Supplementary Materials for "Buddha as a god: An empirical assessment"

Benjamin Grant Purzycki*
Department of Human Behavior, Ecology and Culture
Max Planck Institute for Evolutionary Anthropology
Deutscher Platz 6
04103 Leipzig, Deutschland

Edward C. Holland
Department of Geosciences
119 Gearhart Hall
University of Arkansas
Fayetteville, AR 72701

*contact author email: benjamin_purzycki@eva.mpg.de

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S1. Interview materials in Tyvan and English

Opening and Consent

Tyvan (T):
Мээң/бистиң-биле ужуражып келгениңер дээш улуу-биле четтирдим. Силерниң чуртталагаңарда сонуургалдарыңар база бүзүреп чоруур чүүлдериңер дугайында каш айтырыг салыксап тур мен. Бир эвес ол айтырыгларның кайы-бирээзинге харыылаксавайн турар болзуңарза, ол айтырыгны харыы чок эртириптерин дилеп болур силер. Интервьюну кузээн үенерде доозуптарын база дилеп болур силер. Силерге айтырыгларымны ам салып болур мен бе?

English (E):
Thanks for coming today for my/our meeting. I'd like to ask you some questions about your life preferences, customs, and beliefs. If there is any question you don't want to answer, you may tell us to skip it. Also you can stop the interview at any moment you'd like to. Can I ask you some questions?

Questions

1) T: Билириңер шупту бурганнар азы сүнезиннерни (чер, суг, даг ээлерин) сактып данзылап бижиңер. Хөй-ле дизе 5.
   E: Please, list all the gods and spirits that you can remember/have in your mind (e.g., place, water, mountain masters). Make a list. Maximum of 5.

2) T: Силерниң чуртталганарга хамаарыштыр данзыда айыткан бурганнар азы сүнезиннер (чер, суг, даг ээлери) кандыг рольду ойнап турарыл, эң чугулазындан шоолуг хамаарылгы чок деп эвээжеп бар чыдар талаже демдегленер.
   E: Rank them in terms of their importance in your life, starting with the most important ones and ending with the most insignificant. Who is the most important in your life?

3) T: Кижилерниң чүү канчап турарынын дугайында азы боттарын канчаар алдынып чоруурунун дугайында _____ сагыш човап чоруур бе?
   E: Does _____ worry about what people do and the way they behave?

4) T: _____ кижилерниң угаан-медерелин оттур коруп шыдаар бе азыоларның бодалдарын, сагыш-сеткилин билир бе?
   E: Can _____read minds or know about people's feelings or what they think?

5) T: _____ ооң сеткилинге таарышпас кылдыр бодун алдынып чоруур улустарны кезедип хемчээп шыдаар бе?
   E: Does _____ punish people that behave ill from his point of view?

6) Т: _____ ооң сеткилинге тааржыр кылдыр бодун алдынып чоруур улустарны шаннаар бе?
E: Does _____ reward people that behave well from his point of view?

S2. Free-List codes for gods' dislikes and likes

1. **Morality**: generalized behaviors that have a benefit or cost to other people (e.g., hurting, being generous, sharing, etc.)
2. **Virtue**: individual qualities that may or may not have social ramifications (e.g., hard-working, kind, bad conscience, etc.)
3. **People**: in reference to the quality, and/or the state of people (e.g., people, people stay in good health, happy, etc.)
4. **Etiquette**: conventional social behaviors that have no immediate cost or benefit to others (e.g., shaking hands, wearing the proper clothes, etc.)
5. **Substance Use/Abuse**: Items that involve the use of intoxicating substances
6. **Religion**: any non-ritual or non-behavioral item concerned with the supernatural (e.g., faith, devotion, loving god, etc.)
7. **Ritual**: any behavior or object used in ritual devoted to the supernatural (e.g., praying, meditation, offerings, sacrifices, not participating in ritual, etc.)
8. **Ecology**: any behavior or object affecting non-human relationships (e.g., pollution, keeping sacred places clean, gardening, etc.)
9. **Food**: any item composed of food items (e.g. Yam, Milk, etc.)
10. **Miscellaneous**: miscellaneous items, items that cross-cut categories, etc.
11. **D/K**: I don't know, not sure, etc.
12. **Specific**: Items that are specific to a culture [items not immediately understood by coders]
13. **NA**: No data

S3. Descriptive statistics for gods free-list

Table S1. Freely-listed deities in the Tyva Republic.

Deity	n	% Sample	% Items	M Salience	S Salience	Smith's S	Deity	n	% Sample	% Items	M Salience	S Salience	Smith's S
Buddha	18	0.69	0.15	0.77	13.86	0.53	**fire *eezi***	3	0.12	0.03	0.28	0.85	0.03
Jesus	12	0.46	0.10	0.63	7.51	0.29	***Dorzhu***	1	0.04	0.01	0.80	0.80	0.03
place/territory *eezi*	9	0.35	0.08	0.74	6.63	0.26	**Aita**	2	0.08	0.02	0.40	0.80	0.03
water *eezi*	8	0.31	0.07	0.57	4.52	0.17	**natural spring *eezi***	1	0.04	0.01	0.80	0.80	0.03
Shakyamuni	5	0.19	0.04	0.80	4.00	0.15	**Dalai-Lama**	2	0.08	0.02	0.40	0.80	0.03
***Nogaan Darigi* (Green Tara)**	5	0.19	0.04	0.53	2.64	0.10	**Holy Spirit**	1	0.04	0.01	0.80	0.80	0.03
Zeus	3	0.12	0.03	0.78	2.35	0.09	**Dionysus**	1	0.04	0.01	0.78	0.78	0.03
Allah	5	0.19	0.04	0.43	2.14	0.08	**Poseidon**	2	0.08	0.02	0.39	0.77	0.03
***Ochurbani* (Vajrapani)**	2	0.08	0.02	0.90	1.80	0.07	**Krishna**	2	0.08	0.02	0.34	0.69	0.03
mountain *eezi*	3	0.12	0.03	0.50	1.51	0.06	**Ares**	1	0.04	0.01	0.67	0.67	0.03
house *eezi*	4	0.15	0.03	0.36	1.45	0.06	**Ganesha**	1	0.04	0.01	0.60	0.60	0.02
Manjusri	3	0.12	0.03	0.47	1.40	0.05	**river *eezi***	1	0.04	0.01	0.60	0.60	0.02
angel	2	0.08	0.02	0.65	1.30	0.05	**forest *eezi***	1	0.04	0.01	0.60	0.60	0.02
Mohammed	2	0.08	0.02	0.60	1.20	0.05	**God the Father**	1	0.04	0.01	0.60	0.60	0.02
Tengri	1	0.04	0.01	1.00	1.00	0.04	**Aphrodite**	1	0.04	0.01	0.43	0.43	0.02
taiga *eezi*	1	0.04	0.01	1.00	1.00	0.04	**Geo**	1	0.04	0.01	0.40	0.40	0.02
tos deer dolaan burgan	1	0.04	0.01	1.00	1.00	0.04	***Kongar***	1	0.04	0.01	0.40	0.40	0.02
azalar	2	0.08	0.02	0.50	1.00	0.04	***Chedi-Xaan* (7 kings)**	1	0.04	0.01	0.25	0.25	0.01
Arbyvala	1	0.04	0.01	1.00	1.00	0.04	**Apollo**	1	0.04	0.01	0.20	0.20	0.01
Neptune	1	0.04	0.01	1.00	1.00	0.04	**man as god**	1	0.04	0.01	0.20	0.20	0.01
***Namzyrai* (Bisman)**	2	0.08	0.02	0.48	0.95	0.04	**Ahura Mazda**	1	0.04	0.01	0.20	0.20	0.01

Note. n = number of people listing items; % Sample = proportion of total sample listing category; % Total items = proportion of total items listed; M Salience = mean of item salience; S Salience = sum of salience scores; Smith's S = sum of salience scores divided by sample size. Salience scores calculated using the AnthroTools package (Jamieson-Lane and Purzycki 2016) for R (R Core Team 2016). "*Eezi*" are local spirits-masters.

S4. Model definition

The full model in the main text is defined as follows:

$$y_i \sim \text{Binomial}(1, p_i)$$
$$\text{logit}(p_i) = \alpha + \beta_i X_i$$
$$\alpha = \alpha_{[i]} + \alpha_{\text{question}[j]} + \alpha_{\text{participant}[k]}$$
$$X_i = \text{sex}_{[i]} + \text{education}_{[i]} + \text{age}_{[i]} + \text{material insecurity}_{[i]} + \text{number of children}_{[i]}$$

where y_i is the dichotomous response to questions about Buddha's punishment and knowledge propensities. These were modelled using a binomial probability distribution where p_i is the probability of answering "yes." Across models, intercepts (α) include the answer-level estimate ($\alpha_{[i]}$), intercepts for question $\alpha_{\text{question}[j]}$ and individuals $\alpha_{\text{participant}[k]}$. Individual-level predictors ($\beta_i X_i$) include participant sex, centered-at-mean years of formal education and age, an indicator value of material insecurity, and number of children.

S5. Supplementary analyses

S.5.1. Model definitions

For the sake of robustness checking and model development, we also ported our results into a Bayesian statistical framework. We report here the main model specifications. Similar to the full model in the main text, we varied the effects for individuals and question types. However, models failed to run upon including both of them, indicative of overfitting. We therefore ran a regression as above, but with either $\alpha_{\text{question}[j]}$ or $\alpha_{\text{participant}[k]}$. The model was formally defined as follows:

$$y_i \sim \text{Binomial}(1, p_i)$$
$$\text{logit}(p_i) = \alpha + \beta_i X_i$$
$$\alpha = \alpha_{[i]} + \alpha_{\text{question}[j] \text{ or participant}[k]}$$
$$\alpha \sim \text{Cauchy}(0,2)$$
$$\beta_i \sim \text{Normal}(0,1)$$
$$X_i = \text{sex}_{[i]} + \text{education}_{[i]} + \text{age}_{[i]} + \text{material insecurity}_{[i]} + \text{number of children}_{[i]}$$

We used weakly informative priors and model diagnostics ($\check{R}$ and effective samples) demonstrated that the models sampled well and converged. We fit models using the brms package (Bürkner 2017) for R.

S.5.2. Results

Table S2 includes the results from both model specifications (bfull.q models question types as varying effects and bfull.id models participants as varying effects). Results are qualitatively the same as the full model in the main text (mfull in Table S2). For the sake of comparison, we ran

similar regressions in the frequentist statistical framework (bfull.q and bfull.id). Aside from the estimates of $\alpha_{[i]}$, the estimates of each effect are virtually the same.

Table S2. Results from full models.

Variable	mfull OR [95% CI]	mfull.q OR [95% CI]	mfull.id OR [95% CI]	bfull.q OR [95% CI]	bfull.id OR [95% CI]
Years of Formal Education[a]	0.80 [0.66, 0.97]	0.82 [0.72, 0.95]	0.80 [0.67, 0.97]	0.82 [0.71, 0.94]	0.79 [0.63, 0.96]
Sex (male = 1)	0.55 [0.23, 1.34]	0.60 [0.32, 1.14]	0.55 [0.23, 1.33]	0.64 [0.35, 1.20]	0.61 [0.25, 1.54]
Age[a]	1.03 [0.98, 1.08]	1.03 [0.99, 1.07]	1.03 [0.99, 1.08]	1.03 [1.00, 1.07]	1.03 [0.98, 1.09]
Mat. Insecure? (yes = 1)	0.40 [0.16, 0.98]	0.49 [0.27, 0.90]	0.41 [0.17, 0.98]	0.53 [0.30, 0.93]	0.46 [0.19, 1.07]
Number of Children	1.11 [0.76, 1.64]	1.08 [0.81, 1.46]	1.11 [0.76, 1.63]	1.09 [0.81, 1.49]	1.12 [0.75, 1.74]
Intercept	7.83 [2.95, 20.76]	5.61 [2.77, 11.36]	7.55 [3.03, 18.80]	5.63 [2.17, 15.05]	8.00 [3.23, 22.47]

Note. Model mfull is full model from main text, bfull.q and mfull.q define α as $\alpha_{[i]} + \alpha_{\text{question}[j]}$ while bfull.id and mfull.id define α as $\alpha_{[i]} + \alpha_{\text{participant}[k]}$.

References

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