Identity Fusion, Outgroups, and Sacrifice: A Cross-Cultural Test

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Identify fusion theory has become a popular psychological explanation of costly self-sacrifice, with recent work positing that an interaction between negative outgroup relations and fusion with one's ingroup which would lead to sacrificial behavior that benefits the ingroup. We test this hypothesis 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 others. However, the posited negative interaction between ingroup and outgroup relations shows no consistent effects at the individual or population levels because outgroup fusion also predicts sacrificing an opportunity to take more money. We conclude by suggesting that the fusion scale measures generalized sociability and/or is not necessarily able to precisely capture outgroup hostility.

The theory of identity fusion (Swann, et al., 2009; 2010b; 2014) has received a considerable attention for its ability to predict self-expressed willingness to sacrifice for a group. The visceral feeling of oneness blurs the boundaries between individuals, fostering close affinity with each other. In contrast to social identity theory (Tajfel and 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, et al., 2010b; Swann Jr., Jetten, Gómez, Whitehouse, and Brock, 2012). Recently, Whitehouse (in press) 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, et al., 2010a). Fused individuals are more likely to claim they are willing to fight and die for their country (Swann, et al., 2010a; Swann, et al., 2014; Swann Jr.,, 2014; Whitehouse, et al., 2017). Evidence from Iraq (Gómez, et al., 2017) and Libya (Whitehouse, et al., 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.

There are, however, a few shortcomings to this body of work. First, the research typically focuses on extreme rather than subtle forms of sacrifice. As a consequence of focusing on extreme behavior, many of these works (Swann, et al., 2009; 2010a) dichotomize fusion scales in their methods, thus treating fusion and costs of self-sacrifice as trait-like characteristics rather than continuous covariates (cf. Gómez, et al., 2011; Jiminez, Gómez, Buhrmester, Vázquez, Whitehouse, and Swann, 2016; Segal, Jong, and Halberstadt, in press; Swann, et al., 2010b). Another consequence of this focus is that the bulk of the literature considers self-reports of willingness to engage in extreme acts rather than actual behaviors. Furthermore, the postulated effect of the interaction between ingroup fusion and outgroup relations (Whitehouse, in press) on sacrifice remains untested. Finally, this research has largely bypassed sampling from traditional, non-state societies (cf. Swann, et al., 2014).

Here, we test whether the interaction between identity fusion with members of local co-ethnic, co-religious groups on the one hand and outgroup relations on the other facilitates self-sacrificial behavior for the group 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 ingroup fusion interacts with outgroup relations to predict sacrificing coins for one's group. Given that the costs of sacrifice vary, we assess how generalizable the theory is based on its coverage of that variation.

Method

To assess the role fusion plays on sacrifice, we utilize the Evolution of Religion and Morality Project dataset (Purzycki, et al., 2016) that includes data (N = 592) from eight ethnographically unique field sites (table 1) that cover a diverse range of human societies including the foraging Hadza of Tanzania, horticulturalist Tannese from Vanuatu and Fiji, and fully-market integrated samples from Mauritius and Marajó, Brazil.

We measure sacrifice with outcomes in a Random Allocation Game. 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. If aggregate allocations deviate from a binomial distribution, this is indicative of 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. 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.

We measured fusion using the visual fusion scale (Swann, et al., 2009, see supplements for discussion of other fusion measures the literature employs). 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. 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 feuds). We also asked how similar participants thought the distant recipients' religious traditions were (-2 to 2).

Here, we: (a) formalize a theoretically-focused model that (b) allows the proposed ingroup-outgroup fusion 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 the most straightforward model and three additional specifications (see supplemental for more model specifications with other controls and further discussion).

We define our focal model (Panel a in figure 1) below. We model the coin allocations y_i out of 30 using a binomial logistic regression with a logit link:

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

The variables are as follows: g_i denotes individuals' ingroup fusion score, o_i is their outgroup fusion score, and $g_i o_i$ represents the interaction between the two. 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 fusion (β_s and γ_s, respectively) as well as their interaction, ψ_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, and Joe, 2009) where $\eta = 4$. This model is 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 $\hat{R} = 1.00$ and all effective sample sizes were quite large).

Results

Figure 1 illustrates the results across four model specifications (see supplemental for results tables). Across all models, the main intercept's 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.

Panel (a) of the figure illustrates the main model defined above, including individual (denoted by "Ingroup*Outgroup" in the figure) and site-specific (denoted by "g*o") effects of the ingroup-outgroup fusion interaction. Holding all other factors constant, the probability of sacrificing a coin (i.e., the logistic transform of the main intercept)

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, Baimel, and Purzycki (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)

Table 1
Descriptive features of target variables for each field site. *Values for fusion scores 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.*

is 44%, CI = [40-49%]. Contrary to the prediction, 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 fusion. Panel (b) is the same model, but adds an individual-level predictor of 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.

Note that the simple effects for fusion in Panels (a) and (b) are positive. Simpler models tease apart the ingroup-outgroup fusion interaction by including simple and varying effects for ingroup (Panel c) or outgroup (Panel d) relations. These show that while ingroup fusion predicts sacrifice, outgroup fusion does as well. The ingroup fusion model (Panel c) predicts a 45% (CI = [40-49%]) chance of sacrificing a coin, holding all other factors constant. It shows that extreme ingroup fusion (i.e., 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.

We also confirmed that the outgroup measure took on different meanings across sites, as shown in Panel (d). Among the Coastal Tannese and Hadza samples, for example, higher outgroup fusion predicted more withholding while the Mauritians and Brazilian samples were more likely to sacrifice coins when outgroup fusion was higher. This model predicts an 8% increase in the probability of an individual sacrificing a coin when outgroup fusion is maximal.

Discussion

While the literature (Swann, et al., 2010a; Whitehouse, in press) primarily focuses on self-reported likelihood of engaging in extreme acts, we show here that ingroup fusion can help account for actual behaviors with relatively subtler cost-benefit consequences. Importantly, we show that fusion's effects vary cross-culturally.

While ingroup fusion predicted sacrifice, the effect was not large. Similarly, perceived religious similarity of recipients and outgroup fusion 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 found no support for the recently proposed (Whitehouse, in press) interaction of ingroup and outgroup fusion on sacrifice. It may have been clearer in a similar experiment where participants can directly benefit their local group at a cost to themselves. Tyvans played a game with a self-local community dyad (see supplements). The interaction had no obvious effect but they did show a greater likelihood of giving coins to themselves as fusion increased. However, 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 of the main study lacked sufficient variability. Recall, however, that we found cross-cultural variation in the outgroup fusion measure's effects on sacrifice; cross-culturally, ratings of outgroup relations were differentially associated with gameplay. As our modelling structure allows effects to vary across sites, by implication, cross-cultural differences in the meaning of outgroup relationships are accounted for. Further research with more diverse intergroup relations would nevertheless provide more confidence in inference-making.

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Supplemental Material

Supplementary analyses and all materials used here are available at `http://github.com/bgpurzycki/fusion`.

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., 2016, Version 5.0). All data and analytical scripts for use in R are available at `http://github.com/bgpurzycki/fusion`.

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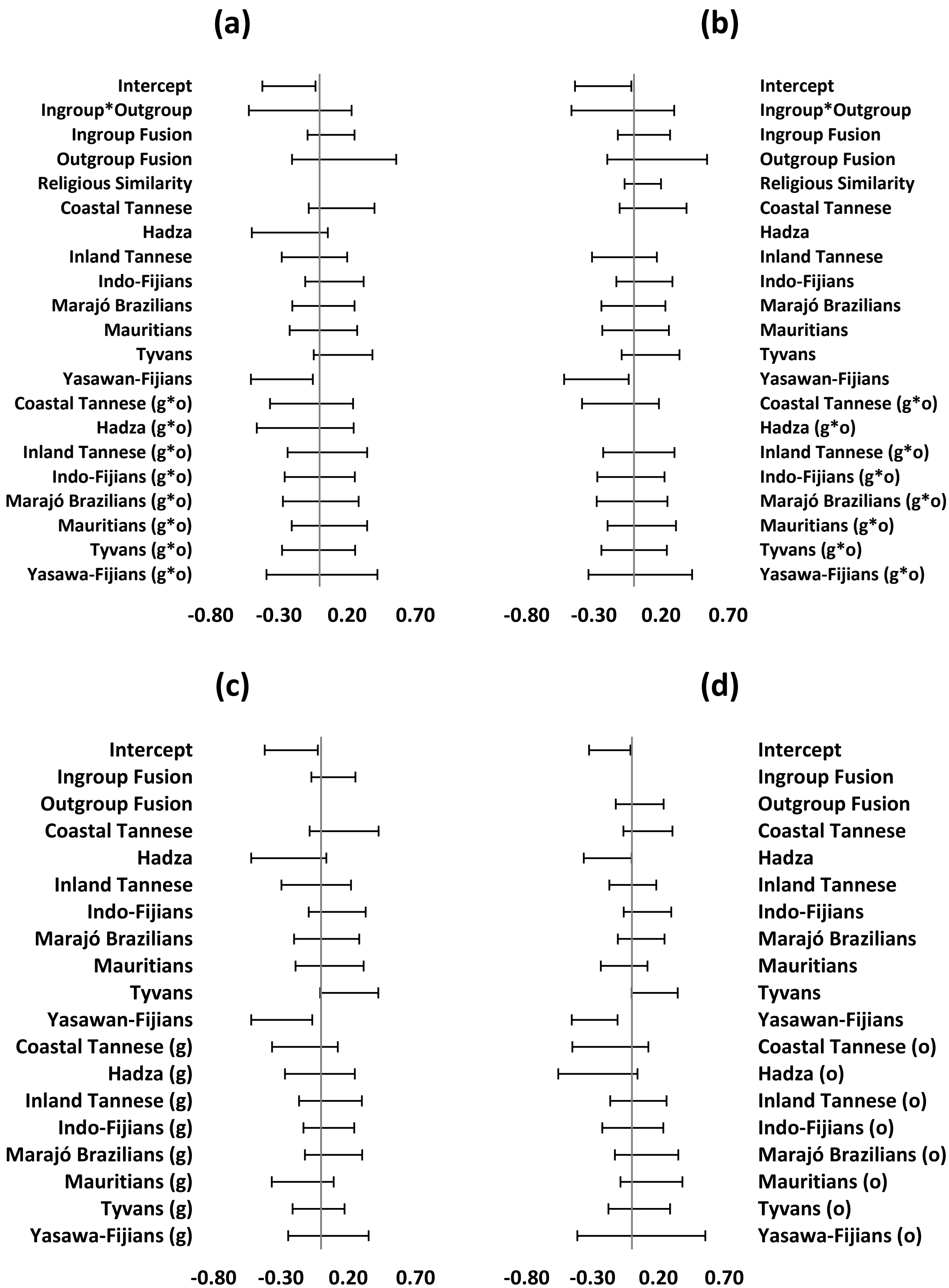

Figure 1. **Model estimates of coin allocation and 95% credibility intervals**. Gray line is at 0.0, the threshold of no effect. Estimates > 0.0 indicate sacrificing coins through fairer play, while estimates < 0.0 indicate self-interested bias. Site names are intercepts with varied effects for ingroup (g) and outgroup fusion (o) as well as their interaction (g*o). Panel (a) reports the main model defined above, (b) adds religious similarity between participants' ingroups and distant co-religionists, but drops the Hadza due to missing data, (c) includes only ingroup fusion, and (d) includes only outgroup relations.