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Identity Fusion and Self-Sacrifice: Arousal as a Catalyst of Pro-Group Fighting, Dying, and Helping Behavior

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Identity fusion is a feeling of oneness with the group that induces people to tether their feelings of personal agency to the group. We accordingly proposed that increasing the agency of fused persons by elevating autonomic arousal would amplify their tendency to endorse and actually enact pro-ingroup behavior. In 4 experiments, increasing autonomic arousal through physical exercise elevated heart rates and fusion-unrelated activity among all participants. Fused participants, however, uniquely responded to arousal by translating elevated agency into endorsement of pro-group activity. These effects emerged both for endorsement of extreme behaviors for the group and for overt behaviors, specifically helping behavior (donating money to needy in-group members), and the speed with which participants raced a fusion-related avatar. The effects also generalized across 3 different arousal inductions (dodgeball, wind sprints, and Exercycle). Finally, fusion-related agency partially mediated the interactive effects of fusion and arousal on pro-group behavior. Apparently, autonomic arousal increases agency and identity fusion channels increased agency into pro-group behavior.

Keywords: identity fusion, social identity, personal identity, extreme behavior, self-verification

Why do people sometimes make extraordinary sacrifices for their ingroup? Recent research has suggested that identity fusion may sometimes underlie such sacrifices. In one series of studies, those whose identities were "fused with" their country were particularly likely to endorse fighting and dying for their country (e.g., Swann, Gómez, Seyle, Morales, & Huici, 2009). Moreover, in a variation of the classic trolley dilemma, fused persons endorsed saving group members by plunging themselves in front of a speeding trolley (Swann, Gómez, Dovidio, Hart, & Jetten, in press). Here, we extend this work by asking if autonomic arousal may augment the pro-group activities of fused persons. We assume that autonomic arousal will increase agency (i.e., the capacity to initiate and control intentional behavior) for fused and nonfused persons alike. We assume further that because fused persons are not merely identified with the group but are absolutely committed to it, among such individuals, increasing agency will amplify pro-ingroup behavior beyond the effects of identification. To put these predictions in context, we contrast identity fusion with group identification.

Identification, Identity Fusion, and the Interplay of Personal and Social Identities

Both identification and identity fusion are premised on the distinction between personal and group identities (James, 1890/1950; Tajfel & Turner, 1979). Personal identities are derived from those aspects of the self that are unique to the individual self (e.g., *intelligent* or *extravert*). Social identities result from membership in social groups (e.g., *American* or *psychologist*) and align people with other group members. The key difference between identification and identity fusion is in how personal and social identities are thought to interact when people align themselves with a group.

In recent years, identification has often been conceptualized as a predominately cognitive process wherein the person ascribes qualities or characteristics of the group to the self (e.g., Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). According to some influential theorists working with the social identity theory tradition (e.g., Turner, 1985), there is a zero-sum relationship between personal and social identities: The more social identities are activated, the less personal identities are activated. One implication of this assumption is that the process of identifying with the group reduces the capacity of people to think of themselves as individual actors with personal agendas. Instead, as identification increases,

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the individual becomes depersonalized and the personal self is less apt to guide behavior. Although some theorists have taken issue with this "hostile takeover" conceptualization of the identification process (e.g., Codol, 1975; Deschamps, 1982, 1991; Postmes & Jetten, 2006; Simon, 2004; Simon & Kampmeir, 2001; Spears, 2001), it is consistent with principles such as functional antagonism as well as social identity theory's emphasis on the tendency for the social context to shape the personal self (Turner, 1985; Turner et al., 1987).

In the tradition of self-verification theory's assumption of a highly agentic personal self (e.g., Swann, 1983, in press), the identity fusion approach departs from the dominant social identity model by assuming that fused persons retain a salient personal self and associated feelings of personal agency. Although fusion could arise from a single, emotionally powerful experience with a group, in most instances, it likely grows out of several direct or indirect contacts with the members of the ingroup, outgroup, or society at large. Most significantly, these experiences cause fused persons to develop a feeling of oneness with the group and a sense of shared essence. These sentiments toward the group do not cause fused persons to lose sight of their personal selves or subjugate the personal self to the group. Instead, the fusion process merely adds group-related action as a potential mode of personal self-expression. Buttressed by a strong sense of personal agency, identity-fused individuals become galvanized to act on behalf of the group. The result is absolute, unmitigated commitment to engage in pro-group activity.[1] It is thus not surprising that fusion predicts endorsement of extreme pro-group actions even while controlling for identification (Swann et al., 2009, in press).

Insofar as fusion is associated with feelings of oneness and shared essence with another person or group, one would expect that it would be at least somewhat stable. Yet fusion is not a trait in the classical sense, as it may vary somewhat with context and is specific to particular target persons or groups (i.e., fusion with any given group is unrelated to fusion with other groups; Swann et al., 2009). In addition, there may be considerable variability in how people translate fusion to the group into behavior. For some Americans, fusion with country may mean steadfastly defending America against criticism; for others, it may mean buying American cars; for still others, it may mean sacrificing their lives in wartime. The common element, however, is that relative to nonfused people, fused people are markedly more committed to acting on behalf of the group (e.g., Swann et al., 2009, in press).

To assess identity fusion, we turned to a variation of a measurement device that was originally developed to assess attachment in close relationships. Specifically, Aron, Aron, and Smollan (1992) developed a pictorial measure of connectedness to relationship partners that consisted of a series of pictures that represented different degrees of overlap between the self and other. The *Inclusion of Other in Self Scale* (IOS) is conceptualized as a continuous measure of the degree to which people possess a "sense of being interconnected with another," a feeling that is manifested by a tendency to view the self as "including resources, perspectives, and characteristics of the other" (Aron et al., 1992, p. 598). Within this framework, overlap between the self and other is understood to grow out of a tendency for the self to incorporate aspects of the other. Although the overlap is never complete, it causes highly interconnected persons to experience confusion regarding boundaries between the self and other.

In contrast, the oneness with the group that fused persons feel is thought to be based on the perception of shared essence rather than confusion of self and other or a tendency to incorporate the other. As can be seen in Figure 1, the fused option (E) indicates that the personal self retains its uniqueness and integrity but is completely immersed in the other. Note that this completely immersed option is more extreme than the most extreme option in the IOS. Another distinction is that fused persons are not presumed to feel that the group is a part of the self as in the most extreme option of the IOS. Instead, fused individuals acknowledge that self–group influence is bidirectional: Just as the self may internalize qualities of the other, so too may the group represent an externalization of the self. Finally, this bidirectional influence process does not result in confusion of the self and other. To the contrary, for one to be absolutely committed to the other, one obviously must recognize that the group is distinct from the self.

Several group researchers (Coats, Smith, Claypool, & Banner, 2000; Smith & Henry, 1996; Tropp & Wright, 2001) adapted the IOS measure to capture the relationship of respondents to their group. Building on this work, Schubert and Otten (2002) added an option in which the self and group were completely overlapping. Swann et al. (2009) further modified this measure by creating an identity fusion scale in which participants selected from among five pictures the one that best represented their relationship with the group (for a detailed discussion of the psychometric properties of the fusion scale, see Swann et al., 2009).

To date, Swann et al. (2009, in press) have reported a series of 10 studies indicating that their pictorial measure of identity fusion predicts endorsement of extreme pro-group behavior even while controlling for identification. One way to summarize these findings is to suggest that identity fusion serves to figuratively cock the group-action trigger. If so, then it becomes important to identify the factors that prompt people to pull the trigger. One set of variables has already been experimentally documented. In particular, to test the assumption that the personal and social identities of fused persons are integrally connected, Swann et al. (2009) activated the personal selves of participants who were fused with Spain by providing them with discrepant feedback on personal qualities that were unrelated to the Spanish group identity (e.g., shy, stubborn). As expected, activating the personal selves of fused individuals did indeed raise their endorsement of extreme action on behalf of the group. In another study, the researchers activated participants' identities by asking them if they would fight to defend either themselves (activating their personal identity) or their group (activating their group identity). Whereas nonfused participants increased their endorsement of extreme action for the group only when their social self-views were activated, fused persons increased their endorsement of extreme action for the

[1] Following Ellemers, Spears, and Doojse (2002, p. 164), we distinguish *commitment* from *identification*. Whereas commitment historically features a strong action component ("A pledge to do," "The state of being bound emotionally or intellectually to a course of action or to another person or persons"), identification often emphasizes a cognitive process (e.g., "A process by which one ascribes to oneself the qualities or characteristics of another person or group"). These definitions were taken from dictionary.com (http://dictionary.reference.com/). Many phenomena could produce commitment, including identification, contractual arrangements, ties to specific group members, or feeling of oneness with the group (i.e., fusion).

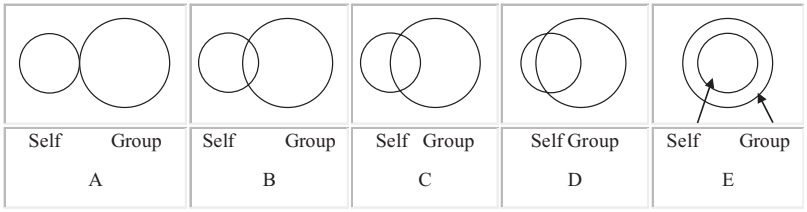

Figure 1. Measure of identity fusion. From "Identity Fusion: The Interplay of Personal and Social Identities in Extreme Group Behavior" by W. B. Swann, Jr., A. Gómez, D. C. Seyle, J. F. Morales, and C. Huici, 2009, *Journal of Personality and Social Psychology, 96,* p. 998. Copyright 2009 by the American Psychological Association.

group when either their personal or their social identities were activated. Together, these findings provide converging evidence that fusion engenders a state of absolute, unmitigated commitment to the group.

Arousal as an Amplifier of Emotion and Pro-Group Behavior

To illuminate further the mechanisms underlying identity fusion, in this report, we focused on a novel strategy for prompting fused persons to pull the group-action trigger. Given that fused individuals are poised to act as agents for the group, any manipulation that increases agency should theoretically increase pro-group behavior (cf. Reicher & Haslam, 2006). One relatively direct means of increasing agency is to increase autonomic arousal. That is, consistent with early learning theories (e.g., Hull, 1943), studies of nonhumans demonstrate that arousal of the sympathetic nervous system encourages animals to enact responses that they are predisposed to make (Jacobs & Farel, 1971). Parallel studies with humans have revealed that heightened arousal can increase in-group favoritism and stereotyping among highly identified group members (e.g., Branscombe & Wann, 1992; Wann & Branscombe, 1995). Nevertheless, identification may not moderate the tendency for arousal to amplify pro-group behaviors that are enacted by individuals acting alone, as past research has shown that identification is not strongly related to the tendency for people to act as individuals for the group (Swann et al., 2009, in press). In contrast, fusion should moderate the tendency for arousal to amplify pro-group behavior of individuals acting alone, even while controlling for identification.

One further issue of interest here is the generality of the proposed link between arousal and pro-group action among fused persons. In the Branscombe and Wann (1992) study, for example, the source of arousal (an aggressive encounter between an American and a Russian) was conceptually analogous to the outcome measure (verbal aggression against Russians). Nevertheless, some attributional models imply that the relationship between arousal and emotion may be quite general. In the most extreme case, the source of the arousal could be completely unrelated to the outcome measure. Zillmann's (1971) excitation transfer theory, for example, suggests that arousal may produce residual excitement that serves to intensify later emotional states. Diverse evidence has supported this proposition. Whereas early studies showed that nonspecific arousal increases outcomes such as aggression (e.g., Zillmann, 1971; Zillman & Bryant, 1974), subsequent studies revealed that arousing experiences produced excitation that enhanced subsequent sexual attraction (Dutton & Aron, 1974; Meston & Frohlich, 2003) and sense of humor (Cantor, Bryant, & Zillmann, 1974).

To determine if naked arousal (i.e., arousal unrelated to the focal group) would exaggerate the tendency of fused persons to advance the interest of the focal group, we conducted four experiments. All of our experiments were conducted in Spain, each included a no-arousal control group, and each included measures of identification as well as fusion with the group. In all experiments, we introduced arousal by having participants exercise. We then assessed the effects of our predictor variables (fusion, identification, and arousal) on endorsement of pro-group activity.

We were also interested in the generalizability and specificity of our findings. To determine if our effects would generalize to different arousal manipulations, we had some participants exercise in a group dodgeball game (Experiment 1); we had others run wind sprints (Experiment 2) and still others ride an Exercycle (Experiments 3–4). To extend the effects of fusion and arousal beyond the outcome variables examined in past research (i.e., intentions to fight or die for the group), in Experiments 3–4, we added two measures of actual overt behavior: how much of their own money participants donated to needy members of the focal group and how fast they raced a fusion-related avatar (the "Spanish sprinter").

To determine if our predicted effects were specific to activities associated with the group with which participants were fused, we included parallel measures of our dependent variables that were not linked to the focal group. For example, in Experiments 2–3, we asked how willing participants were to endorse extreme actions for another group of which they were members (Europe) as well as the focal group (Spain). Further, in Experiment 3, we measured donations to two entities, only one of which was related to the focal group (Spain); in Experiment 4, we measured how fast participants raced two avatars, only one of which was related to the focal group (Spain).

Finally, we included several measures that were designed to provide information regarding the mechanisms underlying our predicted effects. For example, we expected that physical exercise would increase autonomic arousal. To index arousal, in Experiments 1–4, we included a measure of heart rate. We were also interested in identifying the psychological mediator of our expected results. We reasoned that arousal would increase agency for all participants in our experiments and tested this assumption by including outcome measures in Experiments 2–4 that were unre-

lated to the focal group. We reasoned further that because fused participants regard the group as an externalization of the personal self, for such individuals, the elevated agency fostered by the arousal manipulation should produce elevated agency for the focal group. Agency for the group should, in turn, foster pro-group behavior. To test this meditational hypothesis, we included a self-report measure of fusion-related agency in Experiments 3–4. Finally, in an effort to test the rival hypothesis that the arousal manipulation might work by fostering feelings of competitiveness, we included a measure of self-perceived competitiveness in the last two experiments.

We expected that the arousal manipulations would amplify the tendency for both fused and nonfused participants to endorse activities in general (e.g., donations to a group that one is a member of but not fused with) but that it would selectively increase endorsement of fusion-related activities (e.g., donations to needy Spaniards) among fused participants. Also, we expected that the arousal manipulation would increase heart rate and agency among all participants but that self-professed agency for the group would mediate the interactive effects of fusion and arousal on pro-group behavior among fused persons only.

Preliminary Studies: Relationship of Fusion to Identification and Commitment

Prior to testing our predictions regarding the effects of fusion and arousal on pro-group activity, we conducted two preliminary investigations that were designed to provide additional information regarding the nature of identity fusion. The first issue was the relationship of fusion to identification. Although Swann et al. (2009, in press) provided evidence that fusion is a stronger predictor of extreme behavior than identification is, as measured by the scale developed by Mael and Ashforth (1992), more recently developed scales might be better suited for assessing fusion-related constructs such as oneness with and commitment to the group. For example, Leach et al. (2008) have recently developed a five-factor scale(described below) that includes some items that specifically refer to commitment and importance of the group (e.g., "I feel committed to [the group]," "Being [a group member] is an important part of how I see myself"; Leach et al., 2008, p. 165).

To assess the relative capacity of the Leach et al. (2008) scale to predict extreme behavior, in Preliminary Study 1, we had a large sample of Spanish undergraduates (N = 1,766, 1,293 women and 473 men, mean age = 31.53 years, SD = 9.48) complete Leach et al.'s (2008) measure, Mael and Ashforth's (1992) scale, the fusion scale, and a measure of endorsement of extreme actions for Spain (described in the *Method* section of Experiment 1 below). When the fusion scale and each of the five Leach et al. scales were entered as predictors into a regression with endorsement of extreme actions as the criterion, the fusion effect (B = 0.27, t = 12.89, $p < .001$) and two of the Leach et al. factors were significant (Centrality, B = 0.07, t = 4.45, $p < .001$; Solidarity, B = 0.06, t = 2.91, p = .004) but the other three were not (Self-Stereotyping, B = 0.03, t = 1.82, $p < .07$; Satisfaction and Ingroup, Homogeneity, ps $> .20$). The fusion effect was significantly higher than the effects of any of the Leach et al. subscales (zs > 6.78, ps $< .001$). When the Mael and Ashforth (1992) scale was added to the regression, significant effects emerged for fusion (B = 0.26, t = 12.30, $p < .001$), Mael and Ashforth's scale (B = 0.11, t = 5.22, $p < .001$), and two of the Leach et al. scales (Solidarity, B = 0.05, t = 2.34, $p < .05$, and Centrality, B = 0.057, $p < .001$), but the fusion effect was significantly higher than the Mael and Ashforth effect (z = 3.77, $p < .001$), and the Mael and Ashforth effect was significantly higher than the effects of any of the Leach et al. subscales (all zs > 6.78, ps $< .001$). These findings justify our use of the Mael and Ashforth scale in our experiments as the representative measure of identification.

We were also interested in the possibility that fusion would be related to commitment to the group and that both variables would predict endorsement of extreme behavior. To test this prediction, in Preliminary Study 2, we had 276 Spanish undergraduates (203 women and 73 men, mean age = 34.55 years, SD = 8.61) complete a seven-item measure of commitment to the group[2] (e.g., adapted from Rusbult & Farrell, 1983; α = .84); Mael and Ashforth's (1992) measure of identification, α = .75; the fusion scale (37.7% were fused with the group); and an index of endorsement of extreme actions for Spain (as described in Experiment 1 but ranging from 1 to 6), α = .88. We first examined the effects of fusion and identification by regressing fusion, identification, and the Fusion × Identification interaction on endorsement of extreme behavior for Spain. The regression yielded a main effect of fusion (B = 0.68, t = 14.40, $p < .001$), showing that fused participants expressed higher endorsement of extreme actions for the group than did nonfused participants (M = 2.06, SD = 1.04, vs. M = 0.63, SD = 0.48). The regression also yielded a main effect of identification (B = 0.15, t = 2.95, $p < .01$). However, fusion was a stronger predictor of endorsement of extreme behavior than identification was (z = 7.91, $p < .001$). The Fusion × Identification interaction failed to reach significance ($p > .28$).

With this evidence in hand that fusion significantly predicted endorsement of extreme actions, we proceeded to test the hypothesis that commitment would be related to both fusion and endorsement of extreme behavior. As expected, fusion was closely related to commitment (B = 0.53, $p < .001$). Although both fusion and commitment predicted endorsement of extreme actions for Spain (Bs = 0.71 and 0.36, respectively, ps $< .001$), fusion was the stronger of the two (z = 5.99, $p < .001$). When both fusion and commitment were included as predictors of extreme actions, the effect of both fusion and commitment remained significant (Bs = 0.63 and 0.15, respectively, ps $< .001$), but Sobel tests revealed that the effect of each predictor was significantly reduced (Sobel tests > 3.49, ps $< .001$). The overall pattern of results therefore provides clear evidence that fusion and commitment are correlated and fusion predicts pro-group behavior more strongly than commitment does.

Together, the results of the preliminary investigations support our assumption that fusion is an index of alignment with one's group that is related to but distinct from both identification and

[2] The items were "I want my relationship with Spain to last a very long time," "I am committed to maintaining my relationship with Spain," "I would not feel very upset if my relationship with Spain were to end in the near future" (reverse scored), "It is likely that I will consider becoming a citizen of another country within the next year" (reverse scored), "I feel very attached to Spain—very strongly linked to my country," "I want my relationship with Spain to last forever," "I am oriented toward the long-term future of my relationship with Spain (for example, I imagine being a citizen of Spain several years from now)."

commitment to the group. That is, fusion is a stronger predictor of endorsement of pro-group behavior than are identification and commitment, and there is preliminary evidence that the impact of fusion on pro-group behavior is mediated by a tendency for fusion to bolster commitment to the group.

Experiment 1: Will Increasing Arousal Through Dodgeball Amplify Extreme Behavior for the Group?

All studies reported here were conducted in Spain because the relatively high rate of fusion with their country displayed by Spaniards (approximately 30%–40%) obviated the large samples that would be necessary in many other countries (e.g., Swann et al., 2009, reported that fusion in the United States was approximately 20%). We included three predictor variables in our design: arousal, fusion, and identification.

Method

Participants. Two hundred fifty-four high school students in Madrid, Spain, participated as a part of their gym classes. Nine participants were excluded because they were not Spanish nationals, leaving 245 (99 girls and 146 boys; mean age = 15.34 years, $SD = 0.97$) participants in the final sample. Preliminary analyses of the findings from this experiment and all subsequent experiments revealed no main or interactive effects of gender.

Procedure. In this and all experiments reported in this article, participants were introduced to an investigation of the relationship of arousal to their autonomic responses and emotional reactions. With this knowledge in hand, participants entered the first portion of the two-phase procedure. All instructions and measures were in Spanish.

Phase 1. Baseline heart rates were recorded using a Polar FS1 heart rate monitor watch (this device was also used in all experiments reported in this article). Participants then completed Swann et al.'s (2009) measure of identity fusion (cf. Schubert & Otten, 2002) and Mael and Ashforth's (1992) Identification Scale ($\alpha = .82$). These measures were completed in counterbalanced order with reference to the group Spain. As in earlier research on identity fusion, fusion was treated as a dichotomous variable, such that participants were considered fused only if they endorsed the option in which the self was completely overlapping with the group (for a discussion and justification, see Swann et al., 2009). Rate of fusion in this sample was 32.7%. The correlation between fusion and identification was positive but modest, $r(243) = .33$, $p < .001$ (as in our earlier work, the correlation rose slightly, $r = .43$, if fusion was treated as a continuous scale).

Participants who had been randomly assigned to the control condition proceeded directly to the second phase of the experiment. Participants who had been assigned to the arousal condition engaged in a group activity (dodgeball) as part of their physical education class. The game is played with a single ball that is roughly the size and density of a soccer ball. In the standard version of the game, the objective is to eliminate members of the opposing team by striking them with the ball, catching a ball thrown by a member of the opposite team, or intimidating opponents into moving out of bounds while attempting to evade the ball. To diminish feelings of competition and encourage members of the class to perceive that they were all in the same superordinate group, we modified the rules of the game so that no participants were eliminated. Instead, those who were struck by the ball simply changed teams. After 5 min elapsed, the experimenter instructed participants to proceed to the second portion of the experiment.

Phase 2. To test the effectiveness of the arousal manipulation, the experimenter recorded participant's heart rates again at the beginning of the second phase of the study. We submitted heart rates to a 2 (arousal, control) × 2 (fused, nonfused) × 2 (timing: Phase 1, Phase 2, a repeated measures factor) mixed-model analysis of variance (ANOVA). An interaction between arousal and timing emerged, $F(1, 241) = 418.10$, $p < .001$, such that in the arousal condition, heart rate increased from Phase 1 to Phase 2, $F(1, 128) = 634.94$, $p < .001$ ($M = 75.12$, $SD = 10.59$, vs. $M = 104.94$, $SD = 13.22$, respectively). No such increase occurred in the control condition from Phase 1 to Phase 2, however, $F(1, 115) = 2.28$, $p > .14$ ($M = 72.94$, $SD = 11.98$, vs. $M = 71.93$, $SD = 11.24$, respectively).

The interaction between arousal and timing qualified two main effects. First, a main effect of timing emerged, $F(1, 241) = 377.87$, $p < .001$, such that heart rate increased from Phase 1 to Phase 2 ($M = 74.10$, $SD = 11.28$, vs. $M = 89.44$, $SD = 20.58$, respectively). Second, a main effect of the arousal manipulation emerged, $F(1, 241) = 131.19$, $p < .001$, in that heart rate was higher in the arousal than in the control condition ($M = 90.12$, $SD = 8.23$, vs. $M = 73.42$, $SD = 9.29$, respectively). No other effects were significant. For example, overall, arousal was unrelated to both fusion and identification.

Participants then completed the measures of endorsement of extreme behavior developed by Swann et al. (2009). For the measure of willingness to fight for the group, on 7-point scales ranging from −3 (*totally disagree*) to 3 (*totally agree*), participants rated their agreement with these five items: "I would fight someone physically threatening another Spaniard," "I would fight someone insulting or making fun of Spain as a whole," "I would help others get revenge on someone who insulted Spain," "Hurting other people is acceptable if it means protecting the group," and "I'd do anything to protect the group." For the measure of willingness to die for the group, participants indicated their agreement with two items: "I would sacrifice my life if it saved another group member's life" and "I would sacrifice my life if it gave the group status or monetary reward." Because the measures of willingness to fight and die are conceptually overlapping and highly correlated, $r(243) = .63$, $p < .001$, we combined them into a single measure that we dubbed *endorsement of extreme actions for the group*, $\alpha = .90$. In this experiment and all other experiments reported in this article, on completion, all participants were debriefed and thanked.

Results

To determine if fusion and arousal interactively predicted our outcome measures while controlling for identification, we performed a series of multiple regressions. The predictors were fusion, arousal, identification, all two-way interactions, and the triple interaction. Both fusion and arousal were effects coded (−1, 1) and, as suggested by Aiken and West (1991), identification was centered.

Endorsement of extreme actions for the group. The predicted interaction between fusion and arousal emerged, $B = 0.30$, $t(237) = 3.70$, $p < .001$. As shown in Figure 2, fused participants

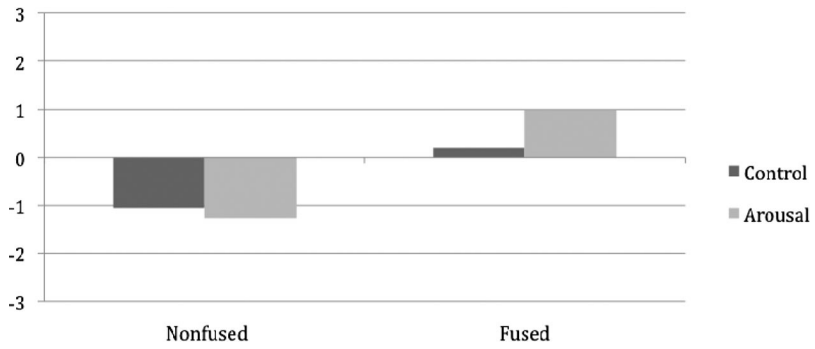

Figure 2. Study 1. Extreme actions for the group as a function of fusion and arousal. The fact that the response scale included zero should not be taken to imply that it reflects a ratio scale in which *zero* has an absolute meaning. Imputing meaning to these scores beyond their relative magnitude is akin to assuming that a device with a volume control ranging from 1–11 is louder than a device with a volume control ranging from 0–10 (e.g., Blanton & Jaccard, 2006; Doran, Murphy, & Reiner, 1984).

indicated stronger endorsement of extreme actions for the group in the arousal condition than in the control condition, $B = 0.49$, $t(237) = 3.74$, $p < .01$. However, nonfused participants were not influenced by the arousal manipulation, $B = 0.04$, $t(237) = 0.48$, $p > .72$. No interaction between identification and arousal emerged, $p > .18$.

The analysis also revealed a Fusion × Identification interaction, $B = -0.28$, $t(237) = -3.70$, $p < .001$. Follow-up analyses indicated that the tendency for identification to increase endorsement of extreme actions for the group was significant among fused participants, $B = 0.33$, $t(237) = 2.48$, $p < .05$, but somewhat stronger among nonfused participants, $B = 0.57$, $t(237) = 7.51$, $p < .001$. This surprising interaction was apparently anomalous, as it did not emerge again in any of the subsequent investigations reported here.

A main effect of fusion also emerged, such that fused participants showed more extreme actions for the group than did nonfused participants, $B = 0.79$, $t(237) = 9.81$, $p < .001$ ($M = 0.69$, $SD = 1.21$, vs. $M = -1.15$, $SD = 1.08$, respectively; in all experiments in this report, the effect of fusion was significant in both the control and the arousal conditions, all ps $< .01$). A marginal effect of arousal also emerged, $B = 0.15$, $t(237) = 1.91$, $p < .06$, indicating that participants in the arousal condition displayed stronger endorsement of extreme actions for the group than did participants in the control condition ($M = -0.39$, $SD = 1.54$, vs. $M = -0.73$, $SD = 1.24$). Finally, a main effect of identification emerged, with higher identification being associated with greater endorsement of extreme actions for the group, $B = 0.79$, $t(237) = 9.81$, $p < .001$. No other main effects were significant.

Covariation between heart rate and endorsement of extreme actions. To determine if increases in arousal were associated with endorsement of extreme actions for the group, we performed a stepwise multiple regression. Heart rate during Phase 1 was controlled for by entering it in the first step of the regression. In the second step, heart rate during Phase 2, fusion, and the interaction between heart rate during Phase 2 and fusion were entered.

The predicted interaction between heart rate at Phase 2 and fusion emerged, $B = 0.18$, $t(240) = 2.23$, $p < .05$. As expected, for fused participants, heart rate during Phase 2 predicted endorsement of extreme actions for the group, $B = 0.78$, $t(240) = 4.37$, $p < .001$. In contrast, for nonfused participants, heart rate during Phase 2 did not predict endorsement of extreme actions for the group, $B = 0.14$, $t(240) = 1.11$, $p > .25$. There was also a main effect of pulse at Phase 2, $B = 0.24$, $t(240) = 2.93$, $p < .01$, such that the higher the pulse at Phase 2, the greater the endorsement of extreme actions for the group. As expected, heart rate at Phase 1 did not predict the outcome measures. No other effects were significant.

Discussion

Our findings revealed that increasing the arousal of fused participants through group exercise increased their endorsement of extreme actions for their group. In contrast, among nonfused participants, endorsement of extreme actions remained uniformly low, even when they were aroused.

The fact that fusion but not identification interacted with arousal supports earlier evidence (Swann et al., 2009, in press) that the two measures tap fundamentally different constructs. In particular, although fused participants were no more aroused than were nonfused participants overall, when physiologically aroused, endorsement of extreme action for the group increased. It therefore appears that the fusion measure uniquely taps people's propensity to individually engage in extreme action.

Although our findings supported our predictions, interesting questions remain regarding the mechanisms underlying our effects as well as their generality. First, the group nature of the dodgeball game may have itself been arousing, as the presence of others may be arousing (e.g., Zajonc, 1965). Moreover, the fact that the other players were members of the ingroup (Spaniards) might have primed "us–them" thinking. These possibilities raise ambiguities regarding the role of arousal per se in our findings. In addition, because we only asked participants to express their willingness to endorse extreme actions for the focal group, the specificity of the arousal effect is unclear. Conceivably, the arousal manipulation may have had a very general effect, increasing the tendency of fused persons to endorse extreme actions for any group.

To resolve these ambiguities, we conducted a second experiment. To determine if the presence of a group is a necessary

condition for the arousal effect, arousal was introduced in a nongroup setting wherein individual participants ran sprints in isolation. To determine if the amplifying effects of the arousal were specific to the group with which participants were fused, in addition to assessing participants' fusion with Spain and endorsement of extreme actions for Spain, we also assessed their fusion with Europe and endorsement of extreme actions for Europe. We predicted an interaction between fusion and arousal such that the arousal manipulation would increase endorsement of extreme actions for the focal group only (i.e., fusion with Spain predicts actions for Spain only, whereas fusion with Europe predicts actions for Europe only). We expected no such interaction effects among nonfused participants.

Experiment 2: Will Increasing Arousal by Running Wind Sprints Amplify Extreme Behavior for the Group?

We included three predictor variables in our design: arousal, fusion, and identification. Whereas we introduced arousal using a group task in Experiment 1, in this experiment, we introduced arousal using an individual task.

Method

Participants. One hundred ninety Spanish high school students (69 girls and 121 boys; mean age = 15.14 years, $SD = 0.94$) participated as a part of their gym classes.

Procedure. Three modifications were introduced to the procedure used in Experiment 1. During Phase 1, we added measures of fusion and identification in which the reference group was Europe. Rate of fusion with Spain in this sample was 38.4%, and rate of fusion with Europe was 5.8%. Also, degrees of fusion with Spain and Europe were uncorrelated, $r(188) = .06$, $p > .40$, but degrees of identification with Spain and Europe were correlated, $r(188) = .44$, $p < .001$. During the second phase of the study, we also measured participants' endorsement of extreme actions for Europe as well as Spain (αs = .85 and .90, respectively). The order of the measures targeting Spain and Europe were counterbalanced. Finally, we changed the arousal manipulation from a group to an individual task. Instead of having participants play dodgeball, we had them run short, 90-s sprints, in which they were to try to increase their speed with each successive sprint. The correlation between fusion and identification with Spain was positive but modest, $r(188) = .40$, $p < .001$.

To test the effectiveness of the arousal manipulation, we submitted heart rates to a 2 (arousal, control) × 2 (fused, nonfused) × 2 (timing: Phase 1, Phase 2, a repeated measures factor) mixed-model ANOVA of heart rates. An Arousal × Timing interaction emerged, $F(1, 186) = 299.77$, $p < .001$, such that heart rate increased from Phase 1 to Phase 2 in the arousal condition, $F(1, 106) = 450.2$, $p < .001$ ($M = 74.18$, $SD = 13.37$, vs. $M = 108.89$, $SD = 18.38$, respectively), but not in the control condition, $F(1, 82) = 2.42$, $p > .11$, ($M = 73.89$, $SD = 10.52$, vs. $M = 70.71$, $SD = 9.50$, respectively). The interaction between arousal and timing qualified two main effects. First, a main effect of timing emerged, $F(1, 186) = 202.87$, $p < .001$, such that heart rate increased from Phase 1 to Phase 2 ($M = 74.05$, $SD = 12.18$, vs. $M = 92.44$, $SD = 24.51$, respectively). Second, a main effect of the arousal manipulation emerged, $F(1, 186) = 118.66$, $p < .001$, in that heart rate was higher in the arousal condition than in the control condition ($M = 91.53$, $SD = 7.16$, vs. $M = 72.25$, $SD = 8.19$). No other effects were significant.

Results

Endorsement of extreme actions. To determine if fusion and arousal interactively predicted our outcome measures, we performed a mixed-model regression analysis. We sought to determine if (a) arousal interacted with fusion with Spain to predict extreme actions for Spain (but not for Europe) and (b) arousal interacted with fusion with Europe to predict extreme actions for Europe (but not for Spain). To that end, we regressed extreme actions for Spain and extreme actions for Europe (a repeated measures variable) on the following predictors: arousal (−1, 1), fusion with Spain (−1, 1), Arousal × Fusion With Spain, fusion with Europe (−1, 1), Arousal × Fusion With Europe, and identification with Spain and Europe. Each mean was centered. The interactions involving identification were paired with the appropriate country (e.g., identification with Spain was paired with fusion with Spain), but they were not crossed with mismatched targets (e.g., identification with Spain was not paired with fusion with Europe).

The predicted three-way interaction between Arousal × Fusion With Spain × Extreme Actions for Spain and Europe emerged, $F(1, 177) = 4.83$, $p < .05$. To evaluate this interaction, the Arousal × Fusion With Spain effects were examined separately for extreme actions for Spain and Europe, respectively. Arousal interacted with fusion with Spain to predict extreme actions for Spain, $F(1, 182) = 6.64$, $p < .001$. As shown in the left side of Figure 3A, for fused participants, arousal increased endorsement of extreme actions for Spain, $F(1, 182) = 13.62$, $p < .001$, but for nonfused participants, arousal had no impact, $F(1, 182) = 1.71$, $p > .19$. Also as expected, as shown in the right side of Figure 3A, arousal did not interact with fusion with Spain to predict extreme actions for Europe, $F(1, 182) = 0.07$, $p > .79$.

A second predicted three-way interaction between Arousal × Fusion With Europe × Extreme Actions for Spain and Europe also emerged, $F(1, 177) = 4.36$, $p < .05$. To evaluate this interaction, we examined the Arousal × Fusion With Europe effects separately for extreme actions for Europe and Spain. Arousal interacted with fusion with Europe to predict extreme actions for Europe, $F(1, 182) = 5.36$, $p < .01$. As shown in the right side of Figure 3B, for fused participants, arousal increased endorsement of extreme actions for the group, $F(1, 182) = 4.57$, $p < .05$, but for nonfused participants, arousal had no impact, $F(1, 182) = 0.92$, $p > .33$. In contrast, the left side of Figure 3B reveals that arousal did not interact with fusion with Europe to predict extreme actions for Spain, $F(1, 182) = 0.09$, $p > .78$. No higher order interactions were significant, ps > .15.

Covariation between heart rate and endorsement of extreme actions for Spain. To determine if increases in arousal were associated with endorsement of extreme actions for the group, we performed a stepwise multiple regression. Heart rate during Phase 1 was controlled for by entering it in the first step of the regression. In the second step, heart rate during Phase 2, fusion, and the interaction between heart rate during Phase 2 and fusion were entered.

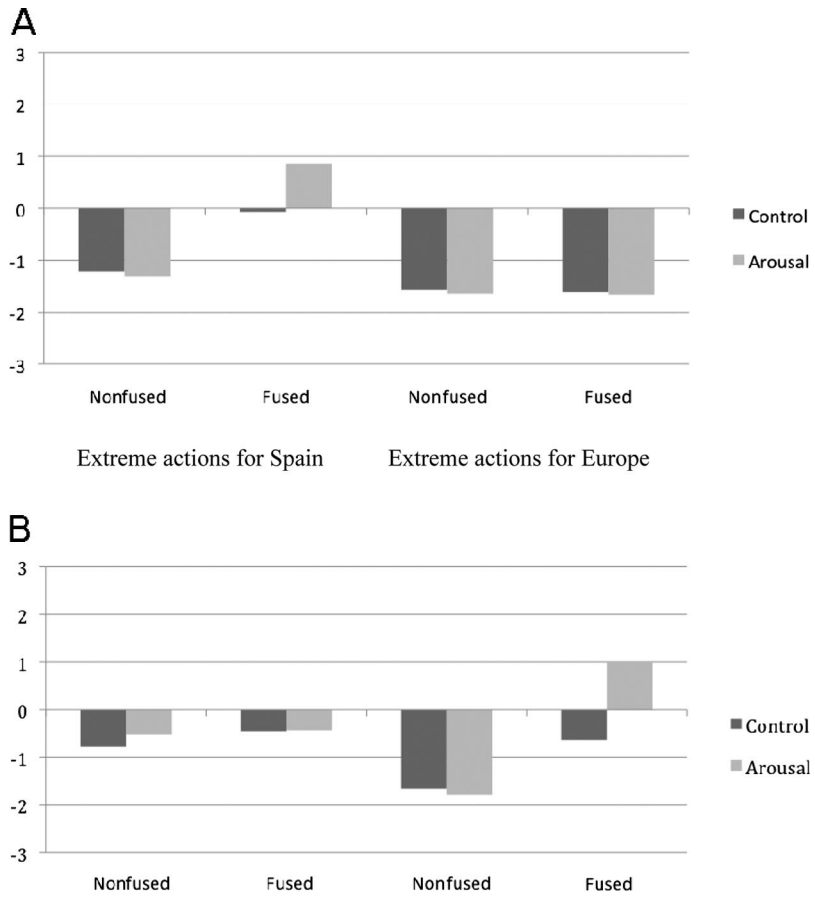

Figure 3. Experiment 2. Extreme actions for the group as a function of Fusion With Spain × Arousal (A) and as a function of Fusion With Europe × Arousal (B).

The predicted interaction between heart rate at Phase 2 and fusion emerged, $B = 0.26$, $t(185) = 2.48$, $p < .01$. As expected, for fused participants, heart rate during Phase 2 predicted endorsement of extreme actions for Spain, $B = 0.51$, $t(185) = 2.83$, $p < .01$. In contrast, for nonfused participants, heart rate during Phase 2 did not predict endorsement of extreme actions for Spain, $B = -0.01$, $t(185) = 0.69$, $p > .93$. There was also a main effect of pulse at Phase 2, $B = 0.26$, $t(185) = 1.39$, $p < .05$, such that the higher the pulse at Phase 2, the stronger the endorsement of extreme actions for the group. As expected, heart rate at Phase 1 did not predict the outcome measures.

Covariation between heart rate and endorsement of extreme actions for Europe. To determine if increases in arousal were associated with endorsement of extreme actions for the group, we performed a stepwise multiple regression. Heart rate during Phase 1 was controlled for by entering it in the first step of the regression. In the second step, heart rate during Phase 2, fusion, and the interaction between heart rate during Phase 2 and fusion were entered.

The predicted interaction between heart rate at Phase 2 and fusion emerged, $B = 0.08$, $t(185) = 3.02$, $p < .01$. As expected, for fused participants, heart rate during Phase 2 predicted endorsement of extreme actions for Europe, $B = 0.61$, $t(185) = 1.99$, $p < .05$. In contrast, for nonfused participants, heart rate during Phase 2 did not predict endorsement of extreme actions for Europe, $B = 0.04$, $t(185) = 0.40$, $p > .61$. There was also a main effect of pulse at Phase 2, $B = 0.12$, $t(185) = 6.79$, $p < .001$, in that the higher the pulse at Phase 2, the greater the endorsement of extreme actions for the group. As expected, heart rate at Phase 1 did not predict the outcome measures.

Discussion

As in Experiment 1, our findings indicate that raising the arousal of participants through exercise increased their endorsement of extreme actions for the group with which they were fused. This effect was not contingent on exercising in a group context, for in Experiment 2, arousal was induced among participants exercising alone. As in Experiment 1, although fused participants were no more aroused than nonfused participants were overall, fusion interacted with arousal to produce substantial endorsement of extreme behavior for the focal group. At the same time, identification did not interact with arousal in predicting endorsement of extreme action for Spain, thus lending further support to the notion that the fusion measure uniquely taps people's propensity for extreme behavior. In short, when fused persons' agency was augmented by physiological arousal, their endorsement of extreme action increased.

The results of Experiment 2 also support our expectation that our effects would be specific to the group with which participants were fused. That is, there was no evidence of an interaction between arousal and fusion with Spain when we examined extreme actions for Europe. At the same time, our effect replicated in that arousal did foster endorsement of extreme actions for Europe when fusion with Europe was entered as a predictor in our analyses. That said, this replication effect was based on some cells with small sample sizes. As such, we sought to replicate this effect in Experiment 3.

Another goal of Experiment 3 was to learn more about the mediators of our predicted arousal effect. By having participants exercise alone in Experiment 2, we diminished the likelihood that the arousal manipulation fostered feelings of competitiveness. Nevertheless, the fact that we timed participants' sprints in the arousal condition may have triggered feelings of competitiveness and these feelings may have produced our effects independent of the effect of arousal. To rule out this possibility and thereby strengthen our case that arousal per se produced our effects, in Experiment 3, we manipulated arousal by having participants ride an exercycle in private for 10 min. The experimenter was careful to avoid any mention of competition or comparison of the performance of participants with the performance of other participants. To determine if our attempts to avoid arousing feelings of competitiveness were successful, after the arousal manipulation, we had participants complete a measure of their feelings of competitiveness at the moment. Furthermore, in Experiment 3, we added an additional measure that was designed to tap the construct that we expected to mediate the results: fusion-related agency. We expected that for fused participants, heightened agency produced by the arousal manipulation would carry over onto the group with which they were fused and this would, in turn, trigger more pro-group behavior.

A final goal of Experiment 3 was to determine if our effects would generalize to an overt behavioral measure of pro-group activity. We focused on helping behavior: how much money participants were willing to donate to needy Spaniards (fusion-related donation) versus a fund for a party at their high school (fusion-unrelated donation). We expected that heightened feelings of agency produced by the arousal manipulation would increase the extent to which all participants donated to the high school party but that such feelings would motivate especially large donations to needy Spaniards among participants who were fused with Spain.

Experiment 3: Will Increasing Arousal by Riding an Exercycle Amplify Pro-Group Behavior for the Group?

We included three predictor variables in our design: arousal, fusion, and identification. In this study, however, we increased arousal by having participants in the arousal condition ride an Exercycle in private for approximately 10 min (pilot testing indicated that this was enough time to produce a 20% increase in heart rate). After this, participants completed the same indices of endorsement of extreme actions for Spain and Europe used in Experiment 2. In addition, participants completed a measure of fusion with their high school (fusion with high school was unrelated to fusion with Spain, $r[118] = .04$, $p > .66$, and only 9.2% of participants were fused with the high school, which precluded the possibility of using it as a predictor given our sample size. Including fusion with school in the first step of the regressions reported below did not alter our findings, however).

In this experiment, we added a new dependent variable: participants' willingness to donate their personal funds to two entities, a fund for needy Spaniards and a fund for a high school party. The amount participants chose to donate each fund was recorded. We assumed that the needy Spaniard donation would be relevant to fusion with Spain but that the school party donation would not. Finally, to determine if fusion-related agency mediated the predicted relationship between arousal and the outcome measures, we included three items that were designed to measure this construct.

Method

Participants. One hundred twenty Spanish high school students (38 girls, 80 boys, and two who did not indicate sex; mean age = 16 years, $SD = 0.77$) in Madrid took part in this experiment.

Procedure. The procedure followed that of Experiment 2 with a few modifications. Participants in the arousal condition were brought to the gym individually. During the first phase of the experiment, we measured heart rates and then had participants complete Swann et al.'s (2009) measure of identity fusion and Mael and Ashforth's (1992) Identification Scale ($\alpha = .74$). These measures were completed in counterbalanced order and with reference to the groups Spain and Europe. Rate of fusion with Spain in this sample was 39.2%, and rate of fusion with Europe was 15%. Also, degrees of fusion with Spain and Europe were uncorrelated, $r(118) = .10$, $p > .27$, but degrees of identification with Spain and Europe were correlated, $r(118) = .53$, $p < .001$. The correlation between fusion and identification with Spain was positive but modest, $r(118) = .19$, $p < .05$.

Participants who had been randomly assigned to the control condition proceeded directly to the second phase of the study. Participants who had been assigned to the arousal condition engaged in an individual activity (riding a bike) as part of their physical education class. After 10 min elapsed, the experimenter instructed participants to proceed to the second portion of the study.

Phase 2. To test the effectiveness of the arousal manipulation, the experimenter recorded participant's heart rates again at the beginning of the second phase of the experiment. We submitted heart rates to a 2 (arousal, control) × 2 (fused, nonfused) × 2 (timing: Phase 1, Phase 2, a repeated measures factor) mixed-model ANOVA of heart rates. An Arousal × Timing interaction emerged, $F(1, 116) = 302.12$, $p < .001$, such that heart rate increased from Phase 1 to Phase 2 in the arousal condition, $F(1, 52) = 372.83$, $p < .001$ ($M = 78.15$, $SD = 12.00$, vs. $M = 129.04$, $SD = 20.18$, respectively), but not in the control condition, $F(1, 66) = 1.55$, $p > .22$ ($M = 64.57$, $SD = 11.63$, vs. $M = 65.79$, $SD = 10.46$, respectively).

The interaction between arousal and timing qualified two main effects. First, a main effect of timing emerged, $F(1, 116) = 337.62$, $p < .001$, such that heart rate increased from Phase 1 to Phase 2 ($M = 70.57$, $SD = 13.55$, vs. $M = 93.72$, $SD = 35.12$, respectively). Second, a main effect of the arousal manipulation emerged, $F(1, 116) = 276.82$, $p < .001$, in that heart rate was higher in the arousal condition than in the control condition ($M = 103.59$, $SD =$

13.55, vs. $M = 65.18$, $SD = 10.30$, respectively). No other effects were significant.

Agency for the group. For the measure of agency, we wrote three items based on Haggard and Tsakiris's (2009) discussion of the agency construct. Participants responded to three items with reference to Spain. On 7-point scales ranging from 0 (*totally disagree*) to 6 (*totally agree*), participants rated their agreement with these items: "I have as much control over the group's outcomes as my own actions," "I feel responsible for what happens to the group," and "I feel responsible for what the group does." These items formed a cohesive scale, $\alpha = .85$.

Outcome variables. In counterbalanced order, participants completed the same measures of extreme actions for Spain and Europe as were used in Experiment 2, αs = .93 and .84, respectively. After they were done, to rule out the possibility that the arousal manipulation might trigger feelings of competitiveness, we had participants answer two questions with regard to how they were feeling at the moment. On scales ranging from 0 (*totally disagree*) to 6 (*totally agree*), they indicated their level of agreement with the statements "I love competition" and "When I play a game, I always play to win." Responses to these two items were closely associated, $\alpha = .86$.

Finally, as the experiment was ostensibly drawing to a close, the experimenter revealed that he was able to pay each participant €10 (approximately $12.50) for his or her participation. He then indicated, in counterbalanced order, that the participants had the option of donating €5 or a portion of that amount to a fund for needy Spaniards and the other €5 or a portion of that amount to a high school party that would be occur at the end of the school year. The amount participants chose to donate was recorded.

Results

Endorsement of extreme actions. To determine if fusion and arousal interactively predicted our outcome measures, we performed the same mixed-model regression analysis reported for Experiment 2. Once again, we sought to determine if (a) arousal interacted with fusion with Spain to predict extreme actions for Spain (but not for Europe) and (b) arousal interacted with fusion with Europe to predict extreme actions for Europe (but not for Spain). We accordingly regressed extreme actions for Spain and extreme actions for Europe (a repeated measures variable) on the following predictors: arousal (−1, 1), fusion with Spain (−1, 1), Arousal × Fusion With Spain, fusion with Europe (−1, 1), Arousal × Fusion With Europe, and identification with Spain and Europe. Each mean was centered. The interactions involving identification were paired with the appropriate country (e.g., identification with Spain was paired with fusion with Spain), but they were not crossed with mismatched targets (e.g., identification with Spain was not paired with fusion with Europe).

The predicted three-way interaction between Arousal × Fusion With Spain × Extreme Actions for Spain and Europe emerged, $F(1, 107) = 39.79$, $p < .001$. To evaluate this interaction, we examined the effects of arousal and fusion with Spain separately for extreme actions for Spain and Europe, respectively. Arousal interacted with fusion with Spain to predict extreme actions for Spain, $F(1, 112) = 54.70$, $p < .001$. As shown on the left side of Figure 4A, for fused participants, arousal increased endorsement of extreme actions for the group, $F(1, 112) = 59.37$, $p < .001$, but for nonfused participants, arousal had no impact, $F(1, 112) = 2.76$, $p > .10$. In contrast, the data plotted on the right side of Figure 4A show that arousal did not interact with fusion with Spain to predict extreme actions for Europe, $F(1, 112) = 2.34$, $p > .12$.

The second predicted three-way interaction between Arousal × Fusion With Europe × Extreme Actions for Spain and Europe also emerged, $F(1, 107) = 8.66$, $p < .01$. To evaluate this interaction, we examined the effects of arousal and fusion with Europe separately for extreme actions for Europe and Spain, respectively. Arousal interacted with fusion with Europe to predict extreme actions for Europe, $F(1, 112) = 20.89$, $p < .001$. As shown on the right side of Figure 4B, for fused participants, arousal increased endorsement of extreme actions for the group, $F(1, 112) = 8.53$, $p < .01$, but for nonfused participants, arousal had no impact, $F(1, 112) = 0.40$, $p > .63$. In contrast, the graph displayed on the left side of Figure 4B indicates that arousal did not interact with fusion with Europe to predict extreme actions for Spain, $F(1, 112) = 2.23$, $p > .13$. No higher order interactions were significant, ps > .19.

Covariation between heart rate and endorsement of extreme behaviors for Spain. To determine if increases in arousal were associated with endorsement of extreme actions for the group, we performed a stepwise multiple regression. Heart rate during Phase 1 was controlled in the regression by entering it in the first step. In the second step, heart rate during Phase 2, fusion, and the interaction between heart rate during Phase 2 and fusion were entered.

The predicted interaction between heart rate at Phase 2 and fusion emerged, $B = 0.53$, $t(115) = 5.54$, $p < .001$. As expected, for fused participants, heart rate during Phase 2 predicted endorsement of extreme actions for Spain, $B = 1.45$, $t(115) = 7.39$, $p < .001$. In contrast, for nonfused participants, heart rate during Phase 2 did not predict endorsement of extreme actions for Spain, $B = 0.15$, $t(115) = 1.09$, $p > .45$. There was also a main effect of pulse at Phase 2, $B = 0.52$, $t(115) = 4.30$, $p < .001$, and the higher the pulse at Phase 2, the greater the endorsement of extreme actions for the focal group. As expected, heart rate at Phase 1 did not predict the outcome measures.

Covariation between heart rate and endorsement of extreme behaviors for Europe. To determine if increases in arousal were associated with endorsement of extreme actions for the group, we performed a stepwise multiple regression. Heart rate during Phase 1 was controlled for in the regression by entering it in the first step. In the second step, heart rate during Phase 2, fusion, and the interaction between heart rate during Phase 2 and fusion were entered.

The predicted interaction between heart rate at Phase 2 and fusion emerged, $B = 0.37$, $t(115) = 5.79$, $p < .001$. As expected, for fused participants, heart rate during Phase 2 predicted endorsement of extreme actions for Europe, $B = 0.37$, $t(115) = 2.10$, $p < .05$. In contrast, for nonfused participants, heart rate during Phase 2 did not predict endorsement of extreme actions for Europe, $B = -0.03$, $t(115) = 0.30$, $p > .73$. There was also a main effect of pulse at Phase 2, $B = 0.45$, $t(115) = 5.62$, $p < .001$, and the higher the pulse at Phase 2, the greater the endorsement of extreme actions for the focal group. As expected, heart rate at Phase 1 did not predict the outcome measures.

Agency as mediator of the impact of arousal on extreme actions for Spain. Prior to conducting the meditational analysis, we examined the impact of our predictor variables on fusion-

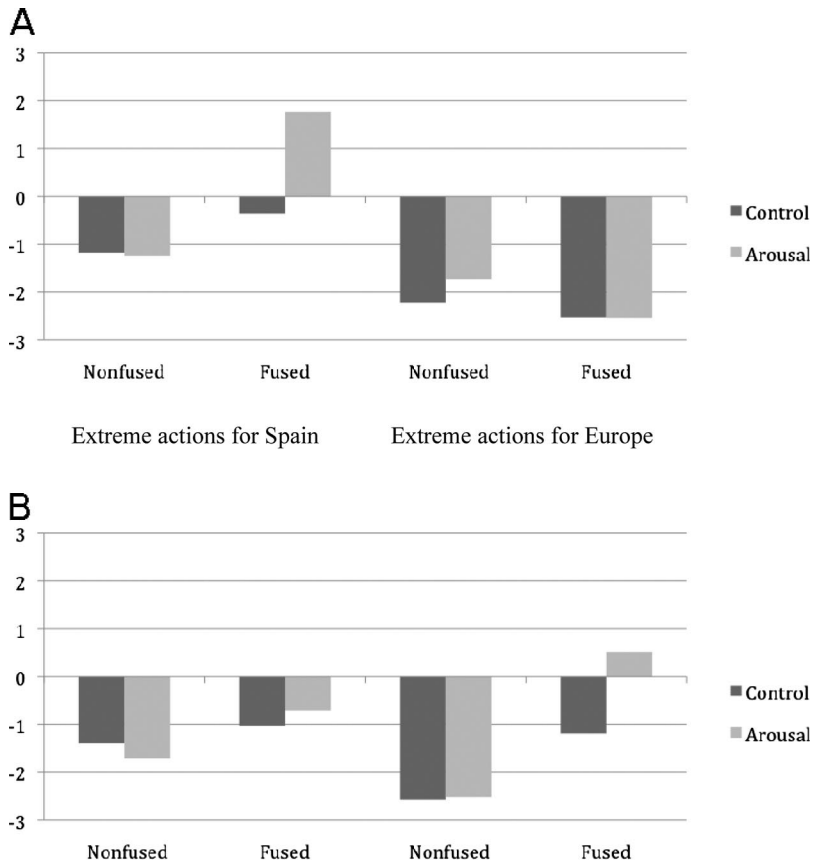

Figure 4. Experiment 3. Extreme actions for the group as a function of fusion with Spain and arousal (A) and as a function of fusion with Europe and arousal (B).

related agency. A multiple regression analysis yielded the predicted Fusion × Arousal interaction, $B = 0.35$, $t(112) = 4.88$, $p < .001$. For fused participants, arousal strongly increased fusion-related agency, $B = 0.99$, $t(112) = 9.46$, $p < .001$ ($M = 4.25$, $SD = 0.96$, vs. $M = 2.85$, $SD = 0.79$, for aroused and nonaroused participants, respectively); in contrast, among nonfused participants, arousal had a weaker but still significant tendency to increase fusion-related agency, $B = 0.28$, $t(112) = 3.19$, $p < .05$ ($M = 2.98$, $SD = 1.15$, vs. $M = 2.50$, $SD = 0.74$, for aroused and nonaroused participants, respectively). The Fusion × Arousal interaction qualified a main effect of fusion, wherein fused participants showed more agency associated with the group than did nonfused participants, $B = 0.73$, $t(112) = 10.10$, $p < .001$ ($M = 3.77$, $SD = 1.12$, and $M = 2.08$, $SD = 0.52$, respectively), as well as a main effect of arousal, $B = 0.33$, $t(112) = 4.64$, $p < .001$, wherein participants in the arousal condition displayed more agency associated with the group than did participants in the control condition ($Ms = 3.34$, $SD = 1.35$, vs. $M = 2.27$, $SD = 0.68$, respectively). No other significant effects emerged.

To test whether the interactive effect of fusion and arousal on endorsement of extreme actions for Spain was partially mediated by agency associated with Spain, we conducted a mediated moderation analysis. Following Preacher and Hayes (2008), we controlled the main effects of fusion and arousal by including them as covariates (see Figure 5). Using the SPSS macro provided by Preacher and Hayes (2008), we conducted a bootstrapping test (n boots = 5,000) for the model. Results showed that, as predicted, agency partially mediated the Fusion × Arousal interaction on extreme actions for the group (the 95% confidence interval [CI; 0.0508, 0.2533] referred to the product of the two paths that make up the indirect pathway).

Donations to the needy Spaniard (fusion-related) and school party (fusion-unrelated) funds. To determine if fusion with Spain and arousal interactively predicted fusion-related and fusion-unrelated donations, we performed a mixed-model regression of the amount of the two donations (Cohen, Cohen, West, & Aiken, 2003). Such an analysis permits testing of the effects of a continuous independent variable in a repeated measures design. Scores on the two donation scales were the repeated factor, and fusion, arousal, identification, and their interactions were between factors.

The mixed-model analysis revealed the predicted three-way interaction between fusion, arousal, and donation type, $F(1, 112) = 4.30$, $p < .05$. To evaluate this interaction, we examined the effects of fusion and arousal on donations to the two funds separately. For donations to the needy Spaniard fund, fusion interacted with arousal to predict donation, $B = 0.56$, $t(112) = 4.46$, $p < .001$. As can be seen on the left side of Figure 6, fused participants donated more in the arousal condition than in the control condition, $B = 1.63$, $t(112) = 8.87$, $p < .001$. In contrast,

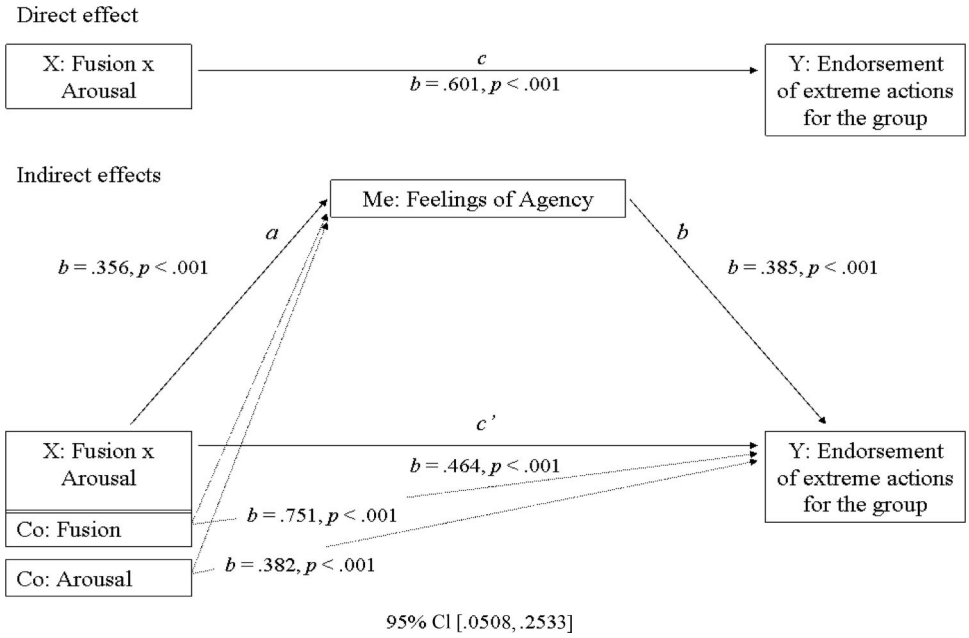

Figure 5. Experiment 3: Agency for Spain partially mediates interactive effects of Fusion × Arousal on extreme actions for Spain. CI = confidence interval.

among nonfused participants, no difference between the arousal and control conditions emerged, $B = 0.40$, $t(112) = 1.69$, $p > .10$.

For the school party donations, the Fusion × Arousal interaction was not significant, $B = -0.02$, $t(112) = -0.21$, $p > 83$. Inspection of the right side of Figure 6 reveals only a main effect of arousal, $B = 0.74$, $t(112) = 8.28$, $p < .001$, indicating that all participants donated more in the arousal condition than in the control condition ($M = 3.32$, $SD = 0.85$, vs. $M = 1.78$, $SD = 0.87$, respectively). None of the foregoing findings were qualified by higher order interactions.

Finally, we tested whether fusion-related agency mediated the interactive effects of fusion and arousal on donation. As indicated by the fact that the CI of the bootstrapping analysis included zero, there was no evidence of mediation. This finding is surprising given that agency did partially mediate the relationship of our predictors to endorsement of extreme behavior. Inspection of the variance on the donation measure, however, revealed that fused participants donated most of their money to the needy Spaniard fund, and this ceiling effect may have undermined the mediation effect. In an effort to find a measure of overt behavior that would display more variability, we replaced the donation variable with a new dependent variable in Experiment 4.

Feelings of competitiveness. The multiple regression analysis in which arousal, fusion, and their interaction were predictors and feelings of competitiveness were the outcome revealed no main or interactive effects, $ps > .60$. This finding argues against the possibility that the arousal manipulation influenced the outcome variables because it increased feelings of competitiveness.

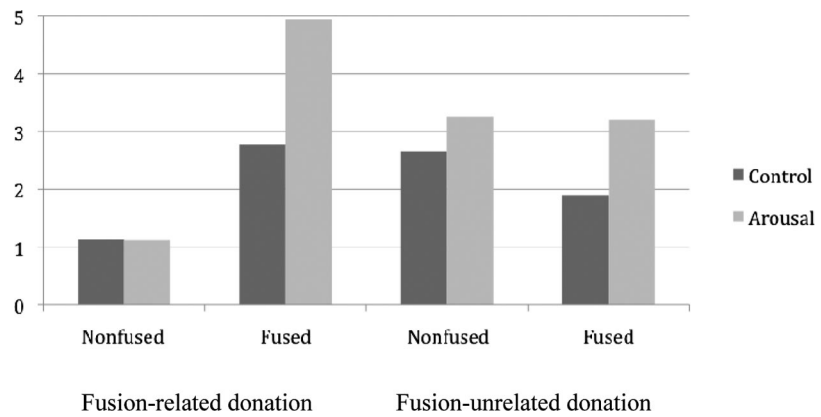

Figure 6. Experiment 3: Donation size as a function of fusion and arousal.

Discussion

As in the first two experiments, increasing the autonomic arousal of fused participants through exercise increased their endorsement of extreme actions, but only for the group with which they were fused. For example, among participants in the arousal conditions, just as fusion with Spain predicted endorsement of extreme actions for Spain but not Europe, fusion with Europe predicted endorsement of extreme actions for Europe but not Spain.

Whereas several studies have now documented a link between fusion and endorsement of extreme actions (Swann et al., 2009, in press), this is the first study to demonstrate a link between fusion and an overt behavior: participants' donations to needy in-group members. This finding also extends the effects of fusion to a new response class: helping behavior. Furthermore, we once again discovered that the effects of fusion were specific to behaviors that were relevant to participants' fused state. In particular, it was only among participants who were fused with Spain that arousal increased contributions to a fusion-related domain (needy Spaniards).

A somewhat surprising result here was that the arousal manipulation increased the tendency of all participants (regardless of fusion with Spain) to donate to the school party but not to endorse extreme actions for Europe. Because both of these outcome measures are unrelated to fusion with Spain, we expected that arousal would increase endorsement of both. In hindsight, we believe that the tendency for arousal to influence school party donations but not endorsement of extreme behavior for Europe reflects a tendency for our Spanish high school students to feel more strongly aligned with their high school than with Europe. Be this as it may, the fact that arousal increased the tendency of all participants to donate to the school party supports our assumption that the arousal manipulation boosted all participants' agency. At the same time, arousal only bolstered fusion-related agency for fused participants.

Spontaneous comments of participants made at the end of the sessions offered further testimony to how much they were willing to do for their group. In particular, after the experimenter recorded their donations, roughly half of the fused participants in the arousal condition (but no other participants) spontaneously offered to augment their €5 contribution to needy Spaniards with additional funds that they happened to have with them! Such was the power of fusion and arousal as interactive motivators of helping behavior.

One final contribution of this study was the evidence that fusion-related agency partially mediated the interactive effects of fusion and arousal on endorsement of extreme actions. Although arousal increased fusion-related agency among all participants, the increase was especially pronounced among fused participants. Moreover, among fused participants, the increase in fusion-related agency caused by arousal fostered more pro-group behavior.

Although the results of Experiment 3 supported most of our predictions, a skeptic could argue that our evidence that fused participants were more inclined to help when aroused is not much of an extension beyond our earlier evidence that they were more willing to engage in extreme actions for the group. After all, both behaviors involve sacrificing something for the group; it is just that fighting and dying are typically excluded from the response class of helping (for an exception, see Tobeña, 2009). In addition, critics could point out that although fusion-related agency partially mediated the relationship between our predictor variables and endorsement of extreme actions, it did not mediate the relationship of our predictor variables to donation behavior.

To address both of these criticisms, in Experiment 4, we turned to a new outcome measure: motor behavior. This measure is clearly removed from the responses examined in previous identity fusion research, and we hoped that responses to this dependent measure would display more variance than did the donation measure used in Experiment 3. The specific motor behavior we examined involved a video game in which the speed with which participants tapped two computer keys controlled the speed of two avatars. One avatar (the "Spanish sprinter") wore the Spanish National team t-shirt; the other avatar (the "generic sprinter") wore a plain t-shirt. We assumed that the Spanish sprinter would be perceived as more relevant to Spain than would the generic sprinter.

Overall, we predicted that the findings would parallel the pattern of donations that emerged in Experiment 3. In particular, we expected that when participants were racing the Spanish sprinter, higher arousal would produce faster times among fused as compared with nonfused participants. In contrast, we expected that when participants were racing the generic sprinter, arousal would promote speediness to an equal degree among fused and nonfused participants.

Experiment 4: Will Increasing Arousal by Riding an Exercycle Motivate Fused Persons to Make the Spanish Sprinter Run Faster?

We included three predictor variables in our design: arousal, fusion, and identification. As in Experiment 3, we increased arousal using an exercycle, and, in addition to the other indices, we had participants complete a measure of fusion with their high school (only 7.6% of participants were fused with their high school, and high school fusion was unrelated to fusion with Spain, $r[112] = -.09$, $p > .35$). The key addition here was a new dependent variable: participants' performance on a video game in which they were to race two avatars through a 100-m race.

Method

Participants. One hundred twenty-eight Spanish high school students in Madrid took part in this experiment. The data from 14 participants were not entered into the analysis because these participants indicated that they were very familiar with the game, introducing the likely possibility that their performance would be at ceiling. This left 114 participants (39 girls and 75 boys; mean age = 16.01 years, $SD = 0.78$) for analysis.

Procedure. The procedure followed that of Experiment 3. During the first phase of the experiment, we measured heart rates and then had participants complete Swann et al.'s (2009) measure of identity fusion and Mael and Ashforth's (1992) Identification Scale to measure identification with Spain ($\alpha = .73$). Rate of fusion with Spain in this sample was 38.6%. The correlation between fusion and identification with Spain was positive but only approached significance, $r(112) = .18$, $p < .06$.

Participants in the arousal condition were approached individually and asked to ride a stationary bike in a private section of the

gym as part of their physical education class. After 10 min elapsed, the experimenter instructed participants to proceed to the second portion of the study. Participants who had been randomly assigned to the control condition proceeded directly to the second phase of the study.

Phase 2. To test the effectiveness of the arousal manipulation, the experimenter recorded participant's heart rates again at the beginning of the second phase of the experiment. We submitted heart rates to a 2 (arousal, control) × 2 (fused, nonfused) × 2 (timing: Phase 1, Phase 2, a repeated measures factor) mixed-model ANOVA of heart rates. An Arousal × Timing interaction emerged, $F(1, 110) = 259.01$, $p < .001$, such that heart rate increased from Phase 1 to Phase 2 in the arousal condition, $F(1, 50) = 347.71$, $p < .001$ ($M = 77.80$, $SD = 12.13$, vs. $M = 128.66$, $SD = 20.55$, respectively), but not in the control condition, $F(1, 64) = 1.57$, $p > .21$ ($M = 64.72$, $SD = 11.86$, vs. $M = 66.00$, $SD = 10.65$, respectively). The interaction between arousal and timing qualified two main effects. First, a main effect of timing emerged, $F(1, 110) = 294.25$, $p < .001$, such that heart rate increased from Phase 1 to Phase 2 ($M = 70.46$, $SD = 13.60$, vs. $M = 92.48$, $SD = 24.95$, respectively). Second, a main effect of the arousal manipulation emerged, $F(1, 110) = 225.55$, $p < .001$, in that heart rate was higher in the arousal condition than in the control condition ($M = 104.11$, $SD = 9.15$, vs. $M = 63.94$, $SD = 12.45$, respectively). No other effects were significant.

Agency for the group. For the measure of fusion-related agency and competitiveness, we used the same measures used in Experiment 3; αs = .89 and .87, respectively.

Outcome variables. Finally, participants were introduced to a video game in which their goal was to race an avatar though a 100-m race as quickly as possible. Cognizant of evidence that arousal can interfere with performance on complex tasks (Anderson, Revelle, & Lynch, 1989), we selected a task that was quite simple. To move the avatar's left leg, participants struck the ← key with a finger from their left hand; to move the right leg, they struck the → key with a finger from their right hand. The avatar's speed varied as a function of how rapidly participants struck the keys.

After two practice trials, participants ran the race twice. In counterbalanced order, the participants raced the Spanish and generic sprinters. The amount of time participants took to bring each avatar to the finish line was recorded.

Results

Speediness of the generic and Spanish sprinters. To determine if fusion with Spain and arousal interactively predicted speediness of the two sprinters, we performed a mixed-model regression of the speed with which participants raced the avatars (Cohen et al., 2003). Time on the two races was a repeated factor; fusion, arousal, identification, and their interactions were between factors.

The mixed-model analysis revealed the predicted three-way interaction between fusion, arousal, and sprinter, $F(1, 106) = 4.64$, $p < .05$. To evaluate this interaction, the effects of fusion and arousal were examined separately for the Spanish and generic sprinters.

For the Spanish sprinter, fusion interacted with arousal to predict speed, $B = -0.22$, $t(106) = -4.91$, $p < .001$. As can be seen on the left side of Figure 7, fused participants were faster in the arousal condition than in the control condition, $B = -0.61$, $t(106) = -8.58$, $p < .001$. In contrast, among nonfused participants, no difference emerged between the arousal and control conditions, $B = -0.11$, $t(106) = -1.15$, $p > .20$.

For the generic sprinter, the Fusion × Arousal interaction was not significant, $B = 0.02$, $t(106) = 0.25$, $p > 80$. As can be seen on the right side of Figure 7, there was only a main effect of arousal, $B = -0.15$, $t(106) = -2.11$, $p < .05$, such that all participants were faster in the arousal condition than in the control condition ($M = 11.57$, $SD = 0.63$, vs. $M = 11.91$, $SD = 0.68$, respectively). Finally, the analysis revealed that none of the foregoing findings were qualified by any higher order interactions.

Did agency for the group mediate the effect of arousal on the speediness of the Spanish sprinter? Prior to conducting the meditational analysis, we examined the impact of our predictor variables on fusion-related agency. A multiple regression analysis yielded the predicted Fusion × Arousal interaction, $B = 0.31$, $t(106) = 4.03$, $p < .001$. For fused participants, arousal strongly increased fusion-related agency, $B = 1.03$, $t(106) = 9.30$, $p < .001$ ($M = 3.02$, $SD = 0.77$, vs. $M = 4.25$, $SD = 0.96$, respectively); in contrast, among nonfused participants, arousal had a weaker but still significant tendency to increase fusion-related agency, $B = 0.35$, $t(106) = 3.91$, $p < .05$ ($M = 2.50$, $SD = 1.17$, vs. $M = 3.06$, $SD = 0.73$, respectively). The Fusion × Arousal interaction qual-

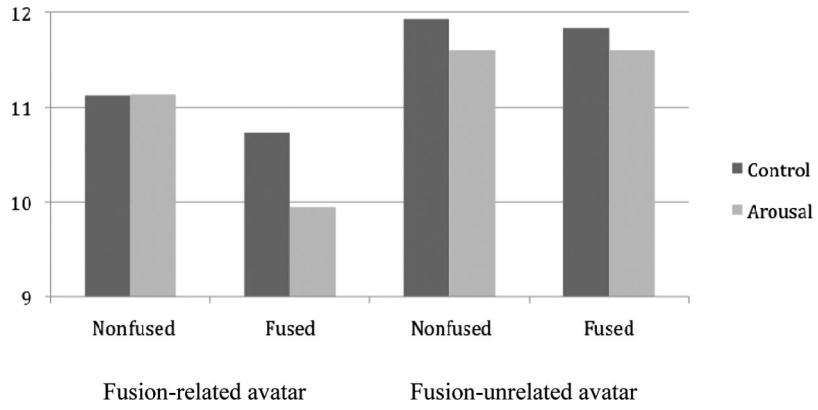

Figure 7. Experiment 4. Speed of avatar as a function of fusion and arousal.

ified a main effect of fusion, wherein fused participants showed more agency associated with the group than did nonfused participants, $B = 0.76$, $t(106) = 9.86$, $p < .001$ ($M = 3.89$, $SD = 1.07$, and $M = 2.09$, $SD = 0.54$, respectively), as well as a main effect of arousal, $B = 0.30$, $t(106) = 3.97$, $p < .001$, wherein participants in the arousal condition showed more agency associated with the group than did participants in the control condition ($M = 3.42$, $SD = 1.34$, vs. $M = 2.28$, $SD = 0.70$, respectively). No other significant effects emerged.

To test whether the interactive effect of Fusion × Arousal on the Spanish sprinter was partially mediated by fusion-related agency, we did a mediated moderation analysis. Following Preacher and Hayes (2008), we defined a mediator model in which we introduced agency as a potential mediator of the Fusion × Arousal interaction effect on the speed of the Spanish sprinter. We controlled the main effects of fusion and arousal by including them as covariates (see Figure 8). Using the SPSS macro provided by Preacher and Hayes (2008), we conducted a bootstrapping test (n boots = 5,000) for the model. Results showed that, as predicted, agency partially mediated the Fusion × Arousal interaction on the speediness of the Spanish sprinter (the 95% CI [−.1229, −.0170] referred to the product of the two paths that make up the indirect pathway).

Feelings of competitiveness. As in Experiment 3, the multiple regression analysis in which arousal, fusion, and their interaction were predictors and feelings of competitiveness were the outcome revealed no main or interactive effects, ps > .30. This finding provides additional evidence that the impact of the arousal manipulation reflected a tendency for arousal to increase feelings of competitiveness.

Discussion

As in the first three experiments, increasing the arousal of fused participants through exercise increased pro-group activity. Moreover, in this experiment, we showed that the interactive effects of fusion and arousal generalized to a measure of overt behavior that has never been examined in fusion research, motor behavior. Furthermore, once again the interactive effects of arousal and fusion were specific to the group with which participants were fused. That is, parallel to the pattern that emerged on the donation variable in Experiment 3, arousal increased the speed with which participants raced the generic (fusion-unrelated) sprinter. This finding bolstered our assumption that the arousal manipulation boosts participants' feelings of agency, whether or not they are fused with Spain. At the same time, when the Spanish (fusion-related) sprinter was being raced, arousal led to greater speed among fused participants only.

The results of Experiment 4 thus provide additional evidence of the specificity and generality of the interactive effects of fusion and arousal on pro-group behavior. In addition, the results replicate a key finding from Experiment 3: Fusion-related agency partially mediated the impact of fusion and arousal on the outcome measure. In combination with evidence that arousal increased the speed with which all participants raced the generic sprinter, it appears that the arousal manipulation increased agency of all participants. Among fused participants, such increases in feelings of agency were expressed as fusion-related agency, and the latter feelings partially mediated the impact of fusion and arousal on actions supporting the focal group.

General Discussion

Our research was designed to extend previous investigations of identity fusion (Swann et al., 2009, in press) by illuminating the mechanism that regulates the tendency of fused persons to engage in pro-group actions. We proposed that when the agency of fused persons is augmented by arousal, endorsement of pro-group ac-

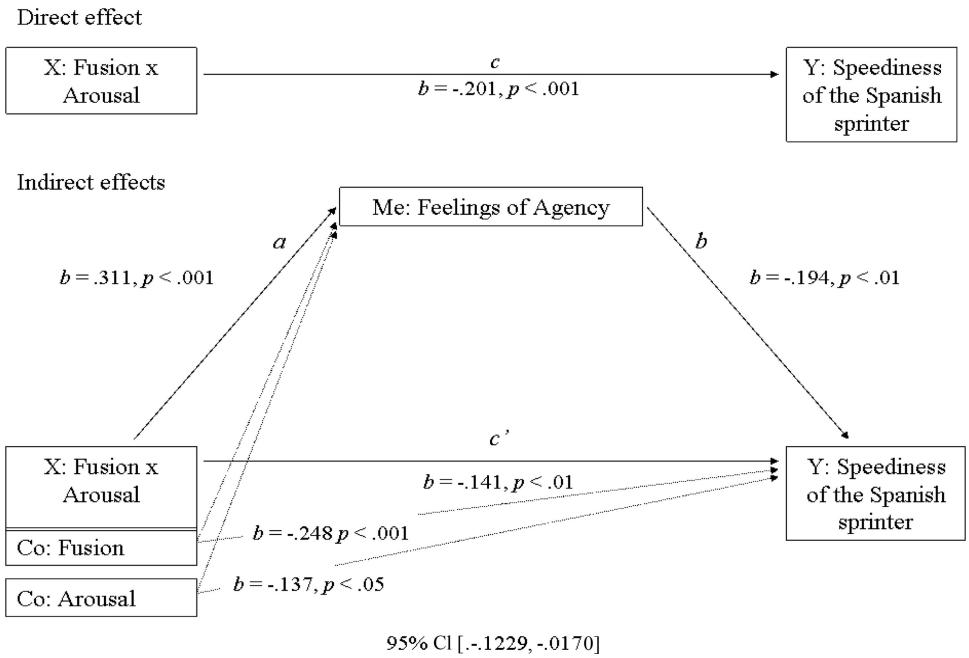

Figure 8. Experiment 4. Agency for Spain partially mediates interactive effects of Fusion × Arousal on the speediness of the Spanish sprinter. CI = confidence interval.

tions would increase. The results of four experiments supported this proposition. In particular, increasing the arousal of participants who were fused with a group increased their tendency to act on behalf of the group. Persons who were not fused with the group displayed no such tendency.

Evidence from all of our experiments offered insight into the processes underlying our effects. In all studies, for example, indices of autonomic arousal (pulse) after the arousal manipulation were associated with pro-group activity, but only for fused participants. Moreover, the results of Experiments 3 and 4 cast doubt on the notion that the arousal manipulation worked by fostering feelings of competitiveness, and they supported our assumption that arousal increased feelings of agency. That is, the arousal manipulation increased the tendency for all participants to engage in actions that were relevant to participants but not associated with the focal group (donating to a school party or increasing the speed of a generic, fusion-unrelated avatar). This finding suggests that arousal increases agency among participants whether or not they are fused. At the same time, arousal selectively increased the tendency of fused participants to engage in pro-group activities for the group with which they were fused. Finally, feelings of fusion-related agency partially mediated the interactive effects of arousal and fusion on extreme actions for the group (Experiment 3) and pro-group behavior (Experiment 4).

In addition to providing insights into the role of agency in the links between fusion and pro-group behavior, our findings provide evidence of the generality of our effects. For example, we induced arousal using a group task of dodgeball (Experiment 1) as well as individual tasks of running wind sprints (Experiment 2) and riding an Exercycle (Experiments 3 and 4). In addition, we measured three different types of pro-group activity: endorsement of the extreme actions of fighting and dying for the group, donation of personal funds to the group, and speediness of pro-group motor responses in a video game. Regardless of these variations, fusion and arousal interactively predicted pro-group activity. The evidence that our effects generalized to two distinct measures of overt behavior is especially interesting in light of the fact that previous fusion effects have been limited to behavioroid measures, as compared with overt behavioral measures. Moreover, evidence that our findings obtained on a measure of helping behavior is significant in that previous studies of fusion have focused on relatively negative behaviors such as fighting or sacrificing one's life. Our evidence that fused persons donated money to a charity linked to the focal group indicates that not only is fusion associated with actual overt behavior but that the content of those behaviors may be positive, helping behaviors toward ingroup members (Levine, Prosses, Evans, & Reicher, 2005).

The results of Experiments 2–4 provided evidence for the specificity of our effects. In particular, arousal amplified the effects of fusion only with respect to the group with which people happened to be fused. For example, fusion with Spain predicted endorsement of extreme actions for Spain but not Europe and fusion with Europe predicted endorsement of extreme actions for Europe but not Spain. No such effects emerged when we assessed the impact of arousal on the willingness of fused people to endorse or engage in pro-group behavior for a group that they were members of but not fused with.

Overall, our results offered almost no evidence that identification was a potent predictor of pro-group activity, even when a newly developed measure of identification was used (as in Preliminary Study 1). This finding is consistent with previous indications that fusion is uniquely well-designed to predict the tendency for people to individually undertake activities for groups with which they are aligned, especially extreme actions (Swann et al., 2009, in press). Of course, considerable evidence demonstrates that identification is an influential determinant of the tendency to band together with other group members and derogate members of outgroups (e.g., Branscombe, Ellemers, Spears, & Doosje, 1999; Brewer, 1999) and view fellow ingroup members through rose-colored glasses (e.g., Hewstone, Rubin, & Willis, 2002; Klar & Giladi, 1997; Voci, 2006). It thus appears that measures of fusion and identification are related but distinct measures of alignment with the group.

Some aspects of our findings owe an intellectual debt to excitation transfer theory (Zillman, 1971) and misattribution of arousal formulations (Valins & Nisbett, 1971). It could be argued, for example, that when people exercised, they became aroused, and the residual effects of this arousal augmented their later endorsement of extreme behavior. Although these findings are consistent with attributional approaches, these approaches obviously do not specify why arousal should amplify the fusion-related behaviors of fused participants but not nonfused participants, nor do they explain the mediational role of fusion-related agency among fused persons. Therefore, attributional approaches may partially explain the effects of our exercise manipulations, but our findings go beyond these approaches by demonstrating several variables that influence our outcome variables, namely, identity fusion, generic and specific feelings of agency, and fusion-related agency.

Our findings also offer some insight into the processes through which fusion leads to extreme behavior. In particular, the results of Preliminary Study 2 indicated that fusion is associated with commitment to the group, but fusion is more strongly related than commitment to endorsement of extreme actions for the group. Nevertheless, little is also known about the origins of fusion, specifically, why some people become fused with a particular group whereas others do not, as well as what factors determine why some people are fused and others are merely strongly identified with a group. A related question is the relationship of fusion and commitment to extreme behavior. We assume that commitment mediates the relationship of fusion to extreme behavior (rather than fusion mediating the relationship of commitment to extreme behavior), but the answer to this question must await a study using a longitudinal design. Another important question is the impact of context on fusion; although we believe that there is a temporally stable component to fusion, context surely influences people's feelings of fusion at any given moment.

Another unknown is why the measure of fusion routinely outperforms verbal measures of identification (for parallel findings in the domain of close relationships, see Aron et al., 1992). The key may be that when people endorse the fused option, they are acknowledging feelings of oneness and shared essence with the group. Such feelings, like the feelings of oneness that mothers have with their children, compel fused persons to do almost anything on the group's behalf. In contrast, when people endorse items on identification scales such as "My group's successes are my successes," they acknowledge shared fate with the group but stop short of asserting that they are one with the group. Because highly identified persons do not equate their own essence with the

essence of the group, they are unwilling to make the extreme sacrifices that are endorsed by fused persons.

Finally, nothing is known about how fused individuals relate to other ingroup members, particularly nonfused persons. On the one hand, our findings suggest that fused people will promote the interests of the group in several ways. Fused people may, for example, adopt situational leadership roles, working to protect the group against attacks from the outgroup or donating money or assistance to other ingroup members. Such activities may foster recognition by the ingroup, and such intragroup respect may cause fused people to redouble their efforts to achieve the goals of the group (Branscombe, Spears, Ellemers & Doojse, 2002; Spears, 2001). In extreme cases, fused people may volunteer for activities such as suicide bombings, actions that could add to the group's cache within certain quarters (Tobeña, 2009). On the other hand, it is conceivable that fused persons may translate their conviction that they contribute more to the group than do other group members into condescension toward other group members. Conceivably, fused persons may become increasingly inquisitorial over time, perhaps even appointing themselves "mindguards" whose role it is to question the degree to which other members are truly loyal to the group (e.g., Janis, 1972). This could lead to dissension or disharmony in the group and undermine intragroup dynamics. These questions are merely a sampling of the many that remain for future researchers to consider.

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