188 (30.70%)	218 (35.60%)	613 (60.70%)
SBNR	13 (9.60%)	90 (66.70%)	32 (23.70%)	135 (13.40%)
Not Relig.	31 (11.80%)	68 (26.00%)	163 (62.20%)	262 (25.90%)
Total	251 (24.90%)	346 (34.30%)	413 (40.90%)	1010 (100%)

Table 6

Participants' upbringing and current affiliation predicting mentalizing, dualism, anthropomorphism and Schizotypy. All categories are compared to those who were raised non-religious and currently identify as non-religious.

	Mentalizing		Dualism		Anthro.		Schizotypy	
	β (SE)	95% CI	β (SE)	95% CI	β (SE)	95% CI	β (SE)	95% CI
Intercept	-0.09 (0.29)	[-0.66, 0.48]	-0.69 (0.27) [†]	[-1.14, -0.06]	0.04 (0.29)	[-0.52, 0.61]	0.41 (0.29)	[-0.16, 0.97]
Raised SBNR	0.20 (0.19)	[-0.17, 0.57]	-0.25 (0.18)	[-0.60, 0.11]	-0.11 (0.19)	[-0.48, 0.26]	0.32 (0.19)	[-0.05, 0.69]
Raised Religious	-0.01 (0.10)	[-0.21, 0.20]	-0.24 (0.10) [†]	[-0.43, -0.04]	-0.25 (0.10) [†]	[-0.45, -0.05]	-0.05 (0.10)	[-0.25, 0.14]
Now SBNR	0.05 (0.14)	[-0.22, 0.33]	0.22 (0.13)	[-0.04, 0.48]	0.25 (0.14)	[-0.02, 0.53]	0.41 (0.14) [*]	[0.13, 0.68]
Now Religious	0.56 (0.19) [*]	[0.19, 0.94]	0.27 (0.18) [†]	[0.31, 1.03]	0.04 (0.19)	[-0.34, 0.42]	-0.09 (0.19)	[-0.46, 0.29]
Raised SBNR Now SBNR	0.09 (0.25)	[-0.39, 0.56]	0.51 (0.23) [†]	[0.05, 0.97]	0.14 (0.25)	[-0.35, 0.62]	-0.43 (0.08)	[-0.91, 0.05]
Raised Rel Now SBNR	0.20 (0.17)	[-0.13, 0.54]	0.48 (0.16) [*]	[0.16, 0.80]	0.02 (0.17)	[-0.32, 0.62]	-0.22 (0.17)	[-0.55, 0.12]
Raised SBNR Now Rel	-0.64 (0.37)	[-1.38, 0.09]	-0.03 (0.35)	[-0.73, 0.67]	0.16 (0.38)	[-0.57, 0.90]	-0.10 (0.37)	[-0.83, 0.93]
Raised Rel Now Rel	-0.48 (0.21) [*]	[-0.90, -0.06]	0.27 (0.20)	[-0.13, 0.67]	0.36 (0.21)	[-0.06, 0.78]	0.16 (0.21)	[-0.26, 0.58]
R ²	0.09 [*]	[0.06, 0.11]	0.17 [*]	[0.12, 0.20]	0.08 [*]	[0.05, 0.10]	0.08 [*]	[0.05, 0.11]

Note:

[†] 95% confidence interval does not cross 0.

^{*} 99% confidence interval does not cross 0. Additional control variables included: age, gender, education and income.

higher on dualism (raised SBNR: $\beta = 0.51$; raised religious: $\beta = 0.48$) than those who were SBNR but had been raised non-religious.

5. Discussion

In this study, we compared SBNRs to religious believers and nonbelievers in relation to cognitive biases, supernatural beliefs and experiences, schizotypy, and patterns of conversion and apostasy (see Table 7 for a summary of findings). SBNR participants differ less from religious participants than non-religious participants in terms of the cognitive biases and beliefs. This is not surprising, but does suggest that the 'not religious' part of SBNR is more to do with their relationship towards organized religions than it does with their intuitions about the supernatural. Dualism is the notable exception to this; religious participants scored significantly higher on this dimension than SBNR participants. This is consistent with previous findings that link dualism, but not anthropomorphism, to belief in God—a belief more strongly associated with religious believers (Willard & Norenzayan, 2013). Non-religious participants, on the other hand, appear to be less prone to any of these intuitions. Moreover, these differences are not accounted for by differences in analytic thinking, which in previous research has been shown to be related to lower religious belief (see Gervais & Norenzayan, 2012; Pennycook et al., 2012; Pennycook et al., 2016; Shenhav et al., 2012).

In terms of the content of their beliefs and experiences, SBNR participants had lower belief in God than religious participants, but a higher average belief in the paranormal (see Table 3). In addition, SBNR participants scored higher on both mystical experiences and connectedness than religious participants. A critical distinguishing feature of SBNRs and the conventionally religious is that the former have a more experiential relationship with the divine, including feelings of being at one with the universe. Ratings of spirituality followed the same pattern when religiosity was controlled for. This confirms previous predictions that the experiential dimensions might distinguish between people who consider

Table 7
Summary of findings.

Variable	Finding
Cognitive biases	The SBNR were higher on all cognitive biases than the non-religious and similar to religious participants on all cognitive biases except mind-body dualism. Religious participants were higher in dualism than the SBNR. This suggests that, in terms of a cognitive profile, the SBNR look quite similar to the religious
Supernatural beliefs and experiences	SBNR participants scored higher than the non-religious on all supernatural belief and experience measures and higher than the religious on all measures except belief in God. A continuous measure of spirituality was also more strongly related to all beliefs/experiences except belief in God. Compared to the religious, the SBNR, and spirituality more generally, is more experiential, including greater mystical experiences and feelings of universal connectedness
Schizotypy	SBNR scored higher than both the non-religious and the religious on the overall schizotypy measure, but this difference was largely accounted for by the positive subscales of unusual perceptions, ideas of reference, and magical ideation. This suggests that though the SBNR are more likely to report extra sensory experiences such as hallucinations and magical ideation, they seem to be buffered from negative aspects related to schizotypy, such as social anxiety and constrained affect
Conversion and apostasy	Participants who were raised non-religious but are now SBNR scored higher on schizotypy than those that had stayed non-religious. Currently SBNR participants who were raised either SBNR or religious scored higher on dualism than those who were SBNR but had been raised non-religious. Participants raised non-religious but were now religious scored higher on mentalizing and dualism. Participants raised religious but were now non-religious scored lower on dualism and anthropomorphism than those who were raised non-religious and remained non-religious

themselves traditionally religious and those who report being spiritual (see [Pargament, 1999](#); [Roof, 1993](#)).

There are two plausible explanations for why SBNR participants report more encounters with the mystical realm and more experience of the supernatural: either participants decide to become SBNR because of the attraction to supernatural experience, or they have more supernatural experiences because this is emphasized in SBNR circles. The relationship between these experiential variables and 'spirituality', regardless of identification with an affiliation is supportive of the first explanation; but more work is needed to reach firmer conclusions.

Our finding that non-religious participants were lower on schizotypy than the SBNR is in line with previous work on supernatural beliefs and schizotypy. The difference between religious and SBNR groups is more interesting. Both traditional believers and the SBNR espouse supernatural beliefs, and therefore it is not immediately obvious as to why the latter should be more likely to show schizotypal tendencies than the former. Importantly, these effects are, as predicted, driven by symptoms related to experiences, such as hallucination and magical thinking. It is possible that some conventional religion may suppress these experiences in favor of more structured traditional beliefs guided by dogma.

Religious beliefs displacing the belief in magic is one way this could take place. The need to explain parts of the world as intentional and full of mental states is no longer necessary if one accepts that a single, all-powerful intentional agent (God) is in control of the whole world. Another possibility is that this relationship is being driven by some other third variable, such as traditionalism or conservatism. Both schizotypy and alternative religious beliefs may be related to a personality profile that encourages deviation from dominant cultural norms, as captured by openness to experience ([Piedmont & Wilkins, 2005](#); [Saucier & Skrzypińska, 2006](#)).

Participants who rate themselves high on spirituality also had higher scores on schizotypy and participants who rated themselves high on religiosity had lower scores. The negative relationship between schizotypy and mentalizing, and the positive one with anthropomorphism encourages the hypothesis that this spectrum could be associated with inaccurate application of mental state reasoning but still involves a propensity to apply mental state reasoning broadly ([Harrington et al., 2005](#)).

Our final set of analyses support the general hypothesis that patterns of apostasy and conversion are related to levels of cognitive biases in predictable ways. People who were raised religious but low in anthropomorphism and dualism were more likely to report becoming apostates. Moreover, apostates scored lower on these traits than those who grew up in non-religious households, suggesting that supernatural beliefs are less intuitive to those that abandon them than to those that were raised to be non-believers. The opposite effect is seen for those who were raised non-religiously but became religious. These participants score higher in dualism and mentalizing than those who remained non-religious. The effects are somewhat less clear for those raised SBNR, in part because this group is small.

Currently SBNR participants who had been raised non-religiously scored higher on schizotypy than those who remained non-religious. Importantly, care should be taken to interpret these findings, as these data do not speak to causal claims. Current beliefs could be influencing cognitive biases, or current beliefs could be influencing how participants retrospectively categorize their upbringing. Regardless, these findings support the previous finding in this paper: mentalizing and over mentalizing are positively related to being a supernatural believer (either SBNR or religious), and schizotypy is related to an increase in the tendency to report being SBNR, but not being religious. If we assume that cognitive biases are stable over time, these results suggest that cognitive biases contribute to the adoption of later

beliefs in one's lifetime. Since these findings are correlational, however, they are consistent with a number of alternative explanations open to exploration by future research.

6. Conclusions

The spiritual but not religious are a growing demographic in secularizing societies. In this paper we have outlined several lines of evidence investigating the cognitive underpinnings of this phenomenon. We found that in a broad and diverse sample drawn from the American population, SBNR participants appear similar to religious participants on cognitive tendencies known to contribute to supernatural belief, and differ from the non-religious on these same tendencies. However, SBNRs differ from the conventionally religious in that they are more prone to paranormal beliefs, are more likely to have an experiential relationship to the supernatural, and see themselves more connected to the universe as a whole. Though SBNR participants see themselves to be 'non-religious', they endorse alternative supernatural beliefs that are also driven by some of the same cognitive biases that underpin more conventional religious beliefs.

The relationship between specific schizotypy subscales and spirituality has the potential to offer some new insight into how cognitive tendencies facilitate supernatural beliefs beyond our current understanding. Aspects of schizotypy may help us identify new potential pathways to supernatural belief that current theories have not yet addressed and current research has not yet uncovered. From this current research, it appears that an increased tendency to experience hallucinations and otherwise see the world in terms of magical thinking, may be central to spiritual experiences. Still, this evidence is in no way conclusive and is an area ripe for exploration. An interesting opportunity for future research is the relationship between supernatural experience and apophonia, or the tendency to find meaning in randomness, which has been previously been related to schizotypy ([Fyfe et al., 2008](#)).

There were some interesting demographic differences. Compared to both religious and non-religious participants, the SBNR tended to be older. The SBNR were also more likely to be female than non-religious participants and made a higher income on average than religious participants. This tendency of the SBNR to be older female has been noted elsewhere ([Roof, 1999](#)). The tendency of the SBNR to earn a higher income than the religious may suggest that one of the differences between these groups is material security. Previous research has suggested that religiosity is a way of coping with existential and material insecurity (see [Norris & Inglehart, 2004](#)). Perhaps spiritual belief without the stronger institutional and community aspects of religion is a type of supernatural belief that arises in more secure environments. This possibility is an interesting area for future research.

In conclusion, over the last several decades, a growing tide of people in North America and other secularizing parts of the world consider themselves to be "spiritual but not religious." These findings shed light on some of the cognitive underpinnings that sets this group apart from traditional religious believers on one hand, and nonbelievers on the other. Deeper understanding of SBNRs also point to the importance of exploring this alternative group beyond only "religious" participants in the quest to understand supernatural beliefs and experiences.

7. Author note

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Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.cognition.2017.05.018>.

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