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Brief article

Identity fusion, outgroup relations, and sacrifice: A cross-cultural test☆

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ABSTRACT

Identity fusion theory has become a popular psychological explanation of costly self-sacrifice. It posits that while maintaining one's own individual identity, a deep affinity with one's group can contribute to sacrifice for that group. We test this and related hypotheses using a behavioral economic experiment designed to detect biased, self-interested favoritism among eight different populations ranging from foragers and horticulturalists to the fully market-integrated. We find that while individuals favor themselves on average, those with higher ingroup fusion sacrifice more money to other members of their ingroup who are unable to reciprocate. We also find that positive outgroup relations has a similar effect. Additionally, we assess a recently-posited interaction between ingroup and outgroup relations and show no consistent effect at the individual or sub-sample levels.

1. Introduction

The theory of identity fusion (Swann & Buhrmester, 2015; Swann, Gómez, Seyle, Morales, & Huici, 2009; Swann, Jetten, Gómez, Whitehouse, & Bastian, 2012) has received considerable attention for its ability to predict self-expressed willingness to sacrifice for one's group. The visceral feeling of oneness perforates the boundaries between individual and group identities, fostering close affinity between group members. In contrast to social identity theory (Tajfel & Turner, 1979), fused individuals' identities are not dissolved by group identity. Rather, because personal and social identities are functionally equivalent, the retention of personal identity while fused motivates people to engage in costly pro-group behavior (Swann, Gómez, Huici, Morales, & Hixon, 2010b; Swann et al., 2012). Recently, Whitehouse (2018) articulated a chain of events where perceived sharedness with groups leads to local fusion which–interacting with outgroup threats–predicts sacrifice.

Empirical support for the theory is growing. In studies using the trolley dilemma, fused Spaniards expressed higher willingness to self-sacrifice in order to save other Spaniards than their less-fused counterparts (Swann, Gómez, Dovidio, Hart, & Jetten, 2010a). Fused individuals are more likely to claim they are willing to fight and die for their country (Swann et al., 2014a; Swann et al., 2014b; Swann et al., 2010a; Whitehouse et al., 2017). Evidence from Iraq (Gómez et al., 2017) and Libya (Whitehouse, McQuinn, Buhrmester, & Swann, 2014) shows that fusion with a fighting band creates strong "brother-like" relationships that are more important than family ties, especially when defending the group's sacred values. Further evidence exists from Morocco and Spain where highly-fused individuals are more likely to claim support for costly sacrifices devoted to jihad and democracy, respectively (Sheikh, Gómez, & Atran, 2012). Regarding the predicted interaction between local fusion and outgroup threat, Fredman, Bastian, and Swann (2017) found that religious fusion among Israelis was a stronger predictor of retaliation against Palestinians during the Stabbing Intifada of 2015 than it was before the intifada.

As identity fusion theory was originally conceived to explain "extreme" behaviors, the bulk of the research focuses on very costly acts of self-sacrifice. If we assume, however, that "extreme" sacrifice is on one end of a cost distribution, fusion could still account for subtler forms of sacrifice. Indeed, some studies suggest this is the case (e.g., Swann et al., 2010b), but the theory does not specify the range of coverage that fusion should have on this distribution. As a consequence of focusing on extreme behavior, some of this work (Swann et al., 2009, 2010a) dichotomizes fusion scales, thus treating fusion and costs of self-sacrifice as trait-like characteristics rather than continuous covariates lying on a spectrum (cf. Gómez et al., 2011; Jiménez et al., 2016; Segal, Jong, & Halberstadt, 2019; Swann et al., 2010b). Moreover, the bulk of the literature considers self-reports of willingness to engage in or support of others' extreme acts rather than actual behaviors. Importantly, this research has largely bypassed sampling from traditional, non-state societies (cf. Swann et al., 2014a).

☆ Short report.

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Table 1
Descriptive features of target variables for each field site. Values are means (standard deviations). ∗When participants were Catholic, the Ingroup and Distant was Catholic while the Outgroup was Evangelical (and vice versa). See Purzycki et al. (2018) and references above for further details and analysis.

N	Site/ingroup	Fusion	Outgroup	Fusion	Coins to self	References
42	Christian Coastal Tannese	4.05 (1.27)	Noumeans	1.74 (1.34)	15.32 (2.51)	Atkinson (2018)
67	Hadza (regional)	4.71 (0.79)	Datoga	1.79 (1.27)	17.82 (4.31)	Apicella (2018)
73	Kastom Inland Tannese	4.56 (0.85)	Noumeans	2.42 (1.87)	15.93 (3.80)	Atkinson (2018)
75	Hindu Indo-Fijians	3.53 (1.47)	Muslim Indo-Fijians	3.07 (1.56)	15.07 (2.96)	Willard (2018)
65	Marajó Brazilians*	3.96 (1.42)	Evang./Cathol.	2.22 (1.58)	15.43 (3.74)	Cohen et al. (2018)
95	Hindu Mauritians	4.38 (0.92)	Muslim Mauritians	2.28 (1.40)	16.30 (3.32)	Xygalatas et al. (2018)
79	Buddhist Tyvans	3.77 (1.47)	Christian Russians	2.25 (1.47)	14.70 (2.95)	Purzycki and Kulundary (2018)
73	Yasawan-Fijians	1.99 (0.26)	Indo-Fijians	1.01 (0.12)	18.39 (4.98)	McNamara and Henrich (2018)

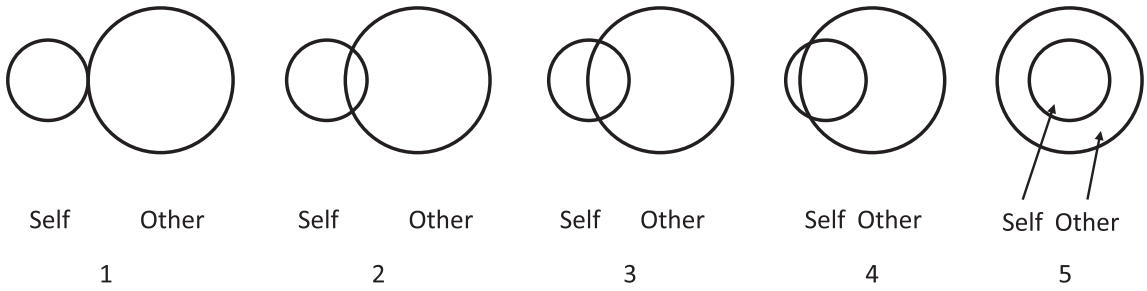

Fig. 1. Pictorial scale for group relations. Scale modified from Swann et al. (2009) which was adapted from Aron et al. (1992) and Schubert and Otten (2002). See supplements for question definitions.

Here, we examine whether or not identity fusion, intergroup relations, and perceived cultural similarity facilitate costly, sacrificial behavior across eight culturally diverse field sites. By considering foregoing self-interested gains through fair impartiality toward members of one's ethnic-religious group as a relatively subtle form of self-sacrifice, we examine whether or not perceived cultural similarity and intergroup relations predict sacrificing money for one's group.

2. Method

To assess the roles fusion and intergroup relations play on sacrifice, we utilize the Evolution of Religion and Morality Project dataset (Purzycki et al., 2016a) that includes data (N = 592) from eight ethnographically diverse field sites (Table 1). Our sample includes Hadza foragers from Tanzania, horticulturalist inland populations from Tanna, Vanuatu, a more market-integrated coastal sample from the same island, Indo- and native Fijians, Tyvans from Siberia, Brazilians from Marajó island, and residents of Porte aux Piment, Mauritius. See Purzycki et al. (2016a) and Table 1 for further details of each subsample.

2.1. Sacrifice

We measure sacrifice with outcomes in a Random Allocation Game (Hruschka et al., 2014; Jiang, 2013; Purzycki et al., 2016b). In this experiment, participants have two cups designated for specific recipients, a fair, two-colored die, and 30 coins. They are supposed to think of which cup they would like to put a coin into and roll the die. If the die comes up one color, they get to put the coin into the cup of which they thought. If it comes up the other color, they put the coin into the *opposite* cup. Regardless of their thoughts or the die roll, the outcome should be random with any given coin having a 50% chance of going to either cup and therefore follow a binomial distribution. However, as participants play alone, they can break the rules and favor one cup over the other. Aggregate deviations from a binomial distribution indicate systematic, rule-breaking favoritism.

In the game reported here, cups were designated for participants and a co-ethnic, co-religionist from a geographically distant community with little to no regular contact with participants. In addition to their show-up fees (~10% a day's wage), participants kept the coins that landed in their cups and researchers distributed the money from the other cup to randomly selected geographically distant individuals. Participants stood to gain from cheating; they played alone and could put more coins into their own cup (30 coins amounted to roughly half a day's average wage in the local economy). Considering all allocations *not* in their own cups were going to other people not capable of reciprocating, playing fairly (or generously) meant actually sacrificing potential gains with virtually no chance of a return.

2.2. Intergroup relations

We measured individuals' relationships with various groups using a standard visual fusion scale (Aron, Aron, & Smollan, 1992; Swann et al., 2009; Schubert & Otten, 2002, Fig. 1). This had the benefit of being comparable across samples that vary in numeracy and literacy. Participants pointed to the image (1 to 5; low to high) best representing how emotionally close they were to: (1) their ingroups, (2) geographically distant co-ethnic, co-religionists, and (3) geographically distant ethnic/religious outgroups.[1] We defined outgroups as "a stranger, non-co-religionist living in a distant (but known) place." Note that relationships with outgroups inevitably varied across sites (e.g., some intergroup relations were indifferent whereas other groups had long-standing and often violent feuds). We also asked how similar participants thought the distant recipients' religious traditions were (−2 to 2). See Table 1 for group-level values of these scales.

2.3. Hypotheses

If ingroup fusion leads to self-sacrifice, participants with higher ratings of ingroup emotional closeness should be more likely to sacrifice money to distant ingroups. Similarly, increased reported religious similarity to recipients ought to decrease the chances of players keeping

[1] While the visual component of the scale was the same across target groups, we reserve using the term "fusion" for only the ingroup measure and characterize the measure for other groups as "relations" for the sake of presentation. See discussion and supplements for further elaboration.

more coins for themselves. Finally, to the extent that low outgroup relations scores indicate hostility, we should expect an interaction effect between ingroup fusion and outgroup relations where low outgroup scores and high ingroup fusion scores should predict sacrificing coins.

3. Model

Here, we: (a) formalize a set of theoretically-focused models that (b) allows the proposed predictors and their interaction to vary across sites (c) in a Bayesian statistical framework that (d) monotonically models scales' effects. We restrict the bulk of our discussion here to four focal model specifications (see supplemental for more and further discussion).

We define our four focal models below (see supplements for further model specifications). Model 1 includes only the effect of ingroup fusion on allocations. Model 2 assesses the effect of outgroup relations. Model 3 includes the interaction between ingroup and outgroup scores, and Model 4 is the full model that includes ingroup fusion, outgroup relations, their interaction, and the religious similarity score.[2] Our models are defined as follows:

$$y_i \sim \text{Binomial}(30, p_i)$$
$$\text{Model 1:logit}(p_i) = \alpha_{S(i)} + \beta_{S(i)} g_i$$
$$\text{Model 2:logit}(p_i) = \alpha_{S(i)} + \beta_{S(i)} o_i$$
$$\text{Model 3:logit}(p_i) = \alpha_{S(i)} + \beta_{S(i)} g_i + \gamma_{S(i)} o_i + \psi_{S(i)} g_i o_i$$
$$\text{Model 4:logit}(p_i) = \alpha_{S(i)} + \beta_{S(i)} g_i + \gamma_{S(i)} o_i + \psi_{S(i)} g_i o_i + \delta_{S(i)} r_i$$
$$\begin{bmatrix} \alpha_s \\ \beta_s \\ \gamma_s \\ \psi_s \\ \delta_s \end{bmatrix} \sim \text{Multivariate Normal}(\mu, \mathbf{SRS})$$
$$\mathbf{S} = \begin{bmatrix} \sigma_\alpha & 0 & 0 & 0 & 0 \\ 0 & \sigma_\beta & 0 & 0 & 0 \\ 0 & 0 & \sigma_\gamma & 0 & 0 \\ 0 & 0 & 0 & \sigma_\psi & 0 \\ 0 & 0 & 0 & 0 & \sigma_\delta \end{bmatrix}$$
$$\sigma_p \sim \text{Cauchy}(0, 2)$$
$$\mu_p \sim \text{Normal}(0, 1)$$
$$\mathbf{R} \sim \text{LKJCorr}(4)$$

We model the coin allocations y_i out of 30 using a binomial logistic regression with a logit link (note that the formal model includes all priors and diagonal matrix for Model 4 parameters for the sake of illustrating the full model). The variables are as follows: g_i denotes individuals' ingroup fusion score, o_i is their outgroup score, $g_i o_i$ represents the interaction between the two, and r_i is the religious similarity score.

The subscripts i and s denote individual and field site respectively and $S(i)$ is a function returning the site index of individual i. Each field site gets its own intercept, α_s, and slope for ingroup and outgroup relations (β_s and γ_s, respectively), their interaction, ψ_s, and/or religious similarity, δ_s. These parameters are assigned a prior distribution defined by their respective mean vector μ and covariance matrix **SRS**. **S** is a diagonal matrix of each parameter's standard deviation, σ_p, and **R** is the correlation matrix. **R** is assigned a weakly regularizing prior from the LKJCorr family (Lewandowski, Kurowicka, & Joe, 2009) where $\eta = 4$. These models are implemented using non-centered parameterization. As scales' values were ordered categorical, we modelled their effects monotonically using the brms package (Bürkner, 2017) for R. Across the specifications reported here, the model sampled quite well (all $\widehat{R} = 1.00$ and all effective sample sizes were quite large).

[2] Note that the Hadza did not answer questions about religious similarity. They are therefore dropped from Model 4.

4. Results

Fig. 2 illustrates the results across four model specifications (see supplemental for results tables, plots, and further analyses). Across all models, the main intercept's credibility interval is entirely <0. We can therefore confidently state that on average, individuals favored their own cups. There is also some notable cross-cultural variation. For example, Tyvan, Coastal Tannese, and Lovu participants tended to sacrifice more coins while the Hadza and Yasawan-Fijians tended to favor themselves.

Ingroup fusion predicted sacrifice; the bulk of the probability mass (see supplements for illustrations) of fusion's estimated effect on sacrifice is above zero, $\beta_{S(i)} = 0.09$, 95% CI = [−0.07, 0.25]. Holding all predictors constant, the ingroup fusion model (Model 1) estimates a 45% (CI = [40–49%]) chance of sacrificing a coin (i.e., the logistic transform of the main intercept and the 95% credibility intervals). It shows that extreme ingroup fusion—a value of 5—increases the chances of sacrificing a coin to 56%. Note, too, the cross-cultural variation; being from Mauritius shows that higher values of ingroup fusion predict *more* self-favoritism while the direction of the effect is reversed for Brazilians.

As shown in Model 2, the outgroup relations measure also predicted sacrificing more money to distant ingroup members. This model predicts an 8% increase in the probability of an individual sacrificing a coin when outgroup relations scores are at their maximum. Moreover, this measure had different effects across sites. This implies that values of the outgroup relations scale took on different meanings. Among the Coastal Tannese and Hadza samples, for example, higher outgroup scores predicted more withholding while the Mauritians and Brazilian samples were more likely to sacrifice coins to distant ingroup members when outgroup scores were higher.

Model 3 includes individual (denoted by "Ingroup∗Outgroup" in the figure) and site-specific (denoted by "g∗o") effects of the ingroup-outgroup interaction. Holding all predictors constant, the probability of sacrificing a coin is 44%, CI = [40–49%]. The interaction has virtually no association with sacrifice at the individual level. Site-specific estimates of the interaction varied slightly, but overall, individuals in any context are no more likely to sacrifice coins because of the interaction between ingroup and outgroup relations. Model 4 adds the predictor for perceived religious similarity to distant players. Holding all other factors constant, the model predicts that religious similarity of distant recipients increases the predicted sacrifice probability by an additional 2% per scale unit.

5. Discussion

We report evidence that ingroup fusion can help account for actual behaviors with cost-benefit consequences subtler than extreme self-sacrifice (Swann et al., 2010a; Whitehouse, 2018). Importantly, we also show that the magnitude of the effect of an individual's relations with various groups varies cross-culturally.

While ingroup fusion predicted sacrifice, the effect was not large. Similarly, perceived religious similarity of recipients and outgroup relations showed positive-but-slight associations with sacrifice. These mild associations might be due in part to the fact that game rules anchor the experiment's outcome around a binomial distribution; the signal from fusion might be clearer using another game that is free from such constraints (e.g., the dictator game). We also found a similar effect for outgroup relations. This raises the possibility that this often-used pictorial fusion scale measures general prosociality rather than fusion *per se*. Given how robust its association with sacrifice is across contexts and studies, coupled with the fact that the same measure for outgroups predicted sacrifice for distant ingroups, it serves as an important reminder that multiple methods and attention to contextual details of intergroup relations is necessary to rule out what exactly this measure assesses.

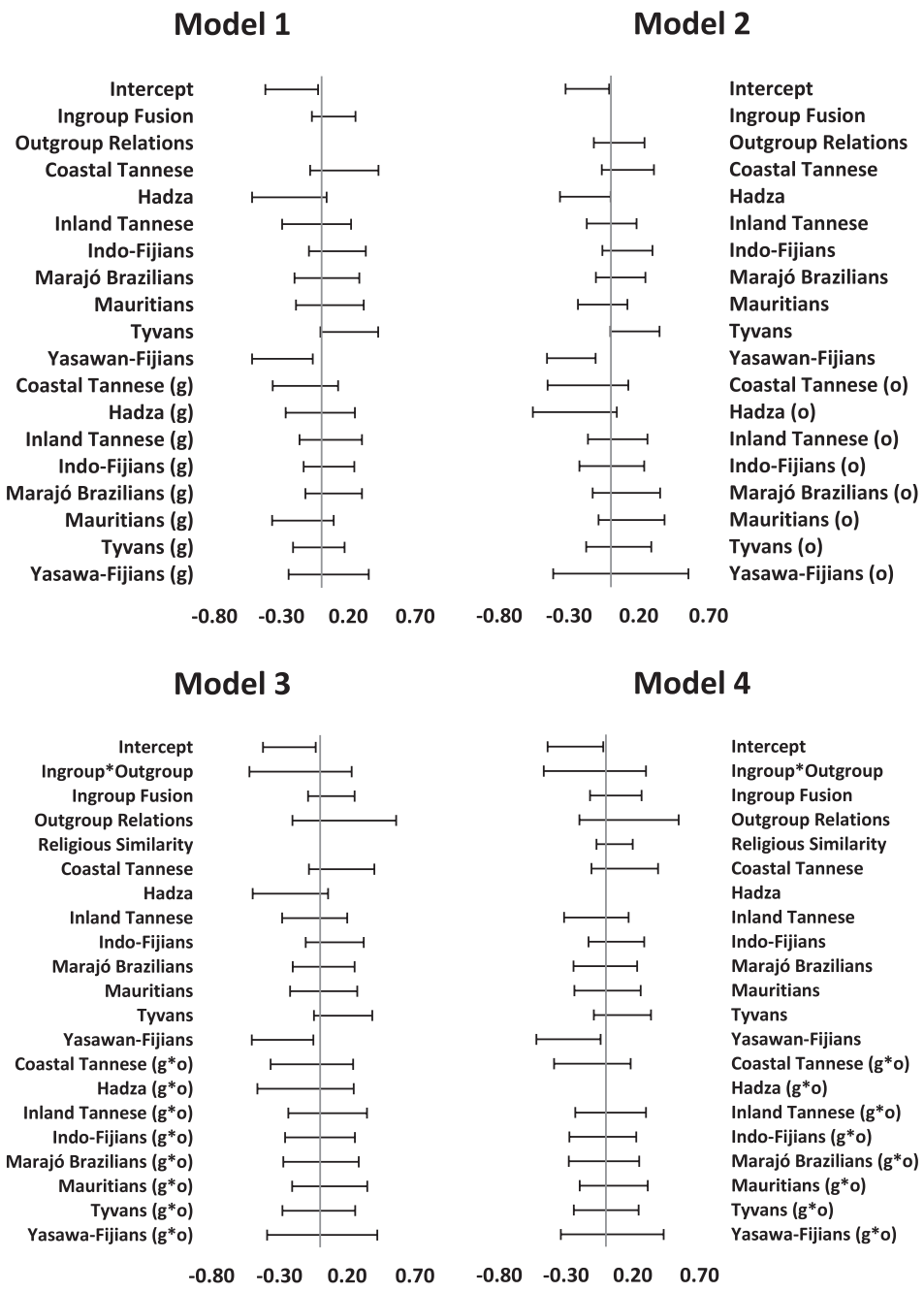

Fig. 2. Model estimates of coin allocation and 95% credibility intervals. Gray line is at 0.0, the threshold of no effect. Estimates > 0.0 indicate sacrificing coins through fairer play, while estimates < 0.0 indicate self-interested bias. Site names are intercepts with varied effects for ingroup (g) and outgroup relations (o) as well as their interaction (g∗o). Model numbers correspond to definitions.

We found no support for the recently proposed (Whitehouse, 2018) interaction of ingroup and outgroup relations on sacrifice (see supplementary Section 3.4.2 for an assessment of the extreme cases), thus failing to find evidence that is qualitatively consistent with earlier tests (Fredman et al., 2017). This is likely due to the outgroup measure; we did not directly ask about negative attitudes towards outgroups. Furthermore, a signal of the effect may have been clearer in a similar experiment where participants can directly benefit their local group–rather than distant ingroup members–at a cost to themselves. Tyvans played one such game with a self-local community dyad (see supplements) but the interaction had no obvious effect. However, they did show a greater likelihood of giving coins to themselves as fusion increased. Yet, given that they largely played by the rules and the cross-cultural variation we reported above, it remains unlikely that this effect would be consistent across contexts.

It is also possible that the selected outgroup relations across the entire sample lacked sufficient variability–or too much in the meaning of low scores of outgroup relations–to detect an interaction effect. First, recall that there was considerable variation in outgroup ratings across sites. As our modelling structure allows such effects to vary across sites, by implication, cross-cultural differences in the meaning of outgroup relationships are partially accounted for. Indeed, we found that the effect of the outgroup relations measure varied across sites; cross-culturally, ratings of outgroup relations were differentially associated with gameplay. If, for example, individuals in two different field sites had very low ratings for outgroups and these low ratings indicate hostility for one site and no relationship for another, the model allows by-site increases in these values to have differential effects on outcome within those sites. In other words, the model allows that high outgroup

relation scores with an enemy to have differential effects than the same scores in contexts where the outgroup poses no threat.

Curiously, in the case of the Hadza who have a long-standing territorial feud with the Datoga and a history of sporadic lethal conflict (Marlowe, 2010), *higher* outgroup relations scores predicted keeping coins, not sacrificing them. It is possible that because the Datoga and their herds are encroaching on Hadza territory, the overlapping circles may have been interpreted as negative–i.e., a metaphor for Hadza being incorporated into Datoga lifeways and territory rather than emotional proximity. In other words, the closer Hadza think the Datoga are, the more inclined they are to keep money from geographically distant Hadza. If so, the fusion measure might be too reliant on a spatial metaphor that is neither universal nor indicative of the same social phenomena for a similarly diverse sample. In addition to having the prerequisite knowledge of participants' lifeways, having a better sense of how participants interpret the scale would rule out such possibilities.

Further research with more diverse intergroup relations, nuanced, and more direct measures for outgroup relations would nevertheless provide more confidence in inference-making, particularly with respect to how much "fusion"–above and beyond general sociability–contributes to sacrificial behaviors across the cost spectrum and societies.

Ethical statement

This project was originally approved by the University of British Columbia's Behavioural Research Ethics Board (#H13-00671) and subsequently approved by the ethical review boards at the home university of each researcher who collected the data.

Author contributions

B.G.P. initiated and managed this project, wrote the bulk of the main text, conducted the main analyses, and contributed to the supplementary materials. M.L. contributed to writing the main text and wrote the bulk of the supplementary materials.

Declaration of conflicting interests

The authors declare that they have no conflicts of interest with respect to the authorship or publication of this article.

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Open practices

We used the publicly available Evolution of Religion and Morality Project data set (Purzycki et al., 2016a Version 5.0). All data and analytical scripts for use in R are available at http://github.com/bgpurzycki/fusion.

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Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.cognition.2019.01.015.

References

Apicella, C. L. (2018). High levels of rule-bending in a minimally religious and largely egalitarian forager population. *Religion, Brain and Behavior, 8*(2), 133–148.
Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology, 63*(4), 596–612.
Atkinson, Q. D. (2018). Religion and expanding the cooperative sphere in Kastom and Christian villages on Tanna, Vanuatu. *Religion, Brain and Behavior, 8*(2), 149–167.
Bürkner, P. C. (2017). brms: An R package for Bayesian multilevel models using Stan. *Journal of Statistical Software, 80*(1), 1–28.
Cohen, E., Baimel, A., & Purzycki, B. G. (2018). Religiosity and resource allocation in Marajó, Brazil. *Religion, Brain and Behavior, 8*(2), 168–184.
Fredman, L. A., Bastian, B., & Swann, W. B. (2017). God or country? fusion with judaism predicts desire for retaliation following palestinian stabbing intifada. *Social Psychological and Personality Science, 8*(8), 882–887.
Gómez, Á., Brooks, M. L., Buhrmester, M. D., Vázquez, A., Jetten, J., & Swann, W. B. (2011). On the nature of identity fusion: insights into the construct and a new measure. *Journal of Personality and Social Psychology, 100*(5), 918–933.
Gómez, Á., Lopez-Rodriguez, L., Sheikh, H., Ginges, J., Wilson, L., Waziri, H., ... Atran, S. (2017). The devoted actors will to fight and the spiritual dimension of human conflict. *Nature Human Behaviour, 1*(9), 673–679.
Hruschka, D., Efferson, C., Jiang, T., Falletta-Cowden, A., Sigurdsson, S., McNamara, R., ... Henrich, J. (2014). Impartial institutions, pathogen stress and the expanding social network. *Human Nature, 25*(4), 567–579.
Jiang, T. (2013). Cheating in mind games: The subtlety of rules matters. *Journal of Economic Behavior and Organization, 93*(9), 328–336.
Jiménez, J., G'ømez, Á., Buhrmester, M. D., Vázquez, A., Whitehouse, H., & Swann, W. B. (2016). The dynamic identity fusion index: A new continuous measure of identity fusion for web-based questionnaires. *Social Science Computer Review, 34*(2), 215–228.
Lewandowski, D., Kurowicka, D., & Joe, H. (2009). Generating random correlation matrices based on vines and extended onion method. *Journal of Multivariate Analysis, 100*(9), 1989–2001.
Marlowe, F. (2010). *The Hadza: hunter-gatherers of tanzania.* Berkeley: University of California Press.
McNamara, R. A., & Henrich, J. (2018). Jesus vs. the ancestors: How specific religious beliefs shape prosociality on Yasawa Island, Fiji. *Religion, Brain and Behavior, 8*(2), 185–204.
Purzycki, B. G., Apicella, C., Atkinson, Q. D., Cohen, E., McNamara, R. A., Willard, A. K., ... Henrich, J. (2016a). Cross-cultural dataset for the evolution of religion and morality project. *Scientific Data, 3*, 160099.
Purzycki, B. G., Apicella, C., Atkinson, Q. D., Cohen, E., McNamara, R. A., Willard, A. K., ... Henrich, J. (2016b). Moralistic gods, supernatural punishment and the expansion of human sociality. *Nature, 530*(7590), 327–330.
Purzycki, B. G., & Kulundary, V. (2018). Buddhism, identity, and class: Fairness and favoritism in the Tyva Republic. *Religion, Brain and Behavior, 8*(2), 205–226.
Purzycki, B. G., Norenzayan, A., Apicella, C., Atkinson, Q. D., Cohen, E., Henrich, J., ... Xygalatas, D. (2018). The evolution of religion and morality: A synthesis of ethnographic and experimental evidence from eight societies. *Religion, Brain and Behavior, 8*(2), 101–132.
Schubert, T. W., & Otten, S. (2002). Overlap of self, ingroup, and outgroup: Pictorial measures of self-categorization. *Self and Identity, 1*(4), 353–376.
Segal, K., Jong, J., & Halberstadt, J. (2019). The fusing power of natural disasters: An experimental study. *Self and Identity, 17*(5), 574–586.
Sheikh, H., Gómez, A., & Atran, S. (2012). Empirical evidence for the devoted actor model. *Current Anthropology, 57*(S13), S204–S209.
Swann, W. B., & Buhrmester, M. D. (2015). Identity fusion. *Current Directions in Psychological Science, 24*(1), 52–57.
Swann, W. B., Buhrmester, M. D., Gómez, A., Jetten, J., Bastian, B., Vázquez, A., ... Sharma, S.a. (2014a). What makes a group worth dying for? identity fusion fosters perception of familial ties, promoting self-sacrifice. *Journal of Personality and Social Psychology, 106*(6), 912–926.
Swann, W. B., Gómez, Á., Buhrmester, M. D., López-Rodríguez, L., Jiménez, J., & Vázquez, A. (2014b). Contemplating the ultimate sacrifice: Identity fusion channels pro-group affect, cognition, and moral decision making. *Journal of Personality and Social Psychology, 106*(5), 713–727.
Swann, W. B., Gómez, Á., Dovidio, J., Hart, S., & Jetten, J. (2010a). Dying and killing for one's group: Identity fusion moderates responses to intergroup versions of the trolley problem. *Psychological Science, 21*(8), 1176–1183.
Swann, W. B., Gómez, A., Huici, C., Morales, J., & Hixon, J. G. (2010b). Identity fusion and self-sacrifice: Arousal as a catalyst of pro-group fighting, dying, and helping behavior. *Journal of Personality and Social Psychology, 99*(5), 824–841.
Swann, W. B., Gómez, Á., Seyle, D. C., Morales, J., & Huici, C. (2009). Identity fusion: The interplay of personal and social identities in extreme group behavior. *Journal of Personality and Social Psychology, 96*(5), 995–1011.

Swann, W. B., Jetten, J., Gómez, Á., Whitehouse, H., & Bastian, B. (2012). When group membership gets personal: A theory of identity fusion. *Psychological Review, 119*(3), 441–456.
Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin, & S. Worchel (Eds.). *The social psychology of intergroup relations* (pp. 33–47). Monterey: Brooks Cole.
Whitehouse, H. (2018). Dying for the group: Towards a general theory of extreme self-sacrifice. *Behavioral and Brain Sciences, 41*, 1–62.
Whitehouse, H., Jong, J., Buhrmester, M. D., Gómez, Á., Bastian, B., Kavanagh, C. M., ... Gavrilets, S. (2017). The evolution of extreme cooperation via shared dysphoric experiences. *Scientific Reports, 7*, 44292.
Whitehouse, H., McQuinn, B., Buhrmester, M., & Swann, W. B. (2014). Brothers in arms: Libyan revolutionaries bond like family. *Proceedings of the National Academy of Sciences, 111*(50), 17783–17785.
Willard, A. K. (2018). Religion and prosocial behavior among the Indo-Fijians. *Religion, Brain and Behavior, 8*(2), 227–242.
Xygalatas, D., Kotherová, S., Maňo, P., Kundt, R., Cigán, J., Klocová, E. K., & Lang, M. (2018). Big gods in small places: the random allocation game in mauritius. *Religion, Brain and Behavior, 8*(2), 243–261.