


# Threat Enhances Aggressive Inclinations Among Devoted Actors Via Increase in Their Relative Physical Formidability

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## Abstract

Devoted actors—those who share sacred values with a group with which they are fused—are particularly willing to self-sacrifice to *defend* their group or values when they are threatened. Here, we explore whether they are also prone to *aggressive inclinations* toward those who endanger their group or convictions. To that end, we examined the effect of threat and the two components of the devoted actor framework—identity fusion and sacred values—on aggressive inclinations. These inclinations were registered with a videogame that allowed participants to destroy ingroup and outgroup symbols. Two experiments indicated that devoted actors reacted to threats to their ingroup and value by increasing aggressive inclinations against the rival group. This effect was apparently mediated by the perceived physical strength of the ingroup versus foes. Results suggest that devoted actors might be more prone to self-sacrifice, but also to attack those who threaten their group or values.

## Keywords

aggressive inclinations, devoted actors, identity fusion, physical formidability, sacred values

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Ingroup bias can readily turn into intergroup hostility when group members perceive material or symbolic dangers. People may verbally express contempt toward the source of threat or demand institutional retaliation. Few individuals, however, are willing to become personally involved in aggressive actions. The current research aims to identify the processes that precipitate aggressive inclinations when one's group is in jeopardy. To that end, we scrutinized the influence of two independent predictors of self-sacrifice that interact under threatening circumstances: identity fusion and commitment to sacred values. Previous studies show that individuals who are fused with a group and consider the group's value(s) as sacred—devoted actors—are extraordinarily willing to make costly sacrifices for the group or the value perceived to be under threat (Gómez et al., 2017; Sheikh et al., 2016). Here, we propose that threatened devoted actors will exhibit aggressive inclinations against perceived foes at the expense of personal gains, and they will do so driven by a grandiose perception of physical ingroup formidability relative to the rival group. To capture aggressive inclinations, we developed a customizable videogame.

## Devoted Actors and Costly Sacrifices

The devoted actor framework integrates two well-known predictors of extreme pro-group behavior: identity fusion (Gómez

& Vázquez, 2015; Swann et al., 2009, 2012) and sacred values (Atran et al., 2007; Tetlock et al., 2000). Identity fusion is a visceral connection to a group that rests on two central components: a perception of oneness with a group and a sense of reciprocal strength that imbues fused members with a feeling of invulnerability (Gómez, Brooks, et al., 2011). Strongly fused individuals retain an agentic personal self that is subordinated to the group interests and to the welfare of its members, who are considered as family (Swann, Buhrmester, et al., 2014; Swann, Gómez, et al., 2014). Identity fusion motivates extreme sacrifices for ingroup members, especially under threatening circumstances (e.g., Gómez, Brooks, et al., 2011; Gómez, Morales, et al., 2011).

Besides social bonding, extreme sacrifices may also be inspired by a strong commitment to values that are considered

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irrevocable and non-negotiable. Sacred values operate as absolute moral imperatives independently of potential outcomes or material incentives (Atran & Ginges, 2012). They may be based on religion (e.g., Sharia law), but secular preferences as a belief or a political system (e.g., democracy) can also be sacred (Ginges et al., 2011). People often take their sacred values for granted inasmuch as such values are often part of the moral foundation, or “ultimate postulates” (Rappaport, 1999), upon which the cooperative functioning and continuity of society depends. People are more likely to become acutely aware of their foundational values and express commitment to their defense, when they perceive them to be imperiled (Atran & Axelrod, 2008; Sheikh et al., 2012).

Identity fusion and sacred values are integrated into the dual framework of the devoted actor, which provides additional understanding of behavior beyond single-factor approaches to account for extreme sacrifices either for a cause or for fellows (Gómez et al., 2017). A study conducted in two Moroccan neighborhoods associated with militant jihad (Sheikh et al., 2016) showed that those participants who were fused with a kin-like group of friends and considered Sharia as sacred were most supportive of militant jihad and most willing to sacrifice to implement Sharia. A follow-up study revealed that intergroup threat maximizes the proneness of devoted actors to assume personal costs for their sacred value. In particular, the Spaniards who were most willing to endorse extreme sacrifices for democracy were fused with friends, considered democracy sacred, and were reminded of the 2004 terrorist train bombings in Madrid. In short, pro-ingroup or pro-value behavior amplified when identity fusion and sacred values interacted under threatening circumstances.

Frontline investigations with fighters against the Islamic State and online studies with nonradical samples (Gómez et al., 2017) yielded similar conclusions. The convergence of commitment to sacred values and fusion with groups holding those values reinforced the willingness to make costly sacrifices. This suggests that devoted actors are ready to undertake personal costs on behalf of a group or a cause under threatening circumstances. This research does not reveal, however, whether devoted actors also are more likely than nondevoted actors to initiate aggressive actions against perceived enemies.

The minimal group paradigm had repeatedly found that people tend to favor ingroup members over outgroup members when it comes to allocating rewards. In contrast, when individuals are asked to administer punishments (e.g., aversive noise, boring tasks), they do not discriminate between ingroup and outgroup members except under special circumstances (for a review, see Mummendey & Otten, 1998). Likewise, additional studies relying on the Intergroup Prisoner's Dilemma—Maximizing Difference (IPD-MD) game reveal an overall reluctance to actively harm outgroup members, unless both groups are defined by their moral

preferences (e.g., pro-choice vs. pro-life groups, Weisel & Böhm, 2015). Based on this research, we conjecture that the willingness to make costly sacrifices is not equivalent to intergroup aggressive inclinations and they have a different nature. Therefore, it is necessary to conduct additional studies to check whether devoted actors are not only more willing to sacrifice themselves but also more inclined toward intergroup aggression than nondevoted actors when their group and/or values are threatened.

## Threat, Perceived Formidability, and Group-Related Aggression

Aggressive behavior can be elicited by a myriad of genetic, personal, relational, sociocultural, and situational factors (Shaver & Mikulincer, 2011). Among those factors, we are interested in the influence of threat. Different kinds of threat can fuel aggressive behavior (e.g., a threat to self-esteem in Bushman & Baumeister, 1998; a threat to one's social identity in Maass et al., 2003; a provocation in Talley & Bettencourt, 2008), but endorsement of aggressive reactions depends on the relevance of the aspect (i.e., social identity, values) that is endangered. For example, Israelis fused with Judaism appear to be more supportive of retaliatory activity against Palestinians than nonfused Israelis in response to existential threat—terrorist attacks (Fredman et al., 2017). Individuals who are emotionally invested in the belief that their group possesses unparalleled greatness (collective narcissists, Golec de Zavala et al., 2009) express intentions to harm an offending outgroup based on their perception of threat from the outgroup and insult to the ingroup. Likewise, we predict that devoted actors—for whom the group and its sacred value are extremely relevant—will respond to different kinds of threats more aggressively than nondevoted actors.

In particular, we will explore symbolic and realistic threats. According to Stephan et al. (1998), symbolic threats endanger the moral, values, and norms of the group (e.g., the replacement of the ingroup's worldview with that of the outgroup), whereas realistic threats question the very existence of the group, its political and economic power, or the material and physical well-being of its members (e.g., a terrorist attack). Both symbolic and realistic threats can be internal (coming from the ingroup) or external (posed by an outgroup).

In addition, we will examine a potential underlying factor of aggressive inclinations, namely, perceived formidability of the group versus foes. Physical formidability has been associated with bellicosity in many cross-cultural studies (e.g., Petersen & Dawes, 2017; Sell et al., 2009, 2017). When individuals have to decide in a conflict whether to flee, negotiate, or attack, they quickly assess the relative fighting capacity of the two competing parties (Durkee et al., 2018; Fessler & Holbrook, 2013). The combatants' fighting capacity depends on many attributes as relative size, strength, sex,

age, health, martial skills, access to weapons, or presence of allies among others (Fessler et al., 2012). To facilitate decision-making, all the multiple factors related to the fighting capacity are compiled into a single summary representation of formidability that encapsulates the contributions of all the determinants of the fighting capacity. Fessler et al. (2012) demonstrated that physical size and strength are the key dimensions of the cognitive representation of formidability because they are phylogenetically ancient determinants of the outcomes of violent conflicts and they are frequently reinforced during ontogeny (Fessler & Holbrook, 2013). Thus, the mental representation of foes or oneself is rendered larger or smaller, and more or less muscular, depending on a variety of cues related to the potential to inflict harm (Fessler et al., 2012).

Just as people estimate the formidability of individuals, they should be able to evaluate the relative formidability of groups as well. Durkee et al. (2018) confirmed that people automatically assess both individual and group formidability. In particular, they found that groups with greater combined formidability were perceived as stronger than groups with lesser combined formidability. Other studies have compared the formidability estimation of one's own group with the estimation of other groups (Gómez et al., 2017; Sheikh et al., 2016). Importantly to the current research, Sheikh et al. (2016) showed that estimations of group formidability may be moderated by perception of threat, identity fusion, and sacred values. Specifically, they found that participants, in general, perceived their country (Spain) as more physically formidable than an outgroup (jihadists). However, such a difference was maximized for devoted actors (fused with a kin-like group of friends and holding democracy as sacred) under threatening circumstances, that is, when they were reminded of outgroup's sacred values (strict Sharia) that clash with those of the ingroup. In the control condition, however, the estimations of formidability for devoted actors did not differ from the estimations of nondevoted actors. A similar pattern emerged for willingness to make costly sacrifices for democracy. These results are consistent with other findings indicating that devoted actors and fused persons are more reactive to threat than nondevoted or nonfused individuals (e.g., Gómez, Brooks, et al., 2011; Gómez et al., 2017; Swann et al., 2009; Vázquez et al., 2017). For instance, Gómez, Brooks, et al. (2011) found that strongly fused participants increased their feeling of ingroup invulnerability and, in turn, their willingness to fight for their group under threatening circumstances. Thus, devoted actors might perceive higher differences in formidability between the ingroup and the outgroup due to their elevated confidence in the ingroup's capacity to cope with threats and survive (Gómez, Brooks, et al., 2011).

In line with Sheikh et al. (2016), we propose that devoted actors will exhibit a heightened perception of ingroup formidability as compared to the opposing group and more aggressive inclinations when a threat to the value and to the group

is salient as compared to a control condition. Given the association between physical formidability and aggressive behavior (Petersen & Dawes, 2017; Sell et al., 2009, 2017), the elevated perception of formidability should lead devoted actors to be most likely to engage in aggressive behavior. Thus, we also expect that such aggressive inclinations of devoted actors under threat will be explained by the perceived relative formidability of the ingroup and the threatening group.

## Measure of Aggressive Inclinations

As capturing aggressive behavior in the lab poses ethical problems, most studies about aggression rely on intentions as a proxy to actual behavior. Recently, DeWall et al. (2013) developed a new method to assess aggressive inclinations across different settings and relationship contexts, the voodoo doll task. In this task, participants have the opportunity to inflict harm on a doll that represents another person by stabbing the doll with pins. Nine studies suggested that causing harm to the voodoo doll have psychological similarities to causing actual harm to the person the doll represents. In fact, the number of pins that participants inserted into the doll was associated with several self-report indicators of aggression: insulting a close relationship partner during a problem-solving task, showing higher aggressive tendencies and greater anger during a discussion task, and blasting a partner with louder and more prolonged noise during a reaction-time task. McCarthy et al. (2016) later found converging evidence for the validity of the voodoo doll task as a proxy for child-directed aggression in a sample of more than 1,000 parents.

Although this task provides a reliable and valid measure of aggressive inclinations in interpersonal relationships, there is no clear way to adapt it to an intergroup context. Given this limitation, we developed a videogame<sup>1</sup> that allows measuring differential *aggressive inclinations* toward the ingroup and the outgroup. Like the voodoo task doll, this videogame relies on attacks against symbols as a measure of aggressive inclinations; however, the symbols in this case represent a whole group instead of a single person.

Group symbols exert notorious effects on intergroup relations as indicated by real incidents and empirical research. For instance, exposure to national flags can increase nationalism (Kimmelmeier & Winter, 2008), aggressive judgments and behavior (Ferguson & Hassin, 2007), and outgroup prejudice (Becker et al., 2011), whereas exposure to the Confederate flag produces more negative judgments of Black targets (Ehrlinger et al., 2011). The desecration, disrespect, or appropriation of outgroup symbols may unleash episodes of intergroup tension or violence. For instance, in the Robber's Cave experiment (Sherif & Sherif, 1953), hostilities between the two groups of boy campers included a flag-burning incident. The visit of a former prime minister of Israel, Ariel Sharon, to the Temple Mount in Jerusalem, a

holy site for Muslims, was followed by the second *Intifada*, that caused thousands of deaths according to the United Nations Office for the Coordination of Humanitarian Affairs (2007). The satirical cartoons of Prophet Muhammad by the Charlie Hebdo magazine were perceived by the Muslim Brotherhood as an insult to their faith, caused widespread outrage and anti-Western protests in different Muslim countries in 2012, and presumably inspired the terrorist attack of 2015 against the headquarters of the magazine. Furthermore, disrespecting group symbols as flags or the national anthem may result in jail time or economic fines in several countries such as China, Germany, Greece, or Spain. Importantly, attacking group symbols not only is offensive when such actions are public. Flag desecration in private (e.g., cleansing one's toilet with it) is also perceived as disgusting and morally wrong, especially by members of low socioeconomic groups (Haidt et al., 1993).

In light of these empirical findings and historical events, the aggression against outgroup symbols appears to have remarkable consequences for intergroup relations. Thus, to capture aggressive inclinations against the outgroup in a virtual and ethically acceptable environment, we developed a videogame. This videogame was adapted from the *Astro Blaster* arcade game created by Sega. In our *Astro Blaster* game, participants pilot a spaceship that can fire at the meteorites one finds along the way as the spaceship moves through space. The goal is to obtain as many points as possible by destroying meteorites. These meteorites can be neutral (a big stone) or represent the ingroup or the outgroup by means of a symbol or a flag. Participants learn that not all meteorites provide the same amount of points. Destroying a neutral meteorite gives no points, destroying an ingroup meteorite gives 100 points, and destroying an outgroup meteorite gives 50 points. Participants can maximize their personal gains by destroying ingroup meteorites, because attacking an ingroup meteorite adds twice as many points (100 vs. 50) as destroying an outgroup meteorite. This differential assignment of points to ingroup and outgroup meteorites reveals if participants' strategies are based on considerations of their personal benefit or their group membership. Those participants who destroy more outgroup meteorites than ingroup meteorites are not moved by egoistic concerns, because they would win more points by selecting the opposite strategy (preferentially destroying ingroup meteorites).

## Overview of the Current Research

Given that the main outcome measure, aggressive inclinations, is novel, we conducted a preliminary study to obtain convergent validity. To that end, we included several scales of aggressive and hostile inclinations toward outgroup members that were already tested in previous research, and we checked whether they were correlated to our measure. We also conducted two experiments. Before playing the game,

participants reported whether they were fused with their country (Spain) and considered democracy sacred, and then, they were assigned to a control or a threat condition differing from one study to another. In Experiment 1, we presented an internal, material, and symbolic threat to the group and to the value of democracy, the anti-constitutional referendum on the secession of the region of Catalonia from Spain. The secession of this region questions the integrity of the group and implies a disruption of its current normative system. In Experiment 2, we used an external, material, and symbolic threat to the group and to democracy, the implementation of Sharia in its extreme interpretation following Sheikh et al. (2016). The implementation of strict Sharia would replace the values, customs, and norms of the ingroup and would compromise the well-being of its members.

We anticipated that for devoted actors, a threat to the country and to the value (secession in Experiment 1 and strict Sharia in Experiment 2) will amplify aggressive inclinations against the outgroup. In addition, these effects on aggressive inclinations might be explained through the perceived physical strength of the ingroup versus foes.

In Experiment 2, we also tested whether aggressive inclinations are equivalent to the traditional outcome measure of the devoted actor model, namely, willingness to make costly sacrifices for the group or the value. We predicted that aggressive inclinations and costly sacrifices will be independent (i.e., their association will be low), although both outcomes will be amplified for devoted actors under threat.

We report all measures, manipulations, and exclusions in the "Method" sections. We did not determine sample size a priori. All studies were open for a week and then closed definitely. No additional data were collected after an initial data analysis.

## Preliminary Study

We first conducted a preliminary study to check whether the results of the videogame correlate with measures of hostility and aggressive inclinations toward outgroup members. To that end, we focused on the current conflict between Spain and pro-independence Catalans (a region of Spain). This conflict had its climax on October 2017, when the Catalan government declared independence from Spain, which was prohibited by the Spanish constitution. After a long trial, the Catalan political leaders involved in the declaration were sentenced to prison. The Catalan population is divided in half regarding their preferences for independence or unity with Spain.

## Method

**Participants.** A total of 204 Spaniards participated online (57.1% female,  $M_{\text{age}} = 37.67$  years,  $SD = 14.92$  years). In all studies, we recruited them using the snowball technique wherein Psychology undergraduates asked their

acquaintances to participate. They participated on voluntary basis and did not receive monetary compensation. Catalan participants were diverted to a different study.

**Procedure.** Participants were invited to collaborate in a study about intergroup relations. We first measured *aggressive inclinations* by means of our Astro Blaster videogame. Participants learned that they could maximize their personal gains by destroying ingroup meteorites, because attacking an ingroup meteorite adds twice as many points (100 vs. 50) as destroying an outgroup meteorite. The maximum number of meteorites from each group that could be destroyed is 12 during 60 s. Therefore, the maximum score that could be obtained (if all meteorites were destroyed) is 1,800 points, whereas the minimum (if no meteorite is destroyed) is 0 points. In all studies, we operationalized *aggressive inclinations* as the number of outgroup meteorites that participants destroy minus the number of meteorites representing the ingroup. Accordingly, a positive score indicates that participants destroy more outgroup meteorites than ingroup meteorites, whereas a negative score indicates that participants destroy more ingroup meteorites than outgroup meteorites. In the preliminary study, the ingroup (Spain) was represented by the Spanish flag, whereas the outgroup (pro-secession Catalans) was represented by a yellow tie (a symbol widely used by independence supporters and known by both groups).

Then, we included alternative measures that are theoretically related to aggressive inclinations. All scales ranged from 0 (*strongly disagree*) to 6 (*strongly agree*).

To assess *willingness to fight against outgroup members to defend ingroup members*, we adapted the five-item scale of Swann et al. (2009) measuring willingness to fight for the group. In particular, we included items as “I would fight any pro-secession Catalan physically threatening another Spaniard” or “I would fight any pro-secession Catalan insulting or making fun of Spain,”  $\alpha = .88$ .

We also assessed to what extent participants support *institutional aggression in conflict* by means of eight items. Four items were adapted from Golec de Zavala et al. (2010) “To demonstrate police strength to intimidate them/ to humiliate them and disregard them/to openly attack them/to reject all their proposals.” Four additional items were created specifically to the current context: “To imprison protesters/to suspend autonomy (apply article 155) indefinitely/to outlaw pro-secession parties and organizations/to reduce funding for Catalonia until they leave the independence project.” A factor analysis with Oblimin rotation yielded a single factor with loadings ranging from .70 to .87,  $\alpha = .93$ .

*Hostility toward outgroup members* was measured by means of three items adapted from Schaafsma and Williams (2012). Participants had to indicate to what extent they felt anger/aggressive/hate when they thought about pro-secession Catalans,  $\alpha = .91$ .

Finally, we asked participants to what extent they would desire to *punish outgroup members*.

**Table 1.** Preliminary Study: Descriptive Statistics and Correlations.

Variable	M	SD	1	2	3	4
1. Aggressive inclinations	1.77	4.99				
2. Fight	1.52	1.64	.30			
3. Support	1.90	1.84	.40	.68		
4. Emotion	1.31	1.63	.35	.66	.71	
5. Punishment	1.36	1.72	.38	.73	.82	.72

Note. All correlations were significant,  $p < .01$ .

## Results

Table 1 shows the correlations between our measure of aggressive inclinations and the remainder scales. Our index correlated positively with all of them.

## Discussion

The preliminary study provides convergent validity for our measure of aggressive inclinations. Our index was positively related to other instruments tapping hostile orientations toward outgroup members such as willingness to fight against outgroup members to defend ingroup members, support for institutional aggression, negative emotions, and desire for punishment. Once we have verified the relationship of our measure with other theoretically related scales, we present two experiments.

## Experiment 1

In Experiment 1, we checked whether identity fusion and sacred values interactively moderate the impact of threat on relative formidability and aggressive inclinations. To that end, we asked a group of participants to reflect on how an anti-constitutional referendum for independence celebrated in Catalonia (one of the richest regions of Spain) in 2017 affected democracy and their country. We expected an interaction between fusion, sacred values, and salience of threat, such that relative formidability and aggressive inclinations would increase in the threat condition only for devoted actors (fused with country and holding democracy as sacred). We also predicted that relative formidability would mediate this interactive effect on aggressive inclinations.

## Method

**Participants.** One thousand six hundred and forty-two Spaniards (57.3% female,  $M_{\text{age}} = 34.13$  years,  $SD = 11.60$  years), recruited as in the preliminary study, participated in an online experiment.

**Procedure.** Participants were invited to collaborate in a study about intergroup relations. Participants first reported their level of fusion with Spain by completing the Dynamic

Index of Identity Fusion (DIFI; Jiménez et al., 2015). This index includes two circles of different size representing the self (the small circle) and the group (the big circle). Participants were asked to drag the small circle to the position that best represented their relationship with their country. Those participants who completely introduced the small circle (self) into the big circle (country) were categorized as fused. Those participants for whom overlapping was partial, or who presented no full overlapping between the circles, were categorized as nonfused. Then, we assessed whether participants perceived democracy as a sacred value. To that end, we asked participants how much money would be necessary for them to say publicly that they would renounce democracy (Gómez et al., 2017; Sheikh et al., 2016). Participants who responded that they would never renounce democracy, no matter how much money they would receive, were categorized as holding sacred values (19.36% had sacred values). Those participants who selected any other option (accepting different quantities of money: €0, €100, €1,000, €10,000, €100,000, and €1 million) were categorized as not holding sacred values; 40.68% of the participants were fused, 20.52% had sacred values, and 11.39% were devoted actors.

Next, participants were assigned to a threat or control condition. Participants in the *threat condition* were asked to describe how an anti-constitutional referendum for independence celebrated in Catalonia affected democracy and their country. Participants in the *control condition* described how they had known the study. Then, they completed the measures of formidability and aggressive inclinations (Spanish vs. pro-secession Catalans).

*Ingroup* and *outgroup formidability* were measured by means of a dynamic measure built in HTML and JavaScript (Gómez et al., 2017). This measure was adapted from a previous six-item pictorial measure used by Fessler and colleagues (Fessler et al., 2012). This dynamic measure shows two human bodies representing the ingroup and the outgroup and varying conjointly and proportionally in size and muscularity. Scores ranged between 0 and 10. As we were interested in the intergroup comparison, we subtracted the perception of outgroup formidability from the perception of ingroup formidability to obtain *relative formidability*, which represents an indicator of the perceived physical strength of the ingroup versus foes. A positive sign would then indicate that participants perceived the ingroup as stronger than the outgroup, whereas a negative sign would imply that they perceive the outgroup as stronger than the ingroup. For the sake of brevity, we refer to the threatening group as the “outgroup” although this is not strictly accurate. (We elaborate in the discussion.) In Experiment 1, the outgroup referred to pro-secession Catalans.

To measure *aggressive inclinations*, we asked participants to play our Astro Blaster videogame as in the preliminary study.

## Results

Table 2 comprises the means and standard deviations per condition for Experiments 1 and 2, whereas Table 3 includes the correlations among fusion, sacred values, and the dependent variables.

To test the effect of the experimental manipulation, sacred value, and fusion on the outcome measures, relative formidability, and aggressive inclinations, we conducted two linear regression analyses. Condition (0 control, 1 threat), sacred value (0 nonsacred, 1 sacred), fusion (0 nonfused, 1 fused), and the two-way and the three-way interactions were included as predictors.

**Relative formidability.** As expected, the regression on relative formidability yielded a significant effect of the three-way interaction between sacred values, fusion, and condition (see Figure 1 and Table 4). Decomposition of this interaction showed that condition only had a significant effect for devoted actors and for those who were not fused, but held democracy sacred. Devoted actors showed more pro-ingroup bias with respect to formidability in the threat condition compared to the control condition. However, those who were not fused but considered democracy sacred showed less pro-ingroup bias in the threat condition compared to the control condition. The effects of fusion and the interaction between value and condition were also significant.

**Aggressive inclinations.** The regression on aggressive inclinations yielded a significant effect of the three-way interaction between sacred values, fusion, and condition. Decomposition of this interaction showed that condition only had a significant effect for devoted actors and for those who were not fused and did not hold democracy as sacred (see Table 5). Devoted actors showed more aggressive inclinations against pro-secession Catalans in the threat condition than in the control condition. The effect was reversed for those who were not fused and did not hold democracy sacred and who diminished aggressive inclinations in the threat condition compared to the control condition. The effect of fusion and condition was also significant.

**Indirect effects.** To test whether relative formidability mediates the interactive effect between fusion, value, and condition on aggressive inclinations, we conducted a bootstrapping test (5,000 boots, Model 12) with PROCESS (Hayes, 2017). The overall index of mediation was significant, 1.19, 95% confidence interval (CI): [0.679, 1.804]. The indirect effects of condition via relative formidability on aggressive inclinations were significant only for devoted actors,  $B = 0.63$ , 95% CI: [0.39, 0.93], and for those who considered democracy sacred but were not fused,  $B = -0.42$ , 95% CI: [-0.80, -0.05] (see Supplementary materials).

**Table 2.** Experiments 1 and 2: N, Means, and Standard Deviations Per Condition.

Experiment	Condition	Sacred value	Fusion	N	Relative formidability		Aggressive inclinations		Sacrifices democracy		Sacrifices country		
1	Control	No SV	Nonfused	385	5.05	5.04	0.56	4.68					
			Fused	261	6.17	4.53	2.24	4.75					
		SV	Nonfused	77	5.31	4.72	-0.31	4.86					
			Fused	73	6.52	4.02	1.60	5.30					
	Threat	No SV	Nonfused	394	5.21	4.56	-0.10	4.55					
			Fused	265	5.75	4.69	2.15	4.80					
		SV	Nonfused	118	3.56	5.69	0.52	5.27					
			Fused	69	9.16	1.37	7.48	1.82					
2	Control	No SV	Nonfused	145	1.62	5.22	0.81	4.25	1.12	1.05	0.70	0.90	
			Fused	83	2.43	5.06	1.95	4.47	0.97	1.19	1.01	1.09	
		SV	Nonfused	39	2.03	5.13	1.64	4.70	0.72	0.95	0.59	0.92	
			Fused	27	2.37	5.68	1.41	5.01	0.70	1.01	1.36	1.31	
		Threat	No SV	Nonfused	156	2.29	5.41	1.70	4.70	1.17	1.23	0.83	1.16
				Fused	81	2.89	5.52	2.15	4.65	1.09	1.23	1.25	1.44
	SV		Nonfused	43	1.93	6.36	2.07	4.73	0.97	1.00	0.63	0.89	
			Fused	30	8.70	2.37	5.70	2.74	2.24	1.64	2.60	1.55	

Note. SV = sacred values.

**Table 3.** Experiments 1 and 2: Correlations Between Predictors and Dependent Variables.

Experiment	Variable	1	2	3	4	5
Experiment 1	1. SV					
	2. Fusion	.01				
	3. Relative formidability	.02	.14**			
	4. Aggressive inclinations	.08**	.24**	.28**		
Experiment 2	1. SV					
	2. Fusion	.05				
	3. Relative formidability	.10*	.13**			
	4. Aggressive inclinations	.10*	.11**	.17**		
	5. Sacrifices democracy	.01	.03	.10*	.04	
	6. Sacrifices country	.10*	.25**	.10*	.14**	.66**

Note. SV = sacred values.

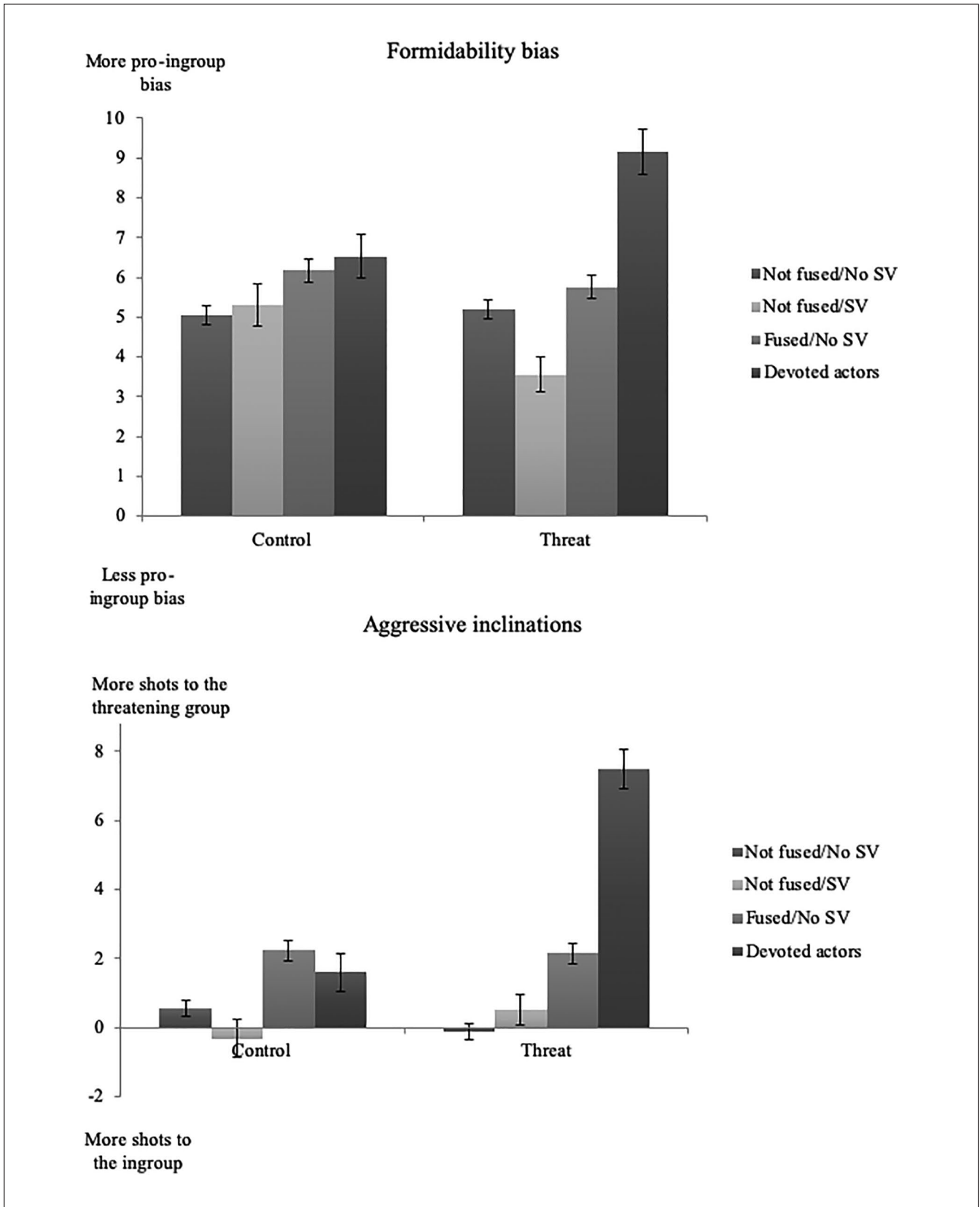
\* $p < .05$ . \*\* $p < .01$ .

**Sensitivity power analysis.** We conducted a sensitivity power analysis assuming an alpha significance criterion of .05. Considering a sample size of 1,642 participants and nine predictors (sacred value, fusion, condition, the three two-way interactions, the three-way interaction, age, and gender), we could detect a minimum effect size of  $f^2 = .010$  with 80% power.

**Discussion**

As expected, condition, sacred values, and fusion interacted to increase relative formidability and aggressive inclinations. In particular, reflecting on the impact of secessionism for the sacred value (democracy) and the country (Spain)-led devoted actors to maximize the relative formidability of their group and, in turn, exhibit more aggressive inclinations

against pro-secession Catalans as compared to the control condition. Those participants who held sacred values but were not fused perceived higher outgroup formidability under threat as compared to the control condition. Those who were not fused and neither held sacred values showed less aggressive inclinations under threat as compared to the control condition. In this study, we focused on a threat generated within the group. In Experiment 2, we tested whether these effects are replicated when a threat coming from an outgroup is made salient. To obtain converging evidence with preceding research on devoted actors and, at the same time, show that aggressive inclinations are different from the outcomes previously explored by that approach, we also added the traditional dependent variable of the devoted actor framework, the willingness to make costly sacrifices to defend the group or the value.



**Figure 1.** Experiment 1. Formidability bias (ingroup formidability minus outgroup formidability) and aggressive inclinations (threatening group shots minus ingroup shots) as a function of condition, sacred values (SV), and identity fusion.



**Table 4.** Experiment 1: Regression on Formidability Bias.

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	LLCI	ULCI
Constant	5.05	0.24	21.18	.000	4.586	5.523
Condition	0.15	0.34	0.45	.653	-0.507	0.809
Values	0.26	0.58	0.44	.660	-0.890	1.404
Condition × Value	-1.90	0.76	-2.49	.013	-3.401	-0.405
Fusion	1.12	0.38	2.98	.003	0.381	1.854
Condition × Fusion	-0.57	0.53	-1.08	.282	-1.606	0.468
Value × Fusion	0.09	0.85	0.11	.915	-1.581	1.763
Condition × Value × Fusion	4.96	1.17	4.24	.000	2.665	7.254
Simple slopes:						
No SV—no fusion	0.15	0.34	0.45	.653	-0.507	0.809
No SV—fusion	-0.42	0.41	-1.02	.307	-1.219	0.383
SV—no fusion	-1.75	0.69	-2.55	.011	-3.098	-0.407
SV—fusion	2.64	0.79	3.36	.001	1.096	4.181

Note. LLCI = lower level confidence interval; ULCI = upper level confidence interval; SV = sacred values.

**Table 5.** Experiment 1: Regression on Aggressive Inclinations.

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	LLCI	ULCI
Constant	0.56	0.24	2.34	.019	0.091	1.026
Condition	-0.66	0.34	-1.98	.048	-1.320	-0.005
Values	-0.87	0.58	-1.49	.137	-2.016	0.276
Condition × Value	1.49	0.76	1.95	.051	-0.006	2.988
Fusion	1.68	0.38	4.49	.000	0.947	2.419
Condition × Fusion	0.58	0.53	1.09	.276	-0.460	1.612
Value × Fusion	0.23	0.85	0.27	.786	-1.439	1.902
Condition × Value × Fusion	4.47	1.17	3.82	.000	2.178	6.764
Simple slopes:						
No SV—No fusion	-0.66	0.34	-1.98	.048	-1.320	-0.005
No SV—Fusion	-0.09	0.41	-0.21	.832	-0.887	0.714
SV—No fusion	0.83	0.69	1.21	.227	-0.516	2.173
SV—Fusion	5.88	0.79	7.48	.000	4.334	7.417

Note. LLCI = lower level confidence interval; ULCI = upper level confidence interval; SV = sacred values.

## Experiment 2

In Experiment 2, we sought to replicate the results of Experiment 1 with a different threat to the group and to the value: a strict interpretation of Sharia. As in the previous study, we expected an interaction between fusion, sacred values, and salience of threat, such that relative formidability and aggressive inclinations would increase in the threat condition only for devoted actors. Relative formidability should mediate this interactive effect on aggressive inclinations. In addition, to test that aggressive inclinations are not equivalent to the traditional outcome measure of the devoted actor framework, we measured participants' willingness to make costly sacrifices for their country and for democracy. We predicted a weak correlation between the two measures of costly sacrifices and aggressive inclinations. Nonetheless, the pattern of results regarding costly sacrifices should be similar to aggressive inclinations. In

particular, we also expected a triple interaction between fusion, sacred values, and salience of threat, such that devoted actors in the threat condition would show the greatest willingness to make costly sacrifices.

## Method

**Participants.** Six hundred and four Spaniards (60.8% female,  $M_{age} = 34.41$  years,  $SD = 11.56$  years), recruited as in the preliminary study, participated in an online experiment.

**Procedure.** We first measured fusion with country and democracy as a sacred value, as in the previous study (36.59% fused, 23.01% with sacred values, and 12.09% devoted actors). Next, participants were assigned to a threat or control condition. Participants in the *threat condition* read a description of what Sharia is and what a strict interpretation of Sharia would imply. Then, they were

asked to describe how strict Sharia would affect their country and their value. Participants in the *control condition* described how they had known about the study. Then, they completed the same measures of formidability and aggressive inclinations (Spaniards vs. Muslims) as in Experiment 1. In this case, Muslims were represented by a flag portraying a star and a crescent moon.

*Willingness to make costly sacrifices for democracy and for the country* was assessed by means of two scales with five statements: "If necessary, I would be willing to lose my job or source of income/go to jail/use violence/let my children suffer physical punishment/die to defend democracy/Spain." These items were measured on a seven-point Likert-type scale ranging from 0 (*strongly disagree*) to 6 (*strongly agree*),  $\alpha_s = .84$  and  $.88$  for democracy and country, respectively.

## Results

To test the effect of the experimental manipulation, sacred value, and fusion on the outcome measures, relative formidability, aggressive inclinations, and sacrifices for democracy and for the country, we conducted four linear regression analyses. Condition (0 control, 1 threat), sacred value (0 nonsacred, 1 sacred), fusion (0 nonfused, 1 fused), and the two-way and the three-way interactions were included as predictors.

*Relative formidability.* As expected, the regression on relative formidability yielded a significant effect of the three-way interaction between sacred values, fusion, and condition. Decomposition of this interaction showed that condition only had a significant effect for devoted actors (see Figure 2 and Table 6). Devoted actors showed more pro-ingroup relative formidability in the threat condition as compared to the control condition. No other effects were significant.

*Aggressive inclinations.* The regression on aggressive inclinations yielded a significant effect of the three-way interaction between sacred values, fusion, and condition. Decomposition of this interaction showed that condition only had a significant effect for devoted actors (see Table 7). Devoted actors showed more aggressive inclinations against Muslims in the threat condition as compared to the control condition. No other effects were significant.

*Sacrifices for democracy.* The regression on sacrifices for democracy yielded a significant effect of the three-way interaction between sacred values, fusion, and condition. Decomposition of this interaction showed that condition only had a significant effect for devoted actors (see Table 8). Devoted actors were more willing to sacrifice for democracy in the threat condition as compared to the control condition. No other effects were significant.

*Sacrifices for the country.* The regression on sacrifices for country yielded a significant effect of the three-way interaction between sacred values, fusion, and condition. Decomposition of this interaction showed that condition only had a significant effect for devoted actors (see Table 9). Devoted actors were more willing to sacrifice for their country in the threat condition as compared to the control condition. The effect of fusion was also significant.

*Indirect effects.* To test whether relative formidability mediated the interactive effect between fusion, value, and condition on aggressive inclinations, we conducted a bootstrapping test (5,000 boots, Model 12) with PROCESS (Hayes, 2017). The overall index of mediation was significant, 0.70, 95% CI: [0.15, 1.45]. The indirect effect of condition via relative formidability on aggressive inclinations was significant only for devoted actors,  $B = 0.66$ , 95% CI: [0.19, 1.25], but not for the rest of participants (see Supplementary materials).

Although no more indirect effects were hypothesized, we repeated the same mediational analysis on sacrifices for democracy and for the country. None of the indirect effects were significant,  $B = 0.03$ , 95% CI: [-0.078, 0.174], and  $B = -0.04$ , 95% CI: [-0.197, 0.078], for sacrifices for democracy and for the country, respectively.

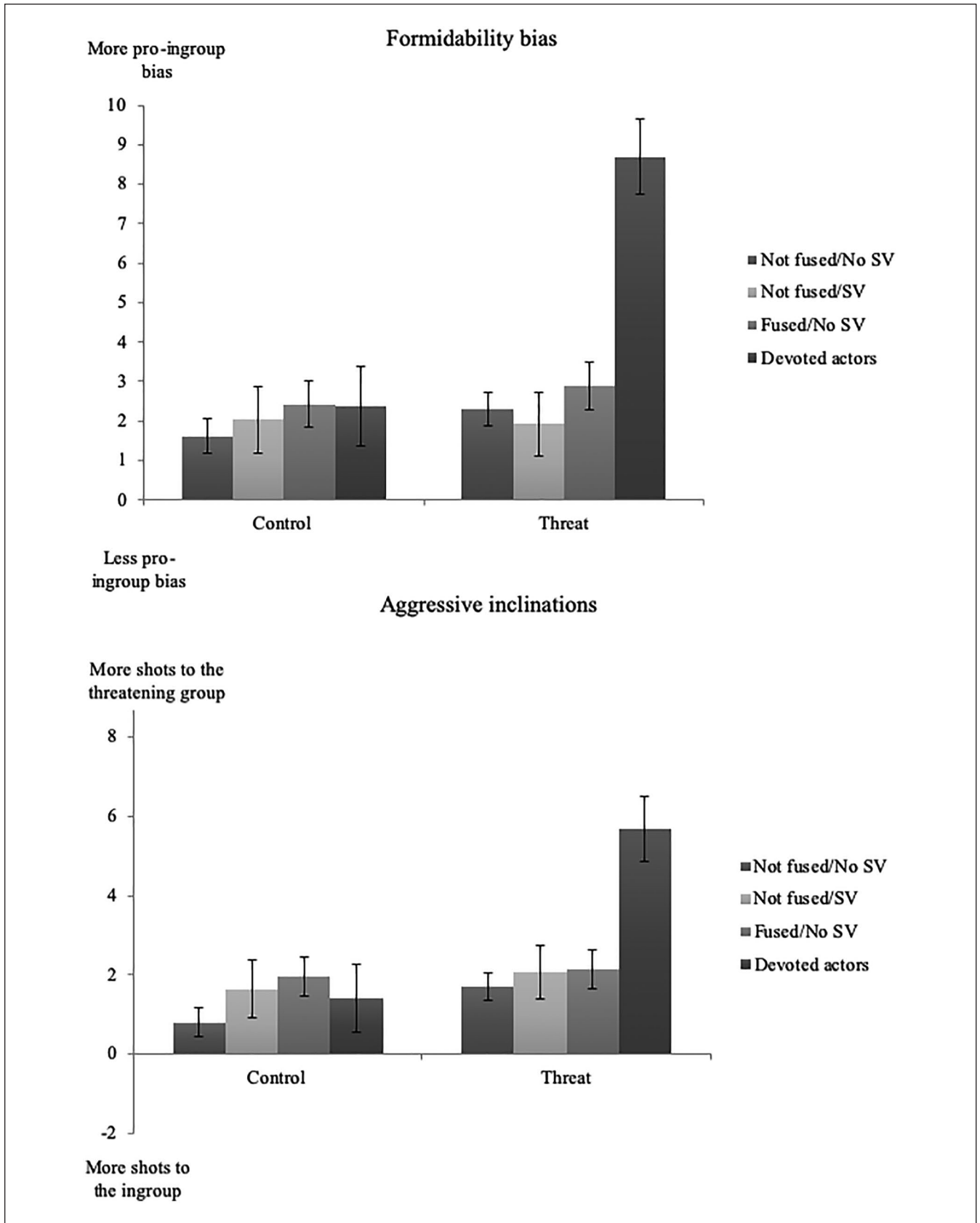
*Sensitivity power analysis.* We conducted a sensitivity power analysis assuming an alpha significance criterion of .05. With a sample size of 604 participants and nine predictors (sacred value, fusion, condition, the three two-way interactions, the three-way interaction, age and gender), we could detect a minimum effect size of  $f^2 = .026$  with 80% power.

## Discussion

As anticipated, condition, sacred values, and fusion interacted to increase relative formidability, aggressive inclinations, and costly sacrifices for democracy and for the country. In particular, reflecting on the impact of the strict interpretation of Sharia led devoted actors to increase relative formidability in favor of their country, exhibit more aggressive inclinations, and express a higher willingness to make costly sacrifices to defend democracy and their country as compared to the control condition. Once more, increased relative formidability in favor of the ingroup apparently mediated the interactive effect on aggressive inclinations. By contrast, relative formidability did not explain the effects on costly sacrifices.

## General Discussion

Devoted actors are highly disposed to sacrifice themselves to protect their group or their sacred values from a perceived threat (Gómez et al., 2017; Sheikh et al., 2016). In two experiments, we consistently found that devoted actors also



**Figure 2.** Experiment 2. Aggressive inclinations (threatening group shots minus ingroup shots) as a function of condition, sacred values (SV), and identity fusion.

**Table 6.** Experiment 2: Regression on Formidability Bias.

Predictor	B	SE	t	p	LLCI	ULCI
Constant	1.62	0.44	3.69	.000	0.757	2.484
Condition	0.67	0.61	1.10	.270	-0.525	1.874
Values	0.41	0.95	0.42	.672	-1.470	2.280
Condition × Value	-0.77	1.32	-0.58	.560	-3.363	1.823
Fusion	0.81	0.73	1.12	.265	-0.618	2.244
Condition × Fusion	-0.22	1.03	-0.21	.831	-2.238	1.800
Value × Fusion	-0.47	1.51	-0.31	.757	-3.439	2.502
Condition × Value × Fusion	6.64	2.09	3.17	.002	2.525	10.763
Simple slopes:						
No SV—No fusion	0.67	0.61	1.10	.270	-0.525	1.873
No SV—fusion	0.46	0.83	0.55	.582	-1.169	2.079
SV—no fusion	-0.10	1.17	-0.08	.935	-2.395	2.204
SV—fusion	6.33	1.41	4.51	.000	3.572	9.088

Note. LLCI = lower level confidence interval; ULCI = upper level confidence interval; SV = sacred value.

**Table 7.** Experiment 2. Regression on Aggressive Inclinations.

Predictor	B	SE	t	p	LLCI	ULCI
Constant	0.81	0.37	2.16	.031	0.074	1.540
Condition	0.89	0.52	1.72	.086	-0.126	1.910
Values	0.83	0.81	1.03	.304	-0.758	2.426
Condition × Value	-0.46	1.12	-0.41	.680	-2.664	1.738
Fusion	1.15	0.62	1.85	.065	-0.070	2.360
Condition × Fusion	-0.70	0.87	-0.80	.426	-2.409	1.018
Value × Fusion	-1.38	1.28	-1.07	.283	-3.900	1.143
Condition × Value × Fusion	4.56	1.78	2.56	.011	1.063	8.056
Simple slopes:						
No SV—no fusion	0.89	0.52	1.72	.086	-0.126	1.910
No SV—fusion	0.20	0.70	0.28	.780	-1.182	1.575
SV—no fusion	0.43	0.99	0.43	.666	-1.523	2.380
SV—fusion	4.29	1.19	3.60	.000	1.951	6.634

Note. LLCI = lower level confidence interval; ULCI = upper level confidence interval; SV = sacred value.

express willingness to engage in aggressive behavior against perceived foes even at the expense of personal gains when they feel threatened. Those participants who were fused with their group (Spain), considered their value (democracy) sacred, and were reminded of a collective threat destroyed more outgroup meteorites than ingroup meteorites, although this decision diminished personal gains. Significantly, these effects were apparently mediated by the perception that the ingroup is more formidable than the rival group. Devoted actors attributed more formidability to the ingroup than to enemies and, in turn, engaged in more aggressive behavior. Of course, this evidence should be interpreted cautiously until future longitudinal studies test these proposed causal paths.

As in previous research (e.g., Sheikh et al., 2016), devoted actors remarkably amplified their willingness to make costly, personal sacrifices to defend democracy and their country when they reflected on how the strict interpretation of Sharia

could affect their value and their group. Unlike aggressive inclinations, the effect of threat on devoted actors' willingness to sacrifice was not mediated by relative formidability. This is not surprising inasmuch as the measure of costly sacrifices captures a general predisposition to defend the group or the value and is independent of the intergroup context. The weak association between aggressive inclinations and willingness to engage in costly sacrifices suggests that these outcomes are of different nature. Future research, then, might examine other potential mediators of the effect on intergroup aggressive inclinations besides relative formidability. The mechanisms found to mediate the effect of fusion on pro-group behavior (see Gómez, Brooks, et al., 2011; Swann, Gómez, et al., 2014) probably do not explain intergroup orientations, as they are exclusively focused on intragroup processes (e.g., familial ties with other ingroup members). Thus, the potential mediators of intergroup aggressive inclinations should be referred to the outgroup,

**Table 8.** Experiment 2. Regression on Sacrifices for Democracy.

Predictor	B	SE	t	p	LLCI	ULCI
Constant	1.12	0.10	11.58	.000	0.932	1.313
Condition	0.04	0.13	0.33	.745	-0.221	0.308
Values	-0.40	0.21	-1.90	.058	-0.813	0.014
Condition × Value	0.20	0.29	0.70	.482	-0.367	0.777
Fusion	-0.15	0.16	-0.94	.346	-0.467	0.164
Condition × Fusion	0.08	0.23	0.34	.736	-0.370	0.522
Value × Fusion	1.12	0.33	0.37	.708	-0.530	0.780
Condition × Value × Fusion	1.22	0.46	2.63	.001	0.310	2.127
Simple slopes:						
No SV—no fusion	0.04	0.13	0.33	.745	-0.221	0.308
No SV—fusion	0.12	0.18	0.66	.510	-0.238	0.479
SV—no fusion	0.25	0.26	0.96	.335	-0.258	0.756
SV—fusion	1.54	0.31	4.98	.000	0.935	2.152

Note. LLCI = lower level confidence interval; ULCI = upper level confidence interval; SV = sacred value.

**Table 9.** Experiment 2. Regression on Sacrifices for Country.

Predictor	B	SE	t	p	LLCI	ULCI
Constant	0.70	0.09	7.41	.000	0.515	0.886
Condition	0.13	0.13	1.01	.313	-0.125	0.390
Values	-0.11	0.21	-0.52	.606	-0.509	0.297
Condition × Value	-0.10	0.29	-0.35	.726	-0.657	0.458
Fusion	0.31	0.16	1.97	.049	0.001	0.617
Condition × Fusion	0.11	0.22	0.50	.620	-0.324	0.544
Value × Fusion	0.46	0.33	1.41	.158	-0.179	1.098
Condition × Value × Fusion	1.09	0.45	2.43	.016	0.209	1.980
Simple slopes:						
No SV—no fusion	0.13	0.13	1.01	.313	-0.125	0.390
No SV—fusion	0.24	0.18	1.36	.173	-0.107	0.591
SV—no fusion	0.03	0.25	0.13	.900	-0.461	0.527
SV—fusion	1.24	0.30	4.10	.000	0.644	1.830

Note. LLCI = lower level confidence interval; ULCI = upper level confidence interval; SV = sacred value.

or to a comparison between the ingroup and the outgroup (e.g., intergroup anger).

To capture intergroup aggressive inclinations, we developed a videogame that can be customized by changing the symbols representing each group. This videogame is similar to other methods as the voodoo doll task (DeWall et al., 2013) in that it assumes that people transfer characteristics of a group onto the symbol that represents that group. However, our videogame has the additional advantage that it is adaptable to an intergroup context. In the present research, we used two different threatening groups (Muslims and pro-secession Catalans). It should be noted that results were consistent although we presented diverse threats and groups. In addition, our measure correlates with different verbal scales capturing aggressive inclinations such as willingness to fight outgroup members, support for institutional aggression, desire for punishment, and hostile emotions.

Our decision to refer to internal enemies (pro-secession Catalans) as the outgroup could be criticized on the basis of common membership. Secessionists are strictly part of the group (Spain) from an external perspective. However, they diverge markedly from expected group norms in that they put the value or the group at risk by seemingly illegitimate means. People usually react to such divergence from the norm by rejecting or excluding those who do so from the ingroup (Eidelman et al., 2006; Jetten & Hornsey, 2014). The consistency of our findings regardless of the source of threat indicates that people treat ingroup members who diverge from expected norms and outgroups in similar ways.

Our findings suggest that the devoted actor framework (Atran, 2016; Atran et al., 2014; Gómez et al., 2017) can contribute to the comprehension of complex phenomena as intragroup and intergroup violence and terrorism. Our findings are novel in that they reveal that identity fusion and sacred values not only predispose individuals to sacrifice

themselves for the group or the value (e.g., Gómez et al., 2017) but also to engage in aggressive actions against perceived foes even at the expense of immediate personal costs. Apparently, they do so encouraged by a grandiose perception of ingroup physical formidability, a factor that is commonly associated with anger (Sell et al., 2009) and aggression (Fessler et al., 2012). Thus, identity fusion and sacred values could be added to the set of factors that modulate the perception of formidability (e.g., Fessler & Holbrook, 2013, 2014).

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### Supplemental Material

Supplemental material is available online with this article.

### Note

1. The instructions and code in JavaScript of the videogame, materials, and data are available at: [https://osf.io/7xnpu/?view\\_only=e14341ac52cd4839bf981bcc16020434](https://osf.io/7xnpu/?view_only=e14341ac52cd4839bf981bcc16020434)

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