

Supplement: Origins of Disbelief

*Will M. Gervais**

Maxine B. Najle†

Sarah R. Schiavone‡

Nava Caluori§

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*University of Kentucky, Psychology, will.gervais@gmail.com

†BlueLabs Analytics, Washington, D.C.

‡University of California-Davis, Psychology

§University of Virginia, Psychology

The Preregistration

We preregistered a series of analyses. Here, we lay out models and model summaries for all of these analyses.

Here's what we preregistered:

“We will perform a series of 7 confirmatory tests on the full sample. Each model will be run twice: first with no covariates, then including age, gender, politics, education, & personality as covariates.”

This entails a series of models:

1. Does each factor independently replicate?

1. We will replicate mentalizing in a model with mentalizing (linear and quadratic terms) predicting religion.
2. We will replicate motivation in a model with the motivation items predicting religion.
3. We will replicate cultural learning in a model with CREDs predicting religion.
4. We will replicate cognitive style in a model with the CRT predicting religion.

2. Relative contributions?

5. We will run a model with all four factors predicting religion.

3. Specific hypothesized interactions?

6. To test whether cognitive style's effects differ across cultural learning, we will have a model in which CRT, CREDs, and their interaction predict religion.
7. To test the hypothesis that mentalizing is especially important in the context of cultural learning and motivation, we will have a model with mentalizing, CREDs, motivation and the mentalizing-by-CREDs and mentalizing-by-motivation interaction terms predicting religion.

The main manuscript summarizes: our full model (all four primary predictors plus covariates), a binary full model, the cultural learning-by-cognitive reflection interaction with covariates, and zero-order replication analyses. Here, we spell out preregistered analyses not already included.

Departure from preregistration

We initially preregistered inclusion of quadratic terms for mentalizing to test for the possibility that only extreme low advanced mentalizing is associated with disbelief. After the preregistration but before data

41 collection and analysis, we realized that the polynomial approach was a very poor test of this idea and
42 invites model overfitting¹. The preregistered models including a quadratic for mentalizing were theoretically
43 dubious and statistically naive, so we left them out of main analyses. We checked a few of the primary models
44 to see if inclusion of a quadratic did much. It did not. Information criteria (WAIC) suggested that models
45 were always better without a quadratic term for mentalizing, and the quadratic term itself never amounted
46 to much. Additional exploration about a possible low-end mentalizing blip in atheism may warrant future
47 research with a statistically appropriate model.

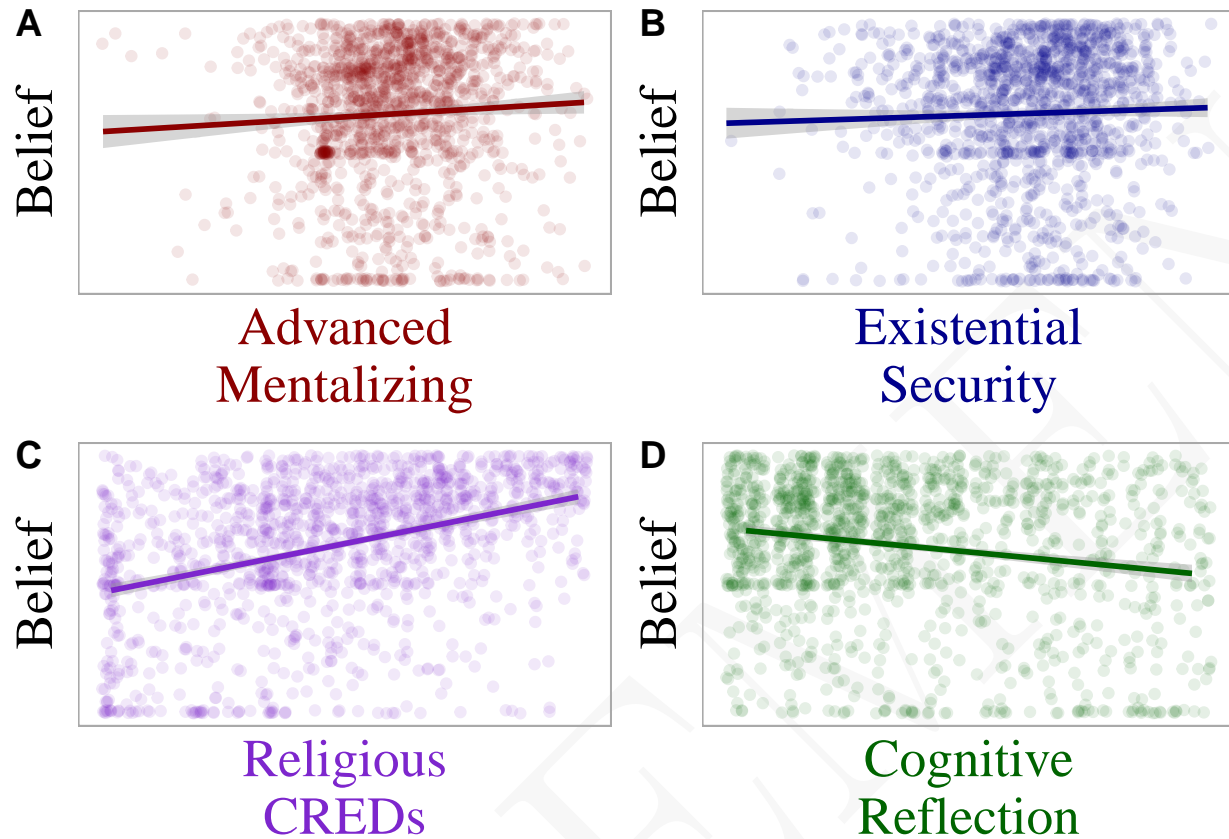


Figure 1: Scatterplots for individual replication models

1. Individual Replications

As the models without covariates are already summarized in the main document, here is the summary for each model including covariates. Nothing much changes from the main models reported in the main paper. inCREDulous atheism and analytic atheism still replicate soundly, and mindblind atheism is also fairly evident. Apatheism is still essentially absent. Table 1 summarizes the individual replication results.

Figure 1 displays scatterplots of each individual analysis.

Table 1: Predicting Disbelief: Individual Replication Analyses With Covariates

Variable	Beta	HPDI	Pr
mindblind	0.06	[0, 0.13]	0.98
apatheism	-0.01	[-0.07, 0.06]	0.4
inCREdulous	0.29	[0.23, 0.34]	>0.99
analytic	0.13	[0.06, 0.19]	>0.99

Note:

¹ Beta = standardized beta

² HPDI = 97% Highest posterior density interval

³ Pr = posterior probability of Beta > 0

Table 2: Full Model, No Covariates

Variable	Beta	HPDI	Pr
mindblind	0.03	[-0.02, 0.09]	0.87
apatheism	-0.03	[-0.09, 0.02]	0.1
inCREdulous	0.38	[0.33, 0.43]	>0.99
analytic	0.22	[0.16, 0.27]	>0.99

Note:

¹ Beta = standardized beta

² HPDI = 97% Highest posterior density interval

³ Pr = posterior probability of Beta > 0

2. Relative Contributions

The main document includes a full model with all key predictors and covariates predicting disbelief. Here, we report the model sans covariates for completeness with the preregistration. Again, not much changes. In this case, mindblind atheism appears even less important. Table 2 summarizes this model.

3. Interactions: Mindblind Atheism

We pursued speculation that mindblind atheism might be especially pronounced in contexts in which other pathways to atheism are muted. If this is the case, for example, then we might expect interactions between mindblind atheism and both cultural exposure to religion and existential security, such that mindblind atheism would be more evident among people relatively higher in religious CREDs or lower in existential security. Alas, we didn't find much of any interactions between mindblind atheism and inCREDulous atheism, $\beta = 0$, $[-0.05, 0.05]$, $P(\beta > 0 \mid data) = 0.49$ or with apatheism, $\beta = 0.02$, $[-0.03, 0.07]$, $P(\beta > 0 \mid data) = 0.84$. This is in a sense unsurprising because mindblind atheism was not especially robust across alternative models throughout this project.

References

1. McElreath, R. *Statistical Rethinking: A Bayesian Course with Examples in R and Stan.* vol. 122 (CRC Press, 2016).