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Handedness and religious beliefs: Testing the two possible accounts of authoritarianism and belief updating

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ABSTRACT

The purpose of the current investigation is to test two rival accounts for why consistent-handed individuals (that is, those who are strongly right- or left-handed) are more religious. Consistent-handed individuals are less likely to update their beliefs, thus they are likely to maintain religious beliefs that may be uncritically-held. However, consistent-handed individuals are likewise more authoritarian, which strongly predicts religiosity. We measured Americans' belief in God and in traditional religious teachings, their authoritarianism, magical ideation, and their susceptibility to the Barnum Effect. Consistent-handed participants were more religious on both measures. Both outcomes were mediated by authoritarianism, not magical ideation. Susceptibility to the Barnum Effect only mediated the effect for belief in God. We suggest that authoritarianism would better explain why consistent-handed individuals are more religious. We discuss some possible reasons why, the limitations of our study, and directions for future research.

1. Introduction

In two studies, Niebauer, Christman, Reid, and Garvey (2004) observed that individuals who are consistent-handed—that is, who are strongly either right- or left-handed—are more likely than mixed-handed individuals to believe in Biblical-based creation accounts of human origins. To propose an explanation for the results, they drew on belief updating (Niebauer, Aselage, & Schutte, 2002; Ramachandran, 1995). In the human brain, the right hemisphere is involved in monitoring beliefs and recording likely inconsistencies while the left hemisphere is involved in the maintenance of the consistency of beliefs. Because consistent-handed individuals evidence less interhemispheric interaction than their inconsistent counterparts, they are less likely to detect and register possible conflicts between Biblical human origins and the scientifically-held views. Niebauer et al. (2004) reported their overall proposed effect of consistency on religious beliefs, but they only suggested that belief updating is an explanation yet they did not test it empirically.

The link between interhemispheric interaction and belief updating is widely-accepted, evident in various contexts such as the popularity of different music genres (Christman, 2014) as well as reading (Christman, 2001). For example, consistent-handed persons are characterized by less cognitive flexibility (Sontam & Christman, 2012), exhibit less attitude change in response to persuasive messages (Christman, Henning, Geers, Propper, & Niebauer, 2008), are more rigid in perceptions of ambiguous figures (Christman, Sontam, & Jasper, 2009), and are poorer at counterfactual thinking (Jasper, Barry, & Christman, 2008) compared to inconsistent-handed persons. In turn, less belief updating is one of the bases for a receptivity toward religion as religious views are held despite scientific evidence that may contradict those views (van Elk & Wagenmakers, 2017). It is sensible that consistent-handed individuals might be more religious because they update their beliefs less, consistent with Niebauer et al. (2004)'s suggestion.

However, there is also a relationship between the lack of belief updating or related constructs and authoritarianism, a personality trait characterized by strong adherence to norms and obedience to authorities that promote them (Adorno, Frenkel-Brunswik, Levinson, & Stanford, 1950), and authoritarianism also predicts religiosity (Altemeyer & Hunsberger, 1992; Leak & Randall, 1995; Whitley Jr., 1999). For example, individuals who are high on authoritarianism are typically less open to experience (Butler, 2000; Ekehammar, Akrami, Gylje, & Zakrisson, 2004; McCrae & Costa, 1997; Oesterreich, 2005) and are less likely to change attitudes even when the source of the message is credible (Amir & Garti, 1977; Johnson, Torcivia, & Poprick, 1968). Inconsistent-handed persons are more authoritarian also due to the less interhemispheric interaction (Christman, 2014; Lyle & Grillo, 2014). Thus due to the close relationship between belief updating and authoritarianism the latter could easily explain Niebauer et al. (2004)'s results. That is, it might be authoritarianism—and not a lack of updating one's beliefs—that explains consistent-handed individuals' religious beliefs.

We have reason to predict though that authoritarianism may have

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greater explanatory power. There are at least two possible reasons why it may be. Firstly, belief updating depends on the assumption that consistent-handed individuals are religious in the first place and they fail to integrate due to their less interhemispheric interaction scientific arguments for the origins of human beings (Niebauer et al., 2004). But if "lack of belief updating" is the core premise, then it can also be an argument for why individuals who are consistent-handed who are irreligious in the first place might fail to integrate religious-based alternatives that may also provide convincing (if not necessarily scientifically-based) explanations for human origins—at least arguments that are strong or persuasive. Religious beliefs are at least partly cultural (D'Onofrio, Eaves, Murrelle, Maes, & Spilka, 1999; Waller, Kojetin, Bouchard Jr., Lykken, & Tellegen, 1990) so religion may not always be the natural state of affairs that requires updating. Secondly, belief updating can give rise to self-confidence and asymmetric updating in which individuals update their beliefs that support and not discount the initial ones (Sunstein, Bobadilla-Suarez, Lazzaro, & Sharot, 2016). Montgomery (1996) argued that economic approaches of beliefs formation might not provide an explanation that is sufficient for the origins of religious beliefs. In contrast, the link between authoritarianism and religiosity is better substantiated (Altemeyer, 1988; Altemeyer & Hunsberger, 1992; Kahoe, 1977; Mavor, Louis, & Laythe, 2011).

In the current research, we proceed with the presumption that consistent-handed individuals evidence less interhemispheric interaction but we test the two possible accounts for why this would increase religious beliefs, with the prediction that authoritarianism likely is a stronger explanation than belief updating. To do so, we assessed participants' belief in God and their belief in religious teachings in everyday life (non-specific to any particular religion)—thus two different measures of religious beliefs. We also assessed Right-Wing Authoritarianism to measure authoritarianism. To measure belief updating, as there is no single scale common in the literature, we used two proxies, namely magical ideation and one's susceptibility to the Barnum Effect. We will review the use of these measures as proxies for belief updating when describing our methodology.

Procedurally, we sought to establish firstly whether consistent-handed folks are more religious to confirm prior work (Niebauer et al., 2004) and secondly whether authoritarianism or belief updating (or both) would explain consistent-handed participants' religious beliefs. We will then discuss the findings as well as limitations and contributions of our work in our discussion.

2. Method

We recruited 743 Americans from Reddit (M_{age} = 38.32 years old, *S.D.* = 12.26), an online discussion community that Shatz (2017) suggested as useful for behavioral research. The study took participants on average 10 min of their time. There were 360 men (M_{age} = 36.56 years old; *S.D.* = 12.19) and 377 women (M_{age} = 40.16 years old; *S.D.* = 12.10). The difference in age was significant, $t(735) = 4.09$, $p < 0.001$. So, we conducted our primary analyses controlling for both gender and age later on. The sample included 339 who identified as nonreligious, 286 religious, 116 other, and 2 individuals did not indicate their religious identification. There were also 335 who supported the Democrats, 171 who supported the Republicans, 38 who supported the Libertarians, 10 who supported the Greens, 26 others, and 163 who identified themselves as independent. In terms of education, 8 did not finish high school, 335 finished high school, 311 completed university, 49 held a masters-level degree, 14 held a doctoral-level degree, while 22 held a professional degree. Also, 52 participants were unemployed, 98 were part-time employed, 432 employed full-time, 95 self-employed, 34 retired, and 10 students. Nineteen did not list their employment status.

2.1. Measured variables

2.1.1. Handedness

To measure participants' handedness, we employed the Edinburg Handedness Inventory (EHI; Oldfield, 1971). This is an inventory that presents 10 common motor tasks such as writing, drawing, and using a toothbrush, to which participants indicated whether they mainly use their right or left hand on a scale that ranges from −10 = "Always Left" to +10 = "Always Right." The EHI is commonly used to ascertain whether individuals are not simply right- or left-handed, and whether they are consistent- or inconsistent-handed (Christman et al., 2008; Prichard & Christman, 2016).

2.1.2. Religiosity

We measured religiosity in two ways given that there are numerous approaches to do so such as a belief in God, religious teachings, church attendance frequency and so forth. We measured religion using the first two ways. Firstly, we used the Beliefs Test (Thouless, 1935) by asking participants to respond on a 1 = "Certainly False" to 9 = "Certainly True" basis to these three statements: "There is a personal God"; "There is an impersonal God"; and "There is no god (either personal or impersonal)." According to psychologists who research religion, belief in God is central to religiosity (Batson & Stocks, 2004; Exline, 2002; Sedikides & Gebauer, 2009). Nonetheless, we measured religiosity in a different way, namely in the form of the Religious Doubts Scale (RDS; Altemeyer, 1988), which includes 10 items such as "Religion makes people do stupid things and give up perfectly wholesome pleasures for no good reason" to assess one's doubts in religious teachings. Each item was measured on 9-point scales from 1 = "Strongly Disagree" to 9 = "Strongly Agree" to measure the degree to which people experience doubts about traditional religious teachings. We purposely selected two different measures of religiosity that were not belief system-specific. For example, Niebauer et al. (2004) assessed the belief in Biblical, creationist accounts of human origins but such items would not be appropriate for individuals from other faith systems, such as Buddhism, that have no explicit teachings about evolution or human origins.

2.1.3. Right-Wing Authoritarianism

We measured participants' degree of Right-Wing Authoritarianism (RWA; Altemeyer, 1988), which includes 20 statements such as "It is always better to trust the judgment of the proper authorities in government and religion than to listen to the noisy rabble-rousers in our society who are trying to create doubt in people's minds," also on 9-point scales from 1 = 'Strongly Disagree' to 9 = 'Strongly Agree' to measure people's degree of submission to authority and obeying social convictions and norms. To be sure, there are many other ways to assess authoritarianism but we chose RWA as it is standard in numerous contexts such as in political psychology (Whitley Jr., 1999); it has been used in the psychology of religion as well (Hunsberger, 1995, 1996).

2.1.4. Magical Ideation

There is no scale to directly tap into belief updating. Therefore, we utilized two proxy measures. Firstly, we measured the Magical Ideation Scale (MIS; Eckblad & Chapman, 1983), which is a 30-item instrument consisting of true-false items designed to assess the degree that participants hold magic beliefs such as "Some people can make me aware of them just be thinking about me." Magical ideation refers to the tendency to generate false hypotheses about random and illusory contingencies (Brugger & Graves, 1997). As such, belief updating is an antecedent to magical ideation. Barnett and Corballis (2002) confirmed the premise as well as that consistent-handed individuals are generally less prone to magical ideation than inconsistent-handed counterparts.

2.1.5. Barnum Effect

As another way to tap into belief updating, we measured participants' susceptibility to the Barnum Effect (Dickson & Kelly, 1985; Forer,