



Brief report

On the nature of implicit soul beliefs: When the past weighs more than the present

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Intuitive childhood beliefs in dualism may lay the foundation for implicit soul and afterlife beliefs, which may diverge from explicit beliefs formed later in adulthood. Brief Implicit Association Tests were developed to investigate the relation of implicit soul and afterlife beliefs to childhood and current beliefs. Early but not current beliefs covaried with implicit beliefs. Results demonstrated greater discrepancies in current than in childhood soul and afterlife beliefs among religious groups, and no differences in implicit beliefs. These findings suggest that implicit soul and afterlife beliefs diverge from current self-reported beliefs, stemming instead from childhood beliefs.

In a clever experiment, participants were asked to sign a contract agreeing to sell their soul to the experimenter for two dollars. Nearly all participants refused, even though they were told the contract was fake and would be shredded after they signed it (Graham, Haidt, & Nosek, 2009; see also, Preston, Ritter, & Hepler, 2013). When challenged to justify their reasoning, participants could not. Their intuitions had no reason. The goal of the present research was to examine the source of these automatic, intuitive – implicit – soul beliefs.

From where might implicit soul beliefs emerge? Developmental research suggests that cognitive defaults used early in childhood predispose people to believe in supernatural phenomena such as the soul and afterlife (Bloom, 2007; Uhlmann, Poehlman, & Bargh, 2008). Children as young as four recognize that biological states discontinue after death (Bering & Bjorklund, 2004). However, young children believe that psychological states persist. The discrepancy in children's beliefs about biological and psychological functioning after death may lay the foundation for implicit soul and afterlife beliefs; the body dies, but a nonmaterial entity continues to exist.

Implicit soul and afterlife beliefs may persist into adulthood, even among those who explicitly deny the existence of the supernatural. In a recent study, religious and non-religious participants were primed with death and then completed explicit and implicit measures assessing their belief in supernatural entities (e.g., God; Jong, Halberstadt, & Bluemke, 2012). Following mortality salience, both groups *explicitly* defended their respective worldviews: religious participants more strongly affirmed the existence of supernatural entities, and non-religious participants more strongly denounced their existence. However, all participants primed with death showed stronger

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implicit beliefs in the supernatural, suggesting that even non-religious individuals hold implicit supernatural beliefs that they may cling to when reminded of their mortality.

People do not need to be reminded of death to exhibit implicit religious beliefs. In one study, participants explicitly reported a preference for evolutionary theory over creationism but implicitly showed a preference for creationism (Nosek, 2007). Such dissociations between explicit and implicit beliefs and attitudes are not uncommon (Dovidio, Kawakami, & Beach, 2001). In fact, a meta-analysis examining the correspondence between Implicit Association Tests (IATs) and explicit measures across 184 samples found a mean $r = .24$ (Greenwald, Poehlman, Uhlmann, & Banaji, 2009).

Implicit and explicit beliefs may diverge because implicit beliefs are automatic, effortless, and guided by intuitions, whereas explicit beliefs are deliberative, slower to produce, and more likely to be guided by analytic thinking (e.g., Strack & Deutsch, 2004). Research suggests that relying on intuitive thinking strengthens religious beliefs, whereas using analytic thinking increases religious doubt (Gervais & Norenzayan, 2012; Shenhav, Rand, & Greene, 2011). For example, Shenhav *et al.* (2011) found that participants who gave more intuitive (vs. analytic) responses on a cognitive reflection test reported holding stronger soul beliefs and having strengthened their belief in God since childhood. In addition, participants who were induced to think intuitively reported stronger religious beliefs than those primed to think analytically (Shenhav *et al.*, 2011). Therefore, implicit soul and afterlife beliefs may be based on intuitions, which may diverge from more reasoned explicit beliefs.

Implicit and explicit soul and afterlife beliefs may also differ because they originate from different sources (Rudman, 2004). Implicit attitudes may stem from early, affective experiences during childhood, whereas explicit attitudes may stem from recent experiences (Devine, 1989; Greenwald & Banaji, 1995; Rudman, 2004; Wilson, Lindsey, & Schooler, 2000). In support of this theory, Rudman, Phelan, and Heppen (2007) found that participants whose mothers were overweight when they were young automatically preferred heavyweight to slim people. Further, they found that smokers' early experiences with smoking predicted their implicit attitudes towards smoking, whereas their recent experiences with smoking predicted their explicit attitudes. A similar pattern emerged for attitudes towards dreams. Considering the evidence suggesting a developmental basis for implicit soul and afterlife beliefs, it would seem likely that implicit soul and afterlife beliefs stem from early childhood beliefs, which may not correspond to individuals' current beliefs.

In a seeming contradiction of this hypothesis, Castelli, Carraro, Gawronski, and Gava (2010) found that participants' recent religious experiences covaried with their implicit evaluations of religious symbols, whereas their early religious experiences did not. The authors theorized that the link between early experiences and implicit evaluations only appears when early experiences are more affective than recent experiences. Castelli *et al.* attempted to control for affectivity by examining implicit and explicit evaluations of religion, an attitude object presumed to be associated with affective experiences in the present and past.

However, the authors used an IAT that contrasted pictures representing 'Religion' (e.g., cross and priest) with pictures representing 'Not religion' (e.g., pineapple and coffeemaker). Negations should be avoided in implicit measures because they are difficult to process (Rudman, 2011). Furthermore, this IAT did not contain a coherent contrast category. Most people automatically prefer coherent categories to chaotic ones (Rudman, 2011), and those who are currently involved in their church and religion may especially show this preference. In fact, research suggests that religious people are more

conservative than non-religious individuals, and conservatism is associated with a need for structure (Jost, Glaser, Kruglanski, & Sulloway, 2003).

Overview of current study

Therefore, the present study tested the relationship between attitudes towards religious concepts and early (vs. recent) experiences using a less relative instrument. The brief-IAT (B-IAT) was chosen because of its robust psychometric properties (Bar-Anan & Nosek, 2012; Sriram & Greenwald, 2009). Evaluative beliefs about the soul (whether it exists and whether it persists after death) were measured because these beliefs are affective in nature and develop in early childhood (Bloom, 2007).

B-IATs were developed to assess implicit soul and afterlife beliefs. Along with completing these implicit measures, participants retrospectively reported their childhood soul and afterlife beliefs and reported their current beliefs. Based on prior theorizing and research (Rudman, 2004; Rudman *et al.*, 2007), the B-IATs were expected to be more strongly associated with childhood than current beliefs.

Method

Participants

A total of 349 students (236 women, 112 men, 1 unreported; $M_{\text{age}} = 18.41$) from the psychology subject pool at Rutgers University, participated in this study. Of these, 41.3% identified as Christian, 14.9% as Hindu, 14.0% as Other, 9.5% as Agnostic, 6.9% as Muslim, 6.6% as Atheist, 4.3% as Jewish, and 2.6% as Buddhist.

Materials

Soul and afterlife B-IATs (Sriram & Greenwald, 2009)

For the soul B-IAT, the focal category *Soul* was presented on the top centre of the screen during a training phase, and participants distinguished *Soul* stimuli (Soul, Spirit, Inner Being, Essence) from the background stimuli (Machine, Robot, Android, Computer) using the P and Q keys on the computer. During the critical phase, participants categorized both *Soul* and *Real* stimuli as focal (and all other stimuli as background) for a block of 21 trials, and *Soul* and *Fake* stimuli as focal (and all other stimuli as background) for another block of 21 trials (these blocks were counterbalanced). The first trial of each block was included as a practice trial and was not analysed. *Real* stimuli consisted of the words existing, real, alive, and true, and *Fake* stimuli consisted of the words phony, fake, false, and artificial. These critical blocks were then repeated for a second time to increase reliability ($\alpha = .95$; Sriram & Greenwald, 2009).

The afterlife B-IAT also used *Soul* as the focal category, but the background stimuli consisted of Body, Flesh, Skin, and Muscle. For this measure, *Soul* was categorized with *Eternal* stimuli (i.e., everlasting, forever, eternal, and survive) for 21 trials and with *Death* stimuli (i.e., perish, death, die, fatal) for 21 trials (these blocks were counterbalanced, and as before, the first trial of each block was included as practice). The critical blocks were then repeated to increase reliability ($\alpha = .94$). The presentation of the soul and afterlife B-IATs was also counterbalanced.

For each trial, when participants responded incorrectly, a red X appeared in the centre of the screen until participants corrected their error. Implicit soul and afterlife belief

D-scores were calculated by computing the average standardized mean difference in response latencies for the critical blocks, such that higher scores indicated stronger implicit beliefs (Greenwald, Nosek, & Banaji, 2003).

Childhood and current beliefs

Participants reported whether they believed humans had souls and in an afterlife when they were 5, 10, and 15 years old and whether they currently believe humans have souls and in an afterlife. These items were rated on 9-point scales ranging from 1 (*Do(Did) not believe so*) to 9 (*Strongly believe(d) so*).

Procedure

The study was advertised as a study of 'Beliefs about Human Nature'. Participants first completed the B-IATs. Then, they reported their childhood beliefs, rated their religiosity and political orientation on 7-point scales (with higher scores representing greater religiosity and a stronger liberal ideology), and reported their demographic information.

Disclosure statement

All conditions and data exclusions are included in this report. Following the primary measures of interest reported above, participants completed five exploratory measures (several of which were unvalidated measures, with poor psychometric properties). Due to the brief nature of this report (and because these measures were not central to the hypotheses of the study), these measures are not included here.

Because reaction time data are noisy and previous research has shown weak to moderate correspondence between implicit and explicit measures (Greenwald *et al.*, 2009), a large sample size was sought for this study. Data were collected for as many participants as possible during the first 6 weeks of the semester.

Results

Preliminary analyses

Data reduction

Although participants were asked to report their beliefs in the soul and afterlife at age 5, research suggests that most adults have trouble recalling memories at such a young age (Bauer, Wenner, & Kroupina, 2002; Nelson & Fivush, 2004). Because it is unclear whether participants accurately recalled their beliefs at this young age, beliefs at 10 were used as the focal measure of childhood beliefs for all analyses. (Beliefs at 15 seemed too recent to be considered a measure of childhood beliefs). Correlations among beliefs at 5, 10, 15, and present are reported in Table 1 for interested readers.

Descriptive statistics

One-sample *t*-tests with zero as the test value indicated that participants categorized *Soul* stimuli with *Real* stimuli more quickly than *Soul* stimuli with *Fake* stimuli ($D = .30$, $SD = 0.34$), $t(348) = 16.44$, $p < .001$, and *Soul* stimuli with *Eternal* words more quickly than *Soul* stimuli with *Death* words ($D = .18$, $SD = 0.33$), $t(348) = 9.89$, $p < .001$.

Table 1. Correlations among implicit and explicit measures

	1	2	3	4	5	6	7	8	9	10	11
1. Soul B-IAT	—										
2. Afterlife B-IAT	0.26*	—									
3. Soul beliefs at 5	0.12*	0.08	—								
4. Soul beliefs at 10	0.17*	0.12*	0.81*	—							
5. Soul beliefs at 15	0.12*	0.13*	0.43*	0.68*	—						
6. Current soul beliefs	0.07	0.08	0.19*	0.41*	0.75*	—					
7. Afterlife beliefs at 5	0.11*	0.08	0.63*	0.53*	0.28*	0.11*	—				
8. Afterlife beliefs at 10	0.15*	0.13*	0.53*	0.64*	0.47*	0.34*	0.79*	—			
9. Afterlife beliefs at 15	0.13*	0.11*	0.25*	0.45*	0.66*	0.70*	0.27*	0.61*	—		
10. Current afterlife beliefs	0.12*	0.08	0.16*	0.35*	0.60*	0.77*	0.15*	0.44*	0.87*	—	
11. Religiosity	0.00	0.01	0.16*	0.28*	0.44*	0.49*	0.14*	0.28*	0.52*	0.56*	—
12. Political orientation	-0.05	0.05	-0.06	-0.06	-0.06	-0.09	-0.09	-0.08	-0.12*	-0.15*	-0.15*

Note. Higher political orientation scores represent a stronger liberal political ideology.

B-IAT = Brief Implicit Association Tests.

* $p < .05$.

See Table 1 for correlations among the implicit and explicit measures. The B-IATs correlated with each other, $r(347) = .26$, $p < .001$, providing evidence of their convergent validity. However, B-IAT scores were unrelated to religiosity (soul B-IAT: $r = .00$, $p = .93$; afterlife B-IAT: $r = .01$, $p = .83$), and did not statistically differ by religious group (soul B-IAT: $F = 1.68$, $p = .11$; afterlife B-IAT: $F = 0.83$, $p = .57$).

Overall, participants reported moderately strong childhood ($M = 6.47$, $SD = 2.12$) and current soul beliefs ($M = 7.26$, $SD = 2.30$), and childhood ($M = 6.59$, $SD = 2.30$) and current afterlife beliefs ($M = 6.72$, $SD = 2.60$). Paired samples t -tests revealed that participants' current soul beliefs were statistically stronger than their childhood soul beliefs, $t(347) = -6.13$, $p < .001$, whereas their childhood and current afterlife beliefs did not statistically differ in strength, $t(347) = -0.99$, $p = .33$.

Religiosity was moderately positively correlated with childhood soul and afterlife beliefs, and strongly positively correlated with current soul and afterlife beliefs (see Table 1). There were significant differences in childhood soul, $F = 5.12$, $p < .001$, and afterlife beliefs, $F = 5.09$, $p < .001$, and current soul, $F = 21.16$, $p < .001$, and afterlife beliefs, $F = 25.64$, $p < .001$, among religious groups (see Table 2). Muslim participants reported the strongest current soul and afterlife beliefs, whereas Atheist participants reported the weakest current beliefs (see Table 2). Furthermore, mixed-model ANOVAs with belief as a within-subject factor (childhood vs. current) and religious group as a between-subject factor indicated greater discrepancies in current than in childhood soul, $F = 6.88$, $p < .001$, and afterlife beliefs, $F = 8.13$, $p < .001$, among religious groups (see Table 2).

Developmental sources of implicit beliefs

Soul B-IAT

Linear regressions were conducted to test the main hypotheses concerning the relationship between early and current beliefs and B-IAT scores. When soul B-IAT scores were regressed on early and current soul beliefs, the overall model was significant, $F(2, 345) = 5.20$, $p = .006$, $R^2 = .03$. Early soul beliefs predicted participants' soul B-IAT

Table 2. Self-reported childhood and current soul and afterlife beliefs according to religious group

	N	Childhood soul beliefs		Current soul beliefs		Childhood afterlife beliefs		Current afterlife beliefs	
		M	SD	M	SD	M	SD	M	SD
Christian	144	6.98	1.90	8.03	1.59	7.10	2.36	7.78	1.82
Hindu	52	6.10	2.03	7.52	1.81	6.31	2.04	6.85	2.21
Other	49	6.33	2.32	6.98	2.23	6.39	2.10	6.06	2.38
Agnostic	32	5.75	2.29	5.44	2.56	5.59	2.26	4.06	2.60
Muslim	24	7.58	1.59	8.92	0.41	7.92	1.74	8.79	1.02
Atheist	23	5.57	2.31	3.74	3.11	5.48	2.19	3.26	2.93
Jewish	15	5.27	1.98	6.73	2.05	5.93	2.43	5.60	2.56
Buddhist	9	5.11	2.09	6.78	2.05	5.00	1.87	7.33	1.94

Note. Childhood and current beliefs were rated on 9-point scales, with higher values representing stronger beliefs in the soul and afterlife. Childhood beliefs reflect retrospectively reported beliefs at 10 years of age.

scores, $\beta = .17$, $B = .03$, $SE = .01$, $t = 2.98$, $p = .003$, such that those who reported believing in the soul more strongly during childhood had higher soul B-IAT scores (see Table 1). In contrast, current soul beliefs did not predict soul B-IAT scores, $\beta = -.01$, $B = .00$, $SE = .01$, $t = -0.10$, $p = .92$.

This model remained significant when controlling for age, gender, and religiosity, $F(5, 342) = 2.85$, $p = .015$, $R^2 = .04$. Early soul beliefs was the only significant predictor of soul B-IAT scores, $\beta = .20$, $B = .03$, $SE = .01$, $t = 3.31$, $p = .001$.

Afterlife B-IAT

The overall model was significant when afterlife B-IAT scores were regressed on early and current afterlife beliefs, $F(2, 345) = 3.21$, $p = .04$, $R^2 = .02$. Early afterlife beliefs predicted afterlife B-IAT scores, $\beta = .12$, $B = .02$, $SE = .01$, $t = 2.03$, $p = .04$, such that stronger early afterlife beliefs were associated with stronger afterlife B-IAT scores (see Table 1). Current afterlife beliefs did not predict afterlife B-IAT scores, $\beta = .03$, $B = .00$, $SE = .01$, $t = 0.47$, $p = .64$.

When controlling for age, gender, and religiosity, the overall model was marginally significant, $F(5, 342) = 2.04$, $p = .07$, $R^2 = .03$, and early afterlife beliefs remained the only significant predictor of afterlife B-IAT scores, $\beta = .14$, $B = .02$, $SE = .01$, $t = 2.31$, $p = .02$.

Composite

To provide an overall test of the relationship of early and current beliefs with implicit beliefs, composite measures of early, current, and implicit beliefs were created by averaging the soul and afterlife measures for each variable. Implicit beliefs were then regressed on early and current beliefs. The overall model for this analysis was significant, $F(2, 345) = 7.17$, $p = .001$, $R^2 = .04$. Early beliefs predicted participants' B-IAT scores, $\beta = .18$, $B = .02$, $SE = .01$, $t = 3.09$, $p = .002$, such that stronger early beliefs were associated with stronger implicit beliefs. Current beliefs did not predict participants' B-IAT scores, $\beta = .03$, $B = .00$, $SE = .01$, $t = 0.56$, $p = .58$.

Controlling for age, gender, and religiosity, the overall model remained significant, $F(2, 342) = 4.33$, $p = .001$, $R^2 = .06$, and early, $\beta = .21$, $B = .03$, $SE = .01$, $t = 3.56$, $p < .001$, but not current, $\beta = .06$, $B = .01$, $SE = .01$, $t = 0.90$, $p = .37$, beliefs remained a significant predictor of implicit beliefs.

Discussion

The results from this study provide preliminary evidence suggesting that implicit soul and afterlife beliefs converge with early childhood beliefs but diverge from current explicit beliefs. Early (but not current) beliefs covaried with participants' soul and afterlife B-IAT scores. In addition, results demonstrated greater discrepancies in current soul and afterlife beliefs than in childhood beliefs among religious groups, further suggesting that believing in these phenomena may be a developmental regularity that occurs across religious groups (Bering & Bjorklund, 2004; Bloom, 2007; Uhlmann *et al.*, 2008).

In this study, participants reported stronger soul beliefs in adulthood than in childhood, but equally strong afterlife beliefs during each time period. These findings may be attributed to the fact that the concept of the soul is more complex and abstract than the

concept of the afterlife. Adults may recognize that they intuitively believed in the soul as children but consider their childhood beliefs weaker than their current beliefs because they could not articulate their beliefs as children.

The results from this study are consistent with Rudman *et al.* (2007), providing support for the theory that implicit associations are shaped by early rather than recent experiences (Rudman, 2004). However, these findings are inconsistent with those observed by Castelli *et al.* (2010), who found that participants' implicit evaluations of religious symbols predicted their recent but not early experiences with religion. Due to these discrepant findings, future research is critical to increasing our understanding of how early and recent experiences shape implicit beliefs and attitudes.

Implications

At present, few studies have investigated how religious beliefs develop, change, and persist across childhood, adolescence, and adulthood. In particular, beliefs in the soul and afterlife, though widespread, have received little empirical attention (Bloom, 2007; Uhlmann *et al.*, 2008). Researchers have developed measures of afterlife beliefs, but they have only done so using self-report questionnaires (e.g., Burris & Bailey, 2009; Osarchuk & Tatz, 1973). The present study is the first attempt to assess soul and afterlife beliefs implicitly.

There are several important implications of this research. For example, intuitive soul and afterlife beliefs formed early in childhood may influence adulthood beliefs and attitudes concerning related social and political issues. Future research is needed to determine whether implicit soul beliefs influence attitudes towards social, political, and moral issues, such as capital punishment, animal rights, creationism, genetic testing, and stem cell research. Research on this topic may provide new insight into several issues that are pertinent in our society today.

Future research should also investigate the malleability of implicit soul and afterlife beliefs. For example, mortality salience may strengthen individuals' implicit soul and afterlife beliefs, as Jong *et al.* (2012) found for supernatural entities. Obtaining further evidence demonstrating that mortality salience strengthens implicit religious beliefs, regardless of explicitly held beliefs, may help resolve some of the inconsistencies in the literature surrounding the effects of mortality salience on religious beliefs (e.g., Burling, 1993; Norenzayan, Dar-Nimrod, Hansen, & Proulx, 2009; Osarchuk & Tatz, 1973).

Limitations and directions for future research

While the current study presents novel methods of assessing soul and afterlife beliefs, the results from this research are tentative and require further investigation. A limitation to this study's design was that childhood beliefs were assessed by having participants retrospectively report their early beliefs. This approach is practical for initially testing the early versus recent sources of implicit beliefs and attitudes. However, it is difficult if not impossible to draw firm conclusions about the developmental sources of implicit beliefs from retrospective accounts. Participants may have provided similar responses to the questions assessing their childhood and current beliefs because of their successive presentation. Future research should separate these items in order to reduce multicollinearity. Moreover, in order to elucidate the underlying sources of implicit beliefs and attitudes, additional research examining the relationship between implicit beliefs and early versus current explicit beliefs is necessary across a variety of domains (e.g., various

religious and moral beliefs, stereotypes, etc.). Of course, longitudinal studies, though cumbersome, would provide the most accurate and sensitive tests of the sources of implicit attitudes and their relationship to explicit attitudes over time.

This research was also limited by its use of a convenience sample of American college students. The results observed in the present study may not generalize across age groups, nations, and religious groups. Though beliefs in the soul and afterlife are pervasive across cultures (Halman *et al.*, 2008), discrepancies do exist, and it is possible that implicit beliefs develop differently cross-culturally. Future research should investigate cross-cultural similarities and differences in the relation of implicit beliefs to early and current soul and afterlife beliefs.

More generally, additional evidence is needed to determine whether B-IATs can be used to accurately assess implicit beliefs. The B-IATs developed in this research may have measured other implicit associations than those intended. For example, participants' automatic associations of the soul with real rather than fake stimuli may reflect a general importance or positive valence ascribed to the soul rather than an underlying belief about its existence. Though implicit measures have been applied to a range of phenomena (e.g., Jong *et al.*, 2012; Nosek, 2007; Rudman & Mescher, 2012; Uhlmann *et al.*, 2008), it is important to examine exactly what such implicit measures are assessing and what implicit measures are capable of assessing.

Conclusion

The present study combines theory and research on a wide range of topics, spanning cognitive development, religion, and implicit theory and measurement. Results suggest that implicit soul and afterlife beliefs have a developmental basis and emphasize the importance of future research on the development, structure, and function of religious beliefs.

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