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### When Terror Hits Home: Identity Fused Americans Who Saw Boston Bombing Victims as “Family” Provided Aid

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# When Terror Hits Home: Identity Fused Americans Who Saw Boston Bombing Victims as “Family” Provided Aid

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When tragedy strikes a group, only some group members characteristically rush to the aid of the victims. What motivates the altruism of these exceptional individuals? Here, we provide one set of answers based on data collected before and shortly after the 15 April 2013, Boston Marathon bombings. The results of three studies indicated that Americans who were strongly “fused” with their country were especially inclined to provide various forms of support to the bombing victims. Moreover, the degree to which participants reported perceiving fellow Americans as *psychological kin* statistically mediated links between fusion and pro-group outcomes. Together, these findings shed new light on relationships between personal and group identity, cognitive representations of group members, and personally costly, pro-group actions.

**Keywords:** Identity fusion; Group identity; Pro-group behavior; Psychological kinship.

The 15 April 2013 Boston Marathon bombings sparked an outpouring of support by Americans all over the country. More than 195,000 people donated over \$70 million to victim charities while others provided socio-emotional support (e.g., written letters). The prosocial acts of many Americans in response to the attack prompted a simple but important research question: what motivates members of diverse groups (e.g., nations, religions) to make personal sacrifices, both large and small, for one another? Social psychological perspectives on pro-group action have emphasized the impact of devotion to

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the larger collective (e.g., Tajfel & Turner, 1979), whereas anthropological perspectives have emphasized the impact of devotion to fellow *members* of the collective (e.g., Atran, 2010; Whitehouse, 2004). Here, we use the recently articulated theory of identity fusion (Swann, Jetten, Gómez, Whitehouse, & Bastian, 2012) to bridge these perspectives. Specifically, we propose that Americans who are strongly “fused” with the USA (i.e., those who experience a visceral sense of oneness with group members as well as the larger collective) are especially willing to assist victims. Furthermore, we propose that perceiving other members as family (i.e., psychological kin) underlies relationships between identity fusion and pro-group behavior.

## Identity Fusion

Identity fusion theory proposes that individuals vary in the degree to which they develop a visceral sense of oneness and shared strength with a group (Swann, Gómez, Seyle, & Morales, 2009). For a strongly fused person, one’s personal self (i.e., unique, individuating qualities) aligns extremely closely with one’s social identity (i.e., membership in a group category), such that essential properties of the personal self (e.g., agency) are shared with the group, and one’s social identity is an essential part of the personal self. In contrast, for those not strongly fused to the group, one’s personal identity is weakly aligned with the social identity, and the personal self contributes little to pro-group action (Swann et al., 2012).

To measure the degree to which one feels fused with a group, Swann et al. first developed a single-item scale in which respondents chose which of five pictorial Venn-diagram representations best captured the relationship between their personal self in relation to the group (Swann et al., 2009). Aside from its explicit emphasis on the relationship of the personal and group identity, the measure resembled other measures developed to capture interpersonal closeness (Aron, Aron, & Smollan, 1992), self-categorization (Schubert & Otten, 2002), and in-group identification (Coats, Smith, Claypool, & Banner, 2000; Tropp & Wright, 2001). Shortly after its introduction, researchers developed a seven-item self-report scale (Gómez et al., 2011). Example items include “I am one with my group” and “I make my group strong.” In past studies that compared the predictive validity of the verbal and pictorial scales (e.g., Gómez et al., 2011), the verbal scale consistently explained more variance in outcomes than did the pictorial scale. Thus, the verbal scale was used in the studies reported here.

A growing body of research suggests that fusion is a robust predictor of endorsements of personally costly, pro-group outcomes (for a review, see Swann et al., 2012). People who are strongly fused with their country (e.g., the USA, Spain) are especially willing to endorse physically fighting and dying to protect their country (Gómez et al., 2011; Swann et al., 2009). When presented with intergroup variations of moral dilemmas, only strongly fused persons endorse self-sacrifice to save the lives of ingroup members (Gómez et al., 2011; Swann, Gómez, Dovidio, Hart, & Jetten, 2010). The present studies seek to determine if these findings generalize beyond support to abstractions to specific members one’s group (i.e., the bombing victims). We accordingly included several novel behavioral outcomes in addition to measures of pro-group intentions examined in previous work.

### *Fusion and Relational Ties*

Cognizant of the importance of interpersonal contact and relationships for group behavior (Allport, 1954), Swann et al. (2012) theorized that the development of close relational ties

amongst ingroup members serves as a key mechanism motivating strongly fused persons to enact personally costly, pro-group behaviors (see also, Brewer & Gardner, 1996). The crucial role of relational ties within fusion theory is one key difference from past approaches to understand group identity. For instance, social identity (Tajfel & Turner, 1979) and self-categorization theories (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) posit that when social identities are salient, group members function as mere vessels of prototypic group qualities (e.g., group norms). In so doing, members are tied together by shared links to the group category rather than to each other. A long line of research on “minimal groups” supports this perspective (e.g., Billig & Tajfel, 1973; Turner, Sachdev, & Hogg, 1983). In this paradigm, participants identify with hypothetical groups in which they know no one. By necessity, pro-group sentiments grow from ties to the group category rather than to group members.

In contrast, strongly fused group members may come to see other group members as individuals in their own right rather than mere exemplars of prototypical group qualities (Swann et al., 2012). In fact, due to their feelings of oneness with other group members, fused individuals may come to accord with group members the status of “family” or “psychological kin” (Swann, Buhrmester, et al., 2014). Such perceptions of kinship are potentially important because they are associated with strong feelings of inherent value, protection, obligation, and duty (Bailey, 1988).

To be sure, the development of kinship perceptions amongst strongly fused persons would be unsurprisingly in small, intimate groups (e.g., tribal or military units), for in such groups members have ample opportunity for the development of family-like ties with all group members. More surprising, however, is that strongly fused persons in large collectives (e.g., nation, religion) may come to regard millions of members with whom they are unacquainted as kin. Swann et al. (2012) posited that when people become strongly fused to the group, they *project* feelings of kinship onto the collective that are usually reserved for actual kin. Although the precise mechanism underlying this projection process remains unspecified, its manifestations can be observed in many large groups: fraternity and sorority members often become “brothers and sisters,” religious leaders become “fathers and mothers,” and revolutionaries become “sons and daughters” of the cause (Atran, 2010; Junger, 2010).

Based on the aforementioned analysis, we propose that strongly fused Americans who develop especially high levels of psychological kinship to other Americans will engage in personally costly, pro-group support behaviors. Recent evidence by Swann, Buhrmester, et al. (2014) provides initial support for our hypothesis. Across multiple studies, they found that strongly fused persons who were led to believe that they shared either biological or value-based essences with ingroup members (i.e., key elements of common kin-bonds) were especially willing to report personal willingness to fight and die for their country. In addition, in one study they discovered that the interactive effect of fusion and a shared essence manipulation on endorsements of self-sacrifice for one’s country was mediated by self-reported levels of feeling familial ties with the ingroup (i.e., a moderated mediation effect, see Study 6, Swann, Buhrmester, et al., 2014).

In summary, the current set of studies builds upon past work in several key ways. First, we explored a range of novel pro-group behavioral outcomes (e.g., financial and socio-emotional support) hypothesized to result from fusion and kin-perceptions. Second, in one study we were able to measure outcomes in the immediate wake of the bombings using a sample of participants who had completed the fusion measure *prior* to the bombings, thus providing a unique two-wave design. Finally, inspired by stories of exceptional individuals selflessly helping victims, we devised measures of pro-group behaviors in ways that made a small but positive impact on the lives of the victims

(i.e., by collecting and sending donations and notes of support from participants to aid their recoveries).

## Preliminary Study

To lay the groundwork for the three main studies, we first sought to determine the relationship between the identity fusion scale (Gómez et al., 2011) and a recently developed measure of kin-perceptions by Swann, Buhrmester, et al. (2014). Since the kin-perceptions measure was originally developed in Spanish, we had separate bilingual experts first translate the items to English and back-translate them to Spanish to verify a correct translation. U.S. participants on Mechanical Turk ( $N = 321$ ; 53% female;  $M^{\text{age}} = 29.3$ ) completed the seven-item verbal fusion scale ( $M = 4.77$ ,  $SD = 1.30$ ,  $\alpha = .94$ ; example items include “I am one with my country” and “I make my country strong”) and the three-item kin-perceptions scale ( $M = 4.11$ ,  $SD = 1.53$ ,  $\alpha = .93$ ; items “Members of my country are like family to me,” “If someone in my country is hurt or in danger, it is like a family member is hurt or in danger,” “I see other members of my country as brothers and sisters”) in a counterbalanced order. Responses to both scales ranged from 1 (strongly disagree) to 7 (strongly agree). As expected, the two scales were positively correlated  $r(319) = .60$ ,  $p < .001$ , and scale presentation order did not significantly affect this association. See Table 1 for a summary of identity fusion and kin-perceptions scale characteristics for each study. Also, for reviews of Mechanical Turk’s use in social science research, see Berinsky, Huber, and Lenz (2012) (also, Buhrmester, Kwang, & Gosling, 2011; Horton, Rand, & Zeckhauser, 2011; Mason & Suri, 2012; Paolacci, Chandler, & Ipeirotis, 2010).

To test the assumption that the kin-perceptions items were not mere alternative wordings of the identity fusion construct, we conducted two confirmatory factor analyses to compare model fits for the two-factor solution (fusion vs. kin-perceptions) versus a single-factor solution using AMOS (Arbuckle, 1997). Items were permitted to load only on expected components, and item errors were not permitted to correlate. For the two-

**TABLE 1** Characteristics of Fusion and Kin-Perceptions by Study

	Fusion	Kin-perceptions
<i>Preliminary study</i>		
$\alpha$	.94	.93
$M$ (SD)	4.77 (1.30)	4.11 (1.53)
$r$	.60**	
<i>Study 1</i>		
$\alpha$	.90	.88
$M$ (SD)	4.76 (1.13)	3.97 (1.30)
$r$	.67**	
<i>Study 2</i>		
$\alpha$	.91	.92
$M$ (SD)	4.33 (1.29)	3.99 (1.67)
$r$	.72**	
<i>Study 3</i>		
$\alpha$	.94	.93
$M$ (SD)	4.30 (1.52)	4.16 (1.58)
$r$	.72**	

Note:  $r$  = Pearson’s  $r$  correlation between fusion and kin-perceptions; fusion and kin-perceptions measured on seven-point Likert scales (range 1–7).

\*\* $p < .001$ .

factor model, the residual index fell below the .08 benchmark (root-mean-square error of approximation [RMSEA] = .078), and model fit indices exceeded the .930 benchmark (comparative fit index [CFI] = .976, normed fit index [NFI] = .965, goodness-of-fit index [GFI] = .941). In comparison, the single-factor model metrics did not meet adequate fit benchmarks (CFI = .792, NFI = .783, GFI = .709, RMSEA = .229). Importantly, these results were consistent with the pattern of results found by Swann, Buhrmester, et al. (2014) with Spanish participants, and together suggest that the fusion and kin-perception measures represent overlapping but nonetheless distinct constructs. We accordingly utilized these measures in our research.

## Study 1

Study 1 tested the hypothesis that fusion with the USA—measured before the bombings—would predict reports of recent supportive actions toward victims as well as indirectly measured levels of empathic concern for victims (i.e., empathy coded from participants' writings about their recent thoughts and actions since the bombings). For each outcome, we also sought to test the mediating role of our measure of perceptions of psychological kinship.

### *Method*

#### *Participants*

At Time 1, we recruited 80 Americans via Mechanical Turk for a small fee. Participants completed a survey of their “attitudes about their country” during the week before the bombings. The survey included a measure of fusion with the USA and several other scales unrelated to study purposes. The data collected at Time 1 were obviously not gathered with the intent to study reactions to the bombings since the bombings had not yet occurred. Instead, our intent was to collect data at a later time point on outcome measures relating to endorsements of extreme pro-group behavior used in prior research (e.g., Gómez et al., 2011). When the bombings occurred, we chose to re-focus the study on our participants' levels of engagement in actual supportive actions and empathic concerns aimed at the bombing victims and the communities that were affected more broadly (i.e., the citizens of Boston and the marathon running community).

Two days after the bombings, we invited participants to complete a short follow-up survey using Mechanical Turk's anonymous, internal participant notification system. For participating, they received a small amount of money (i.e., 25 cents, a standard amount for a study short in length). The survey was made available for 48 hours. Forty-seven participants (62% female,  $M^{\text{age}} = 36$  years, 81% Caucasian) completed the follow-up survey. Participants who returned for the Time 2 follow-up did not differ significantly in age, gender, ethnicity, or fusion levels from those who did not return.

#### *Time 1 and 2 Measures*

At Time 1, we measured identity fusion with the USA using the seven-item verbal fusion scale ( $M = 4.76$ ,  $SD = 1.13$ ,  $\alpha = .90$ ).<sup>1</sup> At Time 2, we measured kin-perceptions with the same three-item scale used in the preliminary study ( $M = 3.97$ ,  $SD = 1.30$ ,  $\alpha = .88$ ). Based on news reports after the bombings, we developed a short checklist of victim support behaviors. After completing the kin-perception items, participants indicated whether or not they had engaged in each of the following actions intended to support the victims of the bombing or the associated Boston community or running community: wrote supportive messages online (19% replied “yes”), shared practical information online or



offline with intent to support victims or others affected (21%), prayed for victims or those affected (34%), donated blood or money to aid victims or those affected (9%), consoled other Americans emotionally affected by the bombings (23%), or volunteered time to directly aid victims or others affected (6%). “Yes” responses were summed into a composite “victim support actions” score ( $M = 1.13$ ,  $SD = 1.41$ ,  $\alpha = .67$ ). Later we asked participants to describe their thoughts, feelings, and actions in response to learning about the Boston Marathon bombings. Participants wrote down their responses in a text box. These responses were later coded for levels of empathic concern for those affected by the bombings. Participants were then thanked and debriefed.

### Results and Discussion

To test our hypotheses, we performed regression and bootstrapping analyses packaged within the PROCESS macro for SPSS (Hayes, 2013).

#### Support Actions

To determine whether fusion predicted support actions, we first conducted a simple linear regression. For all regression results, we report unstandardized  $b$ 's. Consistent with our hypothesis, fusion predicted number of support actions,  $b = .60$ , SE of  $b = .16$ , 95% CI of  $b$ : .27, .93,  $t(45) = 3.65$ ,  $p < .001$ ,  $r = .48$  (i.e., the total effect or  $c$  path), indicating that persons strongly fused with the USA were especially likely to report high amounts of support. To test the mediational role of kin-perceptions, we conducted a regression in which fusion predicted kin-perceptions (i.e., the  $a$  path). Fusion predicted kin-perceptions,  $b = .78$ , SE of  $b = .13$ , 95% CI of  $b$ : .52, 1.03,  $t(45) = 6.09$ ,  $p < .001$ ,  $r = .67$ , indicating that strongly fused Americans were especially inclined to perceive fellow Americans as psychological kin. In another regression model with fusion and kin-perceptions entered as predictors of support actions, kin-perceptions predicted support actions,  $b = .65$ , SE of  $b = .17$ , 95% CI of  $b$ : .31, .99,  $t(44) = 3.89$ ,  $p < .001$ , while controlling for fusion. This result indicates that Americans who perceived fellow Americans as kin were especially likely to have supported the victims while controlling for the influence of fusion (i.e., the  $b$  path). In this same regression model, the direct effect of fusion on support actions, while controlling for kin-perceptions, was not statistically significant,  $b = .09$ , SE of  $b = .19$ , 95% CI of  $b$ :  $-.30$ , .48,  $t(44) = 0.47$ ,  $p = .63$ , model  $r = .65$ . The test of mediation (i.e., computing the  $ab$  product term and bootstrapped asymmetric 95% confidence intervals,  $n = 5000$  boots) resulted in a statistically significant indirect effect of fusion on support actions through kin-perceptions,  $b = .50$ , SE = .19, 95% CI: .20, .97. A summary of statistical mediation results for all studies is presented in Table 2.

To explore whether a competing mediation model (i.e., kin-perceptions as predictor, fusion as mediator, and support actions as outcome) would be supported by the data, we conducted a series of regressions patterned after the analyses above. Although both the  $a$  and  $c$  paths reached statistical significance ( $t > 3$ ,  $p < .01$ ), the indirect effect of kin-perceptions through fusion on support actions did not reach statistical significance  $b = .05$ , SE = .14, 95% CI:  $-.22$ , .35. These results suggest that the direction of effects is better understood with fusion as predictor and kin-perceptions as mediator, not vice versa, although of course without experimental evidence we cannot rule out or confirm either model of directionality with certainty.

The statistical significance for bootstrapping analyses refers to the 95% CI's of the indirect effect estimates (Preacher & Hayes, 2004; Shrout & Bolger, 2002), and for  $p$ -values we abide by the conventional  $\alpha$  level cutoff of .05. Also note that we use the terms “predict,” “total effect,” “direct effect,” and “indirect effect” in the parlance of statistical



**TABLE 2** Effects of Fusion on Pro-Victim Outcomes Through Kin-Perceptions Across Studies 1–3

Study	<i>N</i>	Path	<i>b</i> (SE)	95% CI of <i>b</i>
Study 1	47	F–KP (a)	.78 (.13)	.52, 1.03
		(F) KP–SA (b)	.65 (.17)	.31, .99
		F–SA (c)	.60 (.16)	.27, .93
		F–KP–SA (ab)	.50 (.19)	.20, .97
		(KP) F–SA (c')	.09 (.19)	–.30, .48
Study 1	47	F–KP (a)	.78 (.13)	.52, 1.03
		(F) KP–EC (b)	.22 (.09)	.03, .42
		F–EC (c)	.28 (.09)	.11, .46
		F–KP–EC (ab)	.17 (.08)	.02, .37
		(KP) F–EC (c')	.11 (.11)	–.11, .33
Study 2	120	F–KP (a)	.94 (.08)	.77, 1.10
		(F) KP–SS (b)	.43 (.18)	.09, .77
		F–SS (c)	.51 (.16)	.20, .83
		F–KP–SS (ab)	.40 (.18)	.06, .79
		(KP) F–SS (c')	.14 (.22)	–.30, .59
Study 3	133	F–KP (a)	.75 (.06)	.63, .88
		(F) KP–WS (b)	.42 (.18)	.08, .78
		F–WS (c)	.47 (.13)	.22, .73
		F–KP–WS (ab)	.32 (.15)	.05, .65
		(KP) F–WS (c')	.17 (.18)	–.18, .53
Study 3	133	F–KP (a)	.75 (.06)	.63, .88
		(F) KP–D (b)	.59 (.19)	.21, .97
		F–D (c)	.50 (.13)	.24, .76
		F–KP–D (ab)	.45 (.15)	.18, .75
		(KP) F–D (c')	.10 (.19)	–.28, .47

*Note:* F, fusion; KP, kin-perceptions; EC, empathic concern; SA, support actions; SS, self-sacrifice; WS, written support; D, donation. Lowercase letters in parentheses under Path heading correspond to common mediation model designations, and uppercase letters in parentheses correspond to control variables included in model.

mediation analysis and do not suggest that these analyses alone directly support a causal argument (Hayes, 2013). However, these results, interpreted in conjunction with recently conducted, similar experimental studies (Swann, Buhrmester, et al., 2014) as well as existing theory (Swann et al., 2012), do provide triangulated support consistent with a causal argument (Iacobucci, Saldanha, & Deng, 2007).

Upon review of the three kin-perceptions items, it struck us that one item, “If someone in my country is hurt or in danger, it is like a family member is hurt or in danger,” focused on the context of members being hurt in a way that overlapped with the context of the bombing—the focus of our support outcome measure. To address the potential effect of overlapping item-content, we removed the “members being hurt” item from the scale mean computation and re-ran the mediation model. The results of this analysis were very similar to the original analysis with the item included. In fact, the size of the indirect effect of fusion on support actions through kin-perceptions was slightly larger than in the first analysis,  $b = .52$ ,  $SE = .18$ , 95% CI: .23, .97. These results suggest that the kin-perceptions item in question did not unduly influence the mediation results because of superficial shared item content.

### ***Empathic Concern***

Two judges naïve to study purposes independently read participants’ written responses to the prompt asking them to describe their thoughts, feelings, and actions after learning

about the bombings. To code for levels of empathic concerns for those affected by the bombings, judges were instructed to code a response as either “1”: This person indicated little to no sense of empathy or emotional concern for those affected; “2”: This person indicated some sense of empathy or emotional concern for those affected; or “3”: This person indicated a lot of empathy or emotional concern for those affected (see Swann, Gómez, et al., 2014, for similar coding approach for the concept of “emotional engagement with the group”). This coding scheme was agreed upon after judges and the first author read a small sampling of responses and decided that only three levels of concern were discernable. Inter-judge reliability was acceptable,  $r(45) = .72$ ,  $p < .001$ , and empathic concern scores were computed by averaging the two judges’ ratings. The mean empathic concerns score was 2.06 (.73), and empathic concern scores correlated positively with reported support actions  $r(45) = .48$ ,  $p = .001$ . Further in the text, we provide examples of written responses to the prompts from which empathic concern was coded. First, here is an example of a written response coded as “3” by both judges (i.e., the respondent indicated a lot of empathy or emotional concern for those affected):

I was extremely saddened by the aftermath of the bombings and immediately went into prayer for those who lost their lives, for those who were hurt, for those who may have a traumatic experience after the fact and for the families. After the bombing was I immediately started talking to my husband about the situation. We prayed first and foremost then our conversation afterwards was that out of concern for those involved and for those indirectly involved. We shook our heads in awe and talked about how someone could be so evil to want to hurt innocent lives. We continuously watched the media coverage for the better half of the day until we just got tired of watching the news because it was starting to have an impact on our moods. I called my mother, my daughters and my mother-in-law and talked about the situation with them as well and we were all disgusted by the overall situation because the bombing should have never happened. I feel as though innocent lives were lost on that day that should not have been.

In comparison, here is an example text coded as “1” by both judges (i.e., the respondent did not indicate a sense of empathy or emotional concern for those affected):

I was at work when a coworker told me that two bombs had just gone off at the finish line of Boston Marathon and another bomb had been discovered. I’ve worked and slept since the bombing and I’ve neither seen nor read any news about it. All my information has come second-hand from coworkers and family. I have not put a lot of thought into it, to be honest. Earlier today my dad mentioned it because there was a press conference or something like that on TV. We talked briefly about it. My dad said, ‘I can’t believe it.’ And I said, ‘Why is it so hard to believe. These things happen all the time. The world hates America. Even Americans hate America. A lot of terrorism comes from within.’ Of course, I have no idea who is responsible for this act or if anyone has claimed credit for the attack. Morbidly, I am simply not surprised. I think it is a terrible thing to have been done. It is not something that ‘happened,’ like an act of nature. This was a deliberate, evil act perpetrated by a person, or by people. It is sad that my first and only reaction to this was, ‘I am not surprised.’

The differences between these responses are stark. The “high empathic concern” respondent described being deeply affected emotionally by the bombings, triggering prayer for those affected by the bombings. In contrast, the “low empathic concern” respondent described a lack of surprise at the event, did not mention any other emotions, and his or her thoughts tended to focus on generalizations about terrorism.

To examine the total, direct, and indirect effects of fusion on empathic concerns for those affected by the bombings through kin-perceptions, we conducted regression and bootstrapping analyses. First, to determine whether fusion predicted levels of empathic concern, we conducted a simple linear regression. As predicted, fusion was positively associated with empathic concerns, unstandardized  $b = .28$ , SE of  $b = .09$ , 95% CI of  $b$ : .11, .46,  $t(45) = 3.29$ ,  $p = .002$ ,  $r = .44$ . Note that the  $a$  path effect of fusion on kin-

perceptions is the same as the *a* path analysis presented earlier. In a regression model with fusion and kin-perceptions entered as predictors of empathic concern, kin-perceptions predicted empathic concern,  $b = .22$ , SE of  $b = .09$ , 95% CI of  $b$ : .03, .42,  $t(44) = 2.32$ ,  $p = .025$ , while controlling for fusion. This result indicates that Americans who perceived fellow Americans as kin were especially likely to have expressed empathic concerns for those affected by the bombings while controlling for the influence of fusion. In this same regression model, the direct effect of fusion on empathic concerns, while controlling for kin-perceptions, was not statistically significant,  $b = .11$ , SE of  $b = .11$ , 95% CI of  $b$ :  $-.11, .33$ ,  $t(44) = 0.99$ ,  $p = .33$ , model  $r = .53$ . The test of mediation resulted in a statistically significant indirect effect of fusion on empathic concerns through kin-perceptions,  $b = .17$ , SE = .08, 95% CI: .02, .37.

To test whether the data supported a competing mediation model, in a series of regressions we switched the ordering of fusion and kin-perceptions in the models (i.e., fusion as mediator). Although both the *a* and *c* paths reached statistical significance ( $t > 4$ ,  $p < .01$ ), the indirect effect of kin-perceptions through fusion on empathic concerns did not reach statistical significance  $b = .06$ , SE = .06, 95% CI:  $-.04, .21$ .

Overall, the results of Study 1 supported the hypothesis that strongly fused Americans are especially likely to perceive other Americans as “family.” In turn, these kin-perceptions were associated with attempts to provide support to victims and voiced empathic concerns for the victims. These findings are the first to reveal links between fusion, kin-perceptions, and recounted pro-group behaviors. Given the attrition rate for the study was quite high, resulting in a lower than expected *N*, we sought to replicate our findings with conceptually similar outcome measures in a larger sample.

## Study 2

Study 2 aimed to extend the findings of Study 1 by testing whether strongly fused persons would go so far as to endorse giving up their own lives to ensure the capture of the responsible terrorists. To evaluate this possibility, we presented participants with hypothetical scenarios. We also sought to test an alternative explanation for our pattern of results. Specifically, we thought that it was plausible that relationships between fusion, kin-perceptions, and to the outcome might be explained by simply knowing a person directly or indirectly affected by the bombings. Knowing someone affected may trigger a willingness to go to extreme lengths to right the wrong committed and may happen to co-vary with fusion, kin-perceptions, or both.

### *Method*

#### *Participants*

The data from Study 2 were collected 1–3 days after the Boston marathon bombings. A total of 120 Americans (54% female,  $M^{\text{age}} = 37.3$ , 60% Caucasian) participated on Mechanical Turk.

#### *Measures*

Participants agreed to complete a survey of their “attitudes about their country,” then completed the verbal fusion scale ( $M = 4.33$ ,  $SD = 1.29$ ,  $\alpha = .91$ ) and kin-perceptions scale ( $M = 3.99$ ,  $SD = 1.67$ ,  $\alpha = .92$ ) in a counterbalanced order. We also included a question to assess whether participants personally knew a victim of the bombings, a Bostonian present in the city that day, or a Boston Marathon participant who was not a victim but present that day (40% replied they knew someone who fit one of these

categories). Lastly, we chose not to include the support actions scale developed for Study 1 because we were concerned that reflecting on such actions might increase socially desirable responding to the hypothetical scenario (or vice versa).

Participants then read a hypothetical moral dilemma crafted for the purposes of this study. The dilemma is conceptually related to intergroup variations on the “trolley dilemma” by Swann, Gómez, Dovidio, et al. (2010) in that it pits the choice of certain death to save imperiled ingroup members versus the choice to live but having allowed other group members to perish, or in our scenario’s case, to allow the bombing perpetrators to escape justice. Note that when these data were collected, authorities had not yet identified the two men responsible, so the scenario at the time was plausible to nearly all participants. Two participants questioned the scenario’s plausibility when given the opportunity to comment about the study during the debriefing. Excluding their data from analyses did not significantly affect the pattern of results, and thus their data were not excluded. The scenario read as follow:

Imagine the authorities have identified 5 foreign terrorists responsible for the Boston Marathon bombings. The terrorists are about to escape on a hijacked jet and have taken you (and only you) hostage. As the plane begins to take off, you have an opportunity to open the emergency door, making it impossible for the bombers to escape. However, if you do this, you will certainly be killed by the bombers. Would you sacrifice your life then and there knowing that the bombers would be certainly caught? Or would you not sacrifice your life, allow the bombers to escape, and leave your fate unknown?

After reading the dilemma, participants indicated whether they would rather (a) sacrifice their lives to ensure the terrorists’ capture or (b) not sacrifice their lives and allow the terrorists to escape (61% chose self-sacrifice, coded as “1,” and 39% chose not to sacrifice themselves, coded as “0” in analyses below). Finally, participants completed demographic information and were then thanked and debriefed.

### *Results and Discussion*

Since the outcome variable was dichotomous, we used logistic regression as well as the bootstrapping techniques employed in Study 1. To determine whether fusion predicted willingness to self-sacrifice, we first conducted a logistic regression. Consistent with our hypothesis, fusion predicted self-sacrifice,  $b = .51$ , SE of  $b = .16$ , Wald  $\chi^2(1) = 10.09$ ,  $p = .001$ , OR = 1.67, 95% CI of OR: 1.22, 2.23. The predicted probability for weakly fused persons ( $-1SD$  from fusion mean) to endorse self-sacrifice was 45%. In contrast, the predicted probability for strongly fused persons ( $+1SD$ ) to endorse self-sacrifice was 76%. To test the mediational role of kin-perceptions, we conducted a linear regression in which fusion predicted kin-perceptions. Fusion did predict kin-perceptions,  $b = .94$ , SE of  $b = .08$ , 95% CI of  $b$ : .77, 1.10,  $t(118) = 11.31$ ,  $p < .001$ ,  $r = .72$ , indicating that strongly fused Americans were especially inclined to perceive fellow Americans as psychological kin. In another regression model with fusion and kin-perceptions entered as predictors of self-sacrifice, kin-perceptions predicted self-sacrifice,  $b = .43$ , SE of  $b = .18$ , Wald  $\chi^2(1) = 6.01$ ,  $p = .01$ , OR = 1.54, 95% CI of OR: 1.09, 2.17, while controlling for fusion. This result indicates that Americans who perceived fellow Americans as kin were especially likely to endorse self-sacrifice in the scenario while controlling for the influence of fusion. In this same regression model, the direct effect of fusion on self-sacrifice, while controlling for kin-perceptions, was not statistically significant,  $b = .14$ , SE of  $b = .22$ , Wald  $\chi^2(1) = .40$ ,  $p = .53$ , OR = 1.15, 95% CI of OR: 0.74, 1.78. The test of mediation resulted in a statistically significant indirect effect of fusion on self-sacrifice through kin-perceptions,  $b = .50$ , SE = .19, 95% CI: .20, .97.

In further analyses, we examined whether the order participants completed the fusion and kin-perceptions scales affected relationships between study variables. No significant effects were found (null results were also found in parallel analyses of Study 3). As in Study 1, we also explored whether the data supported a competing mediation model with kin-perceptions as predictor, fusion as mediator, and self-sacrifice as outcome. Although the *a* and *c* paths reached statistical significance (Wald  $\chi^2$  and  $t > 11$ ,  $p < .01$ ), the indirect effect of kin-perceptions through fusion on self-sacrifice did not reach statistical significance  $b = .08$ ,  $SE = .14$ , 95% CI:  $-.19, .37$ .

To test the alternative hypothesis that the mediational pattern might be explained by simply knowing a person directly or indirectly affected by the bombings, we first explored zero-order relationships between our single “knowing someone” item and other study variables. Inconsistent with the alternative hypothesis, the knowing item was not associated with fusion,  $r(118) = .07$ ,  $p = .47$ , kin-perceptions,  $r(118) = .04$ ,  $p = .74$ , or self-sacrifice,  $\chi^2(1) = .01$ ,  $p = .94$ . Controlling for the knowing item in the full mediation analyses presented earlier did not qualify the pattern of effects.

Overall, the results of Study 2 built upon Study 1 by showing that strongly fused Americans’ perceptions of other Americans as psychological kin buttressed their endorsement of sacrificing their lives to ensure the captures of the responsible terrorists. These results suggest that strongly fused Americans are especially motivated to secure justice for victims and future safety for other group members. More generally, these results support past evidence that fusion is an especially strong predictor of extreme pro-group behavioral intentions (Swann, Gómez, Dovidio, et al., 2010). In Study 3, we sought to provide broader evidence that fusion predicts actions that directly support the victims.

### Study 3

The inspiration for this study came from news reports of numerous Americans who supported victims of the bombings in two ways—by writing personal messages of support to the victims and donating personal funds to the One Fund Boston, a victim relief charity. To capture these two forms of popular support empirically and to relate them to fusion and kin-perceptions, we crafted behavioral outcome measures that could be completed in an online setting.

#### *Method*

##### *Participants*

In total, 133 Americans (58% female,  $M^{\text{age}} = 34$ , 74% Caucasian) completed the survey on Mechanical Turk 5–6 days after the bombings. The survey was posted online for 48 hours. By this time, one suspect had been killed and the other was in custody.

##### *Measures*

The design of the survey was similar to Studies 1 and 2. Participants first completed the fusion scale ( $M = 4.30$ ,  $SD = 1.52$ ,  $\alpha = .94$ ) and the kin-perceptions scale ( $M = 4.16$ ,  $SD = 1.58$ ,  $\alpha = .93$ ) in a counterbalanced order. They then read a short, two-paragraph news report about one of the victims of the bombings. The news report described the victim’s injuries, medical treatment, and future outlook. Participants then learned that they could send the victim a personal note of support or well-wishes. Notes would be mailed to the victim’s workplace (which the first author did). Participants chose to (a) write a note of support to the victim or (b) not write a note (54% wrote a note, coded as “1”; no note written as “0”). An example note read,

Even though you do not feel like it, you are a hero in this country. Even though you were injured seriously, you still wanted to help. You have my respect and admiration. Your strength will help you in the coming days and months. God bless and I hope you a speedy recovery. Thank you.

Many notes written reflected similar heartfelt sentiments and ranged from just a few words to a full paragraph.

After completing demographic information, participants learned that they each would receive a small bonus payment for their participation. They further learned that the researchers associated with the study were collecting contributions for the One Fund Boston. After reading a short description of the fund, participants chose to (a) donate their bonus payment to the fund or (b) keep it (51% donated; donation coded as "1," no donation as "0"). After the study, the first author donated all funds collected to One Fund Boston.

### *Results and Discussion*

We employed the same analytic strategy of Study 2.

#### *Written Notes of Support*

To determine whether fusion predicted written support, we conducted a logistic regression. As hypothesized, fusion predicted written support,  $b = .47$ , SE of  $b = .13$ , Wald  $\chi^2(1) = 12.99$ ,  $p < .001$ , OR = 1.60, 95% CI of OR: 1.24, 2.07. The predicted probability for weakly fused persons ( $-1SD$ ) to write a note of support was 37%. In contrast, the predicted probability for strongly fused persons ( $+1SD$ ) to write a note of support was 71%. To test the mediational role of kin-perceptions, we conducted a linear regression in which fusion predicted kin-perceptions. Fusion predicted kin-perceptions,  $b = .75$ , SE of  $b = .06$ , 95% CI of  $b$ : .63, .88,  $t(131) = 12.09$ ,  $p < .001$ ,  $r = .72$ , indicating that strongly fused Americans were especially inclined to perceive fellow Americans as psychological kin. In another regression model with fusion and kin-perceptions entered as predictors of written support, kin-perceptions predicted self-sacrifice,  $b = .42$ , SE of  $b = .18$ , Wald  $\chi^2(1) = 5.78$ ,  $p = .016$ , OR = 1.53, 95% CI of OR: 1.08, 2.17, while controlling for fusion. This result indicates that Americans who perceived fellow Americans as kin were especially likely to write a supportive note to the victim while controlling for the influence of fusion. In this same regression model, the direct effect of fusion on written support, while controlling for kin-perceptions, was not statistically significant,  $b = .17$ , SE of  $b = .18$ , Wald  $\chi^2(1) = .93$ ,  $p = .34$ , OR = 1.19, 95% CI of OR: 0.84, 1.69. The test of mediation resulted in a statistically significant indirect effect of fusion on written support through kin-perceptions,  $b = .32$ , SE = .15, 95% CI: .05, .65.

As in Studies 1 and 2, we also explored whether the data supported a competing mediation model with kin-perceptions as predictor, fusion as mediator, and written support as outcome. Although the  $a$  and  $c$  paths reached statistical significance (Wald  $\chi^2$  and  $t > 12$ ,  $p < .01$ ), the indirect effect of kin-perceptions through fusion on written support did not reach statistical significance  $b = .12$ , SE = .14, 95% CI:  $-.15$ , .42.

#### *Donations*

To determine whether fusion predicted donation to the victim charity, we conducted a logistic regression. Fusion predicted donation decision,  $b = .50$ , SE of  $b = .13$ , Wald  $\chi^2(1) = 14.11$ ,  $p < .001$ , OR = 1.65, 95% CI of OR: 1.27, 2.14. The predicted probability for weakly fused persons ( $-1SD$ ) to donate was 33%. In contrast, the predicted



probability for strongly fused persons (+1SD) to donate was 69%. In another regression model with fusion and kin-perceptions entered as predictors of donations, kin-perceptions predicted donations,  $b = .59$ , SE of  $b = .19$ , Wald  $\chi^2(1) = 9.30$ ,  $p = .002$ , OR = 1.81, 95% CI of OR: 1.24, 2.64, while controlling for fusion. This result indicates that Americans who perceived fellow Americans as kin were especially likely to donate to victims while controlling for the influence of fusion. In this same regression model, the direct effect of fusion on donations, while controlling for kin-perceptions, was not statistically significant,  $b = .10$ , SE of  $b = .19$ , Wald  $\chi^2(1) = .26$ ,  $p = .61$ , OR = 1.10, 95% CI of OR: 0.76, 1.60. The test of mediation resulted in a statistically significant indirect effect of fusion on donations through kin-perceptions,  $b = .45$ , SE = .15, 95% CI: .18, .75. Moreover, decisions to donate were significantly related to acts of note-writing,  $\chi^2(1) = 22.08$ ,  $p < .001$ .

Lastly, we once again explored whether the data supported a competing mediation model with kin-perceptions as predictor, fusion as mediator, and donation decision as outcome. Although the  $a$  and  $c$  paths reached statistical significance (Wald  $\chi^2$  and  $t > 12$ ,  $p < .01$ ), the indirect effect of kin-perceptions through fusion on donation decision did not reach statistical significance  $b = .07$ , SE = .13, 95% CI:  $-.18$ , .34.

## General Discussion

In the immediate wake of a tragedy such as the 2013 Boston Marathon bombings, which group members are most likely to suspend everyday routines and help fellow members in need? Across three studies, we found broad support for one answer: identity-fused persons. Those who were strongly fused with the USA (measured the week before the bombing) were especially likely to report that they had already supported victims through one or more means in the days immediately following the bombing (Study 1). Additionally, in written reports of their thoughts, feelings, and actions in the days following the bombings, strongly fused persons were especially likely to voice empathic concerns about the victims (Study 1). Moreover, strongly fused persons reported a willingness to go to extreme lengths to support victims, endorsing self-sacrifice over survival to ensure the capture of the terrorists responsible for the bombings (Study 2). In a final study, strongly fused persons were particularly likely to write supportive notes and donate funds to victims (Study 3).

In all studies, we sought to explore the significance of a novel mediator—perceptions of other Americans as kin—derived from the theories of identity fusion (Swann et al., 2012) and psychological kinship (Ackerman, Kenrick, & Schaller, 2007; Bailey, 1988; Whitehouse & Lanman, 2014). Consistent with expectations, strongly fused persons tended to perceive other group members in kin-like terms. In turn, kin-perceptions statistically mediated the effect of fusion on each victim-support outcome.

Past work on fusion diminishes the plausibility of several alternative explanations of our findings. First, fusion is weakly or unassociated with contextual individual difference traits associated with prosociality (e.g., empathy, self-efficacy), and controlling for these variables does not account for fusion's relationship with pro-group outcomes (Gómez et al., 2011). Second, although the outcome measures were tailored to the Boston bombings in our studies, it is unlikely that our findings hinged on the specific circumstances of the bombings. Past studies show that fusion predicts similar kinds of pro-group outcomes in other contextualized and de-contextualized scenarios (e.g., Swann, Gómez, Huici, Morales, & Hixon, 2010). Our focus on the bombings simply provided a real-world context to study pro-group behaviors. Finally, previous work indicates that the prosocial behavior of fused persons is largely limited to the ingroup (Gómez, Morales,



Hart, Vázquez, & Swann, 2011; Swann, Gómez, Huici, et al., 2010). For instance, in one study weakly and strongly fused Spaniards alike were unwilling to endorse self-sacrifice to save Americans (Gómez, Morales, et al., 2011).

Overall, our findings represent an important step forward in understanding the antecedents of personally costly actions that benefit one's ingroup, i.e., parochial altruism. Evolutionary theories of inclusive fitness offer accounts of why individuals lay down their lives for others with whom they share genes (Dawkins, 1976; Hamilton, 1964a, 1964b). Less well understood, however, are mechanisms underlying various forms of altruism for large, diffuse groups such as nations and political parties (cf. Ginges & Atran, 2009). In these groups, members cannot possibly develop actual relationships with *all* group members. Across our studies, we found support for a novel pathway to costly altruism for large, anonymous groups. When a person fuses with a group, it encourages the development of perceptions of other members as family, motivating altruistic behavior toward them. In what follow, we outline the cognitive mechanisms we suspect may be responsible for this connection.

### *Fusion and Psychological Kinship*

Given the consistent links found between fusion and kin-perceptions in our studies, further work is needed to better understand the processes that encourage strongly fused persons to develop kin-perceptions of fellow group members. Some clues may lie in the distal origins of kin detection. Perceptions of group members as psychological kin are thought to stem from functional but fallible kin-detection mechanisms which evolved to help organisms recognize close genetic kin so that they could provide them with resources (Park, Schaller, & Van Vugt, 2008; Penn & Frommen, 2010). Researchers have documented two distinct processes of kin detection: (1) familiarity-based cues, such as imprinting among goslings and warblers (Komdeur, Richardson, & Burke, 2004) and early co-residence among humans (Kushnick & Fessler, 2011; Lieberman & Lobel, 2011) and (2) phenotypic matching, which occurs when individuals assess the similarity of phenotypic features of others to a self or kin prototype. Studies show that perceptions of facial similarity among humans regulate both altruism and sexual attraction (DeBruine, 2004, 2005), and perceptions of shared mental representations (e.g., attitudes) trigger kin-related cognitions and regulate altruistic intent (Park & Schaller, 2005).

We hypothesize that some shared mental representations are more indicative of kinship than others. Perceiving that someone has been socialized to share one's social norms, for instance, may lead to the belief that the person is a member of one's ingroup and a suitable partner for cooperation, but not one's kin (Henrich & Henrich, 2007; Richerson & Boyd, 2005). In contrast, the belief that someone shares essential components of one's autobiographical self-concept provides a compelling foundation for developing psychological kinship (Bruner, 1990; Conway, 2005; Damasio, 2010; McAdams, 2008; Singer & Salovey, 1993). That is, when "what makes me, me" is perceived in another individual, this constitutes a phenotypic cue of kinship, as the sharing of deeply personal memories, experiences, and values served as a fairly reliable marker of genetic relatedness in ancestral populations. Individuals fused with a social identity, we argue, may be especially primed to perceive an essential part of themselves as present in other group members and, consequently, see those group members as kin. We suspect that in the case of the Boston bombings, fused Americans perceived an essential part of their personal selves in the victims, saw those victims as kin, and responded accordingly.

### *Future Directions and Limitations*

Our work may also be viewed through cultural perspectives on self and pro-group behavior. Work by Miller et al. has shown that in independent cultures (e.g., the USA), pro-group action is proportional to one's level of actual kinship (Miller, Bersoff, & Harwood, 1990). In contrast, in interdependent cultures (e.g., India), pro-group action is proportional to feelings of moral obligation to others, not kinship per se. These results suggest that feelings of moral obligation and kinship may not always be intertwined. If so, triggering a sense of obligation to group members, even in the absence of perceptions of psychological kinship, may underlie the fusion's effects on pro-group actions.

More broadly, future work would benefit from examining identity fusion from cultural constructivist perspectives (e.g., Markus & Kitayama, 1991; Yuki, 2003). Many questions are ripe for exploration. For instance, might interdependent cultural systems encourage stronger fusion to vast collectives (e.g., nation, religion) than do independent cultural systems? And if so, what specific cultural institutions and socialization practices result in greater fusion than others?

Researchers would also benefit from studying existing, non-biologically related groups known for high levels of fusion (i.e., where psychological kinship is most likely to develop). For instance, members of the armed services often develop close-knit ties with "brothers-in-arms" (i.e., the men in their small fighting units). Many also extend feelings of localized kinship to superordinate group members (e.g., all military members, or all citizens of one's nation; Marlantes, 2012). But what specific kinds of experiences within or outside one's group contribute to the extension of altruism beyond one's most locally fused group? Exploring such questions will be key for developing a more comprehensive understanding of the relationship between local and extended fusion (Swann et al., 2012).

### *Coda*

In conclusion, identity fusion begins to integrate past psychological perspectives on groups that emphasized strong but relatively impersonal bonds to the group category (e.g., Tajfel & Turner, 1979; Turner et al., 1987) with anthropological perspectives that emphasized relational bonds amongst members in small groups (e.g., Whitehouse, 2004). In bridging the two, we propose that strongly fused persons are especially apt to develop perceptions of fellow group members as psychological kin worthy of sacrifices both small and big. In three studies, we discovered evidence consistent with the hypothesis that for strongly fused Americans, the Boston Marathon bombings were experienced as an attack on their psychological kin, motivating efforts to support the victims and America even to the point of endorsing extreme personal sacrifices.

### **Note**

1. In Studies 1–3, participants also completed Mael and Ashforth's (1992) identification scale and demographics (age, gender, and ethnicity). In preliminary analyses, we conducted regression analyses with age, gender, and ethnicity as simultaneous predictors of each outcome. In no case did these predictors approach the  $p = .05$  level of significance (all  $t$  or  $Wald < 1.8$ ,  $p > .18$ ). Thus, we did not include them in further analyses. In other preliminary analyses, we conducted regressions with identification and fusion as simultaneous predictors of study outcomes. Consistent with previous studies of identity fusion (see Swann et al., 2012), fusion was moderately or strongly related to each of the outcome variables, whereas identification was unrelated to each of the outcome variables.

Additionally, for each study outcome, we conducted mediation analyses including identification as a control variable in models with fusion as predictor and kin-perceptions as mediator. Identification did not qualify the effects of fusion and kin-perceptions in these analyses. Given these results and our theoretical focus on the fusion construct in this article, we have focused our main analyses on fusion for purposes of brevity and clarity. Additional analyses may be obtained from the first author upon request. Lastly, as is common in online data collection settings, a small number of participants in each study (i.e., 12 in the preliminary study, 2 in Time 2 of Study 1, 8 in Study 2, and 10 in Study 3) provided incomplete responses possibly due to loss of Internet connection or deciding to dropout, and were thus dropped from the data-sets prior to analyses. Study *N*'s reported in main text reflect the *N*'s after these incomplete cases were dropped.

## References

- Ackerman, J. M., Kenrick, D. T., & Schaller, M. (2007). Is friendship akin to kinship? *Evolution & Human Behavior*, 28, 365–374. doi:10.1016/j.evolhumbehav.2007.04.004
- Allport, G. W. (1954). *The nature of prejudice*. Cambridge, MA: Addison-Wesley.
- Arbuckle, J. L. (1997). *Amos users guide version 4.0*. Chicago, IL: Smallwaters.
- 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, 596–612.
- Atran, S. (2010). *Talking to the enemy: Violent extremism, sacred values, and what it means to be human*. London: Penguin.
- Bailey, K. G. (1988). Psychological kinship: Implications for the helping professions. *Psychotherapy: Theory, Research, Practice, Training*, 25, 132–141. doi:10.1037/h0085309
- Berinsky, A. J., Huber, G. A., & Lenz, G. S. (2012). Evaluating online labor markets for experimental research: Amazon.com's Mechanical Turk. *Political Analysis*, 20, 351–368.
- Billig, M., & Tajfel, H. (1973). Social categorization and similarity in intergroup behavior. *European Journal of Social Psychology*, 3, 27–52. doi:10.1002/ejsp.2420030103
- Brewer, M. B., & Gardner, W. L. (1996). Who is this “we”? Levels of collective identity and self representations. *Journal of Personality and Social Psychology*, 71, 83–93. doi:10.1037//0022-3514.71.1.83
- Bruner, J. (1990). *Acts of meaning*. Cambridge, MA: Harvard University Press.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6, 3–5. doi:10.1177/1745691610393980
- Coats, S., Smith, E. R., Claypool, H. M., & Banner, M. J. (2000). Overlapping mental representations of self and in-group: Reaction time evidence and its relationship with explicit measures of group identification. *Journal of Experimental Social Psychology*, 36, 304–315.
- Conway, M. A. (2005). Memory and the self. *Journal of Memory and Language*, 53, 594–628.
- Damasio, A. (2010). *Self comes to mind: Constructing the conscious brain*. London: Pantheon.
- Dawkins, R. (1976). *The selfish gene*. Oxford: Oxford University Press.
- DeBruine, L. M. (2004). Facial resemblance increases the attractiveness of same-sex faces more than other-sex faces. *Proceedings of the Royal Society of London, Series B*, 271 (pp. 2085–2090). doi:10.1098/rspb.2004.2824
- DeBruine, L. M. (2005). Trustworthy but not lust-worthy: Context-specific effects of facial resemblance. *Proceedings of the Royal Society of London, Series B*, 272 (pp. 919–922). doi:10.1098/rspb.2004.3003
- Ginges, J., & Atran, S. (2009). What motivates participation in violent political action. *Annals of the New York Academy of Sciences*, 1167, 115–123. doi:10.1111/j.1749-6632.2009.04543.x
- Gómez, Á., Brooks, M., Buhrmester, M., Vázquez, A., Jetten, J., & Swann, Jr., W. B. (2011). On the nature of identity fusion: Insights into the construct and a new measure. *Journal of Personality and Social Psychology*, 100, 918–933. doi:10.1037/a0022642
- Gómez, Á., Morales, J. F., Hart, S., Vázquez, A., & Swann, Jr., W. B. (2011). Rejected and excluded forevermore, but even more devoted: Irrevocable ostracism intensifies loyalty to the group

- among identity-fused persons. *Personality and Social Psychology Bulletin*, 37, 1574–1586. doi:10.1177/0146167211424580
- Hamilton, W. D. (1964a). The genetical evolution of social behavior: I. *Journal of Theoretical Biology*, 7, 1–16. doi:10.1016/0022-5193(64)90038-4
- Hamilton, W. D. (1964b). The genetical evolution of social behavior: II. *Journal of Theoretical Biology*, 7, 17–52. doi:10.1016/0022-5193(64)90039-6
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis*. New York, NY: Guilford Press.
- Henrich, N. S., & Henrich, J. (2007). *Why humans cooperate: A cultural and evolutionary explanation*. Oxford: Oxford University Press.
- Horton, J. J., Rand, D. G., & Zeckhauser, R. J. (2011). The online laboratory: Conducting experiments in a real labor market. *Experimental Economics*, 4, 399–425.
- Iacobucci, D., Saldanha, N., & Deng, X. (2007). A meditation on mediation: Evidence that structural equation models perform better than regression models. *Journal of Consumer Psychology*, 17, 140–154.
- Junger, S. (2010). *War*. New York, NY: Twelve, Hachet Book Group.
- Komdeur, J., Richardson, D., & Burke, T. (2004). Experimental evidence that kin discrimination in the *Seychelles warbler* is based on association and not genetic relatedness. *Proceedings of the Royal Society B: Biological Sciences*, 271, 963–969. doi:10.1098/rspb.2003.2665
- Kushnick, G., & Fessler, D. M. T. (2011). Karo Batak cousin marriage, cosocialization, and the Westermarck hypothesis. *Current Anthropology*, 52, 443–448. doi:10.1086/659337
- Lieberman, D., & Lobel, T. (2011). Kinship on the kibbutz: Coresidence duration predicts altruism, personal sexual aversions, and moral attitudes among communally reared peers. *Evolution and Human Behavior*, 33, 26–34. doi:10.1016/j.evolhumanbehav.2011.05.002
- Mael, F. A., & Ashforth, B. E. (1992). Alumni and their alma mater: A partial test of the reformulated model of organizational identification. *Journal of Organizational Behavior*, 13, 103–123. doi:10.1002/job.4030130202
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224–253.
- Marlantes, K. (2012). *What it is like to go to war*. New York, NY: Atlantic Monthly Press.
- Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior Research Methods*, 44(1), 1–23.
- McAdams, D. P. (2008). Personal narratives and the life story. In O. John, R. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 241–261). New York, NY: Guilford Press.
- Miller, J. G., Bersoff, D. M., & Harwood, R. L. (1990). Perceptions of social responsibilities in India and in the United States: Moral imperatives or personal decisions? *Journal of Personality and Social Psychology*, 58, 33–47.
- Paolacci, G., Chandler, J., & Ipeirotis, P. G. (2010). Running experiments on Amazon Mechanical Turk. *Judgment and Decision Making*, 5, 411–419.
- Park, J. H., & Schaller, M. (2005). Does attitude similarity serve as a heuristic cue for kinship? Evidence of an implicit cognitive association. *Evolution and Human Behavior*, 26, 158–170. doi:10.1016/j.evolhumbehav.2004.08.013
- Park, J. H., Schaller, M., & Van Vugt, M. (2008). Psychology of human kin recognition: Heuristic cues, erroneous inferences, and their implications. *Review of General Psychology*, 12, 215–235. doi:10.1037/1089-2680.12.3.215
- Penn, D. J., & Frommen, J. G. (2010). Kin recognition, an overview of conceptual issues, mechanisms and evolutionary theory. In P. Kappeler (Ed.), *Animal behavior, evolution and mechanisms* (pp. 55–85). Berlin: Springer.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36, 717–731.
- Richerson, P., & Boyd, R. (2005). *Not by genes alone: How culture transformed human evolution*. Chicago, IL: University of Chicago Press.

- Schubert, T., & Otten, S. (2002). Overlap of self, ingroup, and outgroup: Pictorial measures of self-categorization. *Self & Identity, 1*, 535–576.
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*, 422–445.
- Singer, J. A., & Salovey, A. P. (1993). *The remembered self*. New York, NY: The Free Press.
- Swann, Jr., W. B., Buhrmester, M. D., Gómez, Á., Jetten, J., Bastian, B., Vázquez, A., . . . Zhang, A. (2014). What makes a group worth dying for? Identity fusion fosters perceptions of familial ties, promoting self-sacrifice. *Journal of Personality and Social Psychology, 106*, 912–926.
- Swann, Jr., W. B., Gómez, A., Buhrmester, M. D., López-Rodríguez, L., Jiménez, J., & Vázquez, A. (2014). Contemplating the ultimate sacrifice: Identity fusion channels pro-group affect, cognition, and moral decision-making. *Journal of Personality and Social Psychology, 106*, 713–727.
- Swann, Jr., W. B., Gómez, Á., Dovidio, J. F., Hart, S., & Jetten, J. (2010). Dying and killing for one's group: Identity fusion moderates responses to intergroup versions of the trolley problem. *Psychological Science, 21*, 1176–1183. doi:10.1177/0956797610376656
- Swann, Jr., W. B., Gómez, Á., Huici, C., Morales, F., & Hixon, J. G. (2010). Identity fusion and self-sacrifice: Arousal as catalyst of progroup fighting, dying, and helping behavior. *Journal of Personality and Social Psychology, 99*, 824–841. doi:10.1037/a0020014
- Swann, Jr., W. B., Gómez, Á., Seyle, C., & Morales, F. (2009). Identity fusion: The interplay of personal and social identities in extreme group behavior. *Journal of Personality and Social Psychology, 96*, 995–1011. doi:10.1037/a0013668
- Swann, Jr., W. B., Jetten, J., Gómez, Á., Whitehouse, H., & Bastian, B. (2012). When group membership gets personal: A theory of identity fusion. *Psychological Review, 119*, 441–456. doi:10.1037/a0028589
- 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, CA: Brooks-Cole.
- Tropp, L. R., & Wright, S. C. (2001). Ingroup identification as the inclusion of ingroup in the self. *Personality and Social Psychology Bulletin, 27*, 585–600.
- Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Oxford: Blackwell.
- Turner, J. C., Sachdev, I., & Hogg, M. A. (1983). Social categorization, interpersonal attraction and group formation. *British Journal of Social Psychology, 22*, 227–239. doi:10.1111/j.2044-8309.1983.tb00587.x
- Whitehouse, H. (2004). *Modes of religiosity: A cognitive theory of religious transmission*. Walnut Creek, CA: AltaMira Press.
- Whitehouse, H., & Lanman, J. A. (2014). The ties that bind us: Ritual, fusion and identification. *Current Anthropology, 55*(6), 1–22.
- Yuki, M. (2003). Intergroup comparison versus intragroup relationships: A cross-cultural examination of social identity theory in North American and East Asian cultural contexts. *Social Psychology Quarterly, 66*, 166–183.