

## RESEARCH ARTICLE

# The Sociofunctional Model of Prejudice: Questioning the Role of Emotions in the Threat-Behavior Link

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The sociofunctional model of prejudice (Cottrell & Neuberg, 2005) states that behaviors toward an outgroup are determined by emotions felt toward this outgroup, and that those emotions are determined by threats this group represents for one's own group. Although widely cited in literature, this intuitively appealing model is not as supported as sometimes assumed. In fact, seminal data supporting the model have not been replicated, and the mediating role of emotions in the threat-behavior link remains in need of empirical evidence. Two studies were aimed at filling this gap by measuring specific threats, emotions and their associated behavioral intentions. Our results provide mixed support for the sociofunctional model. We found evidence of the threat-emotion, the threat-behavior and the emotion-behavior links described in this model, but only partial support for the mediational role of emotion in the threat-behavior link.

**Keywords:** prejudice; emotions; threats; intergroup relations; replication

Prejudice has traditionally been defined as a general negative attitude toward outgroups (Allport, 1954). However, in previous decades, this view has been criticized for its inability to capture the diversity of (negative) feelings observed toward different groups (e.g., Cottrell & Neuberg, 2005; Mackie & Smith, 2003; Smith, 1993). Among these theoretical proposals, the sociofunctional model of prejudice (Cottrell & Neuberg, 2005) provides a fine-grained analysis of prejudice, with the aim of explaining a large diversity of feelings and behaviors toward social groups. Based on an evolutionary approach, this model suggests that prejudice should be better described as a set of specific emotions elicited by perceived threats posed by other groups. Ingroup feelings toward outgroups would be functional reactions to qualitatively different threats associated with the outgroup. Rather than a global negative feeling emerging from a unique global threat, feelings toward outgroups would be more nuanced and determined by the specific threat the outgroup represent for ingroup in the situation. Considering prejudice as a global negative feeling would thus mask the variety of emotions felt toward outgroups (e.g., anger, fear, disgust, pity, guilt), and thus obscure the prejudice-behavior link.

The sociofunctional model identifies a set of five fundamental intergroup threats and connects each of them to a primary functional emotional reaction and its prototypic behavioral motivation. However, although widely cited in literature, this intuitively appealing model is not as supported as it is sometimes assumed. Seminal data

supporting the model have not been replicated, and the mediating role of emotions in the threat-behavior link remains in need of empirical evidence. The present studies were aimed at providing a test of the three paths hypothesized by the sociofunctional model, from perceived threats to behavioral intentions via specific emotions.

## The five threat-emotion-behavior profiles proposed by the sociofunctional model

Regarding the first threat-emotion-behavior profile, namely the 'obstacle-anger-aggression' profile, research has shown that anger emerges when people are prevented from attaining their goal (e.g., Berkowitz, 2012) and motivates various aggressive behaviors in order to remove the obstacle preventing goal achievement (Berkowitz, 2012; Carver & Harmon-Jones, 2009; Cottrell & Neuberg, 2005). In this way, Cottrell and Neuberg argues that anger arises when outgroup is perceived as a threat to ingroup's goal achievement, motivating aggressive reactions. The model identifies six specific threats falling within this framework. This is the case when the outgroup (1) threatens ingroup's economic resources, (2) threatens ingroup property, (3) threatens personal freedoms and rights, (4) when the outgroup does not want to reciprocate relationship with the ingroup, (5) when the outgroup is seen as a threat for social coordination and finally, (6) when the ingroup does not trust the outgroup.

The second path is referred to as the 'contamination-disgust-rejection' profile. Disgust arises when people encounter physical or moral contaminants, resulting in rejection behavior to protect the self (e.g., Rozin, Haidt, & McCauley, 1999). The sociofunctional model then argues that outgroups elicit disgust (1) when they are perceived

as a source of disease (physical contaminant) or (2) when they support ideas opposed to those of the ingroup (moral contaminant; Cottrell & Neuberg, 2005). Both specific threats would lead to avoidance behaviors or to rejection of threatening outgroups in order to preclude contamination (Cottrell & Neuberg, 2005; Neuberg & Cottrell, 2002; Rozin et al., 1999).

The third profile is the 'safety-fear-escape' profile. Research has shown that fear emerges when people are physically endangered and this emotional reaction motivates escape behaviors (e.g., Ledoux, 1996). The sociofunctional model suggests that outgroups perceived as threatening for ingroup's physical safety elicit fear in ingroup members that ultimately results in motivation to escape (Ledoux, 1996; Neuberg & Cottrell, 2002).

According to the 'reciprocity by inability-pity-prosocial behavior' profile, pity arises from an outgroup perceived as unable to reciprocate intergroup relationships (Cottrell & Neuberg, 2005). At the behavioral level, pity would lead to prosocial behaviors (Camps, Stouten, Tuteleers, & van Son, 2014) in order to improve the ability of the outgroup members to reciprocate in the future.

Finally, the fifth profile is 'morality-guilt-repair.' Cottrell and Neuberg (2005) argue that guilt is elicited by groups that represent a threat to the ingroup's morality, especially as a result of negative ingroup actions toward this group (e.g., Branscombe, Doosje, & McGarty, 2002). Because of outgroup suffering, ingroup members may be motivated to behave in a way that restores their image of moral group, such as helping outgroup members (e.g., Ketelaar & Au, 2003).<sup>1</sup>

In the first test of their model, Cottrell and Neuberg (2005) asked Americans students to assess threats and affective reactions evoked by several social groups. They observed that, regardless of the group, the set of specific perceived threats predicted the hypothesized set of emotions. By demonstrating the threat-emotion profiles, Cottrell and Neuberg (2005) provided preliminary evidence in support of their model. However, even though they hypothesized an effect of the threat-emotion profiles on behavioral intentions toward outgroups, they did not provide an empirical support to this hypothesis.

In an attempt to fill this gap, several studies have shown that threat-emotion profiles evoked by groups predicted policy attitudes (Cottrell, Richards, & Nichols, 2010) or behavioral intentions toward groups (Johnston & Glasford, 2014; Kamans, Otten, & Gordijn, 2011; Kuppens & Yzerbyt, 2012). For example, when physically threatened by an outgroup, powerless people report being scared and willing to escape the situation. In contrast, when valuable resources are threatened, they report anger and intention to confront the outgroup (Kamans et al., 2011). Consistent with the sociofunctional model, this research showed that perceiving a threat to physical safety triggers fear and motive escape reactions while perceiving a threat to resources arouses anger feelings and motivate aggression. Moreover, Johnston and Glasford (2014) showed that different threat-emotion profiles were related to either passive or active harm (Cuddy, Fiske, & Glick, 2007). In this study, American participants evaluated three groups (i.e., activist feminist,

gay men and Mexican Americans) on threats (i.e., obstacle, contamination, physical safety), emotions (i.e., anger, disgust, fear) and harm (passive and active harm) these groups represented to American people. Results showed that the obstacle-anger profile was related to active harm (i.e., attack, harass) whereas contamination-disgust and physical safety-fear profiles were related to passive harm (i.e., exclude, demean). In addition, by showing that each emotion mediated the expected link between threat and harm, these findings provide empirical data supporting the sociofunctional model. However, this research presents several limitations. First, participants were asked to respond from the perspective of 'Americans.' Such questions might measure shared knowledge concerning social group's profiles rather than individuals' adhesion to this knowledge. As a result, it may not be truly indicative of individual behaviors toward these groups. Then, the order of threats, emotions and behaviors measures were presented in a fixed order. It is possible that this presentation format constrained participants' responses and partially account of the observed relationships between the constructs.

To our knowledge, no empirical research has thus far tested the relevance of all threat-emotion-behavior profiles hypothesized by Cottrell and Neuberg (2005). Our aim was to provide such a test. To this end, we used a correlational design similar to the one used by Cottrell and Neuberg (2005) in which participants were asked to report the perceived threats posed by groups as well as their felt emotions toward these groups and their behavioral intentions towards them. These social groups were selected in order to offer a wide variety of emotional and behavioral reactions in our population. Although such a design does not make it possible to test the causal links hypothesized by the sociofunctional model, it allows capturing a wide range of threats, emotions and behavioral intentions, and thus their potential links at the individual level and beyond normative reactions to social groups.

Some of the measures were general and others were more specific. General measures captured the perceptions of social groups on the positive-negative continuum (i.e., general threat, global prejudice, approach-avoidance intentions) while specific measures were related to more fined-grained threats, emotions, and behavioral intentions, as it is described in the sociofunctional model.

We first expected to replicate Cottrell and Neuberg's results (2005), namely that each of the five specific threats should predict the suspected emotion (H1a). However, our main aim was to test their links with behavioral intentions. We thus hypothesized that each behavioral intention should predominantly be predicted by one of the five threats (H1b) and one of the five emotions (H1c) as described in the sociofunctional model. More importantly, we tested the five threat-emotion-behavioral intention profiles by evaluating the mediating role of emotions in the threat-behavioral intention links (H2). Specifically, we hypothesized that anger should mediate the link between obstacle threat and the tendency to aggress outgroup members (i.e., to remove the obstacle posed by the group; Carver & Harmon-Jones, 2009). Disgust should mediate

the link between contamination threat and the tendency to reject objects or ideas of outgroup members (i.e., to minimize contamination; Rozin et al., 1999). Fear should mediate the link between the threat to physical safety and the tendency to escape the outgroup (Neuberg & Cottrell, 2002; Ledoux, 1996). Pity should mediate the link between the threat to reciprocal relationships with the ingroup by inability and the tendency to act in a prosocial way toward the outgroup (e.g., by helping them; Camps et al., 2014; Penner, Dovidio, Piliavin, & Schroeder, 2005). Guilt should mediate the link between the ingroup's morality threat and the tendency to restore balanced relationships with outgroup members (e.g., by helping them; Ketelaar & Au, 2003). Finally, we tested a secondary hypothesis, namely if, as predicted by the sociofunctional model, specific emotions are better predictors of behavioral intentions than global prejudice, then each of the five threat-behavioral intention links should be better mediated by the predictable emotion than by global prejudice (H3).

Unlike Cottrell and Neuberg (2005), it is worth noting that, in our studies, participants assessed only one social group. This point is of particular importance as each group was thus evaluated independently, reducing the influence of comparison processes and of experimental demand. In addition, the groups of measures (threats, emotions, and behavioral intentions) were presented in a random order for each participant to reduce the likelihood of systematic measure contamination.

## Study 1

### Method

#### Participants

According to Green (1991), the minimum sample size would require  $N \geq 50 + 8 \times$  number of predictors (here, 5), that means at least 90 participants for our study. However, because we had twelve groups to evaluate and wanted to obtain relatively stable evaluation for each group, we planned to obtain at least 25 participants per group (for a total of at least 300 participants). A total of 397 participants completed the questionnaire. Fifteen were removed from the sample because they were not native French speakers. Thirteen other reported not being students and nine strongly identified to the outgroup they assessed (i.e., score > 6 on a 9-point scale, see below). Finally, 360 participants were maintained in the sample (325 women;  $M_{age} = 20.25$ ,  $SD_{age} = 2.90$ ). Twenty-seven to 34 participants evaluated each group. The proportion of women,  $\chi^2(11) = 10.20$ ,  $p = .51$ , and age,  $F(11, 348) = 0.38$ ,  $p = .96$ , did not differ between group conditions. Most of participants were psychology students (95%), the remaining participants being students in social sciences. They completed the questionnaire after clicking on a link submitted on the Facebook pages of psychology students of three French universities.

#### Procedure

Participants clicked on the link and then signed a consent form before filling the questionnaire administered in French. Each participant assessed only one group randomly selected among 10 outgroups (i.e., Africans, Arabs,

Asian French, Unemployed, Homeless people, Right-wing extremists, Gypsies, Physically disabled people, Obese people, HIV-positive people) and two ingroups (i.e., native-born French people and Students). Pretests showed that these two ingroups were not perceived as threatening by French students, and that they globally evoked positive feelings.

The groups were selected on the basis of the threats and emotions they convey. We wanted to use a wide range of social groups in order to obtain various profiles of threats, emotions, and behavioral intentions. We selected the groups on the basis of work from public institutions, associations fighting against prejudice and newspaper articles. Asian French are stereotypically perceived as possessing numerous of shops with cheap wear in France, thus this group should be perceived as threatening for job or economic resources of French people (because of perceived unfair competition). Unemployed people are considered as responsible for their situation, particularly because they are stereotyped as lazy (Milland & Flament, 2010). Thus, the Unemployed might be perceived as threatening for reciprocity by choice, as well as for social coordination and trust relations with the French nation. Right-wing extremists promote protectionist ideas and are perceived as racist among students. As a result, they should be perceived as threatening to rights and liberties, as well as to social coordination and values of French students. Furthermore, because they are stereotypically associated with extremist Muslims, Arabs were expected to be perceived as threatening for physical safety and to evoke fear (Dotsch & Wigboldus, 2008). Homeless people are stereotypically associated with mental illness, drugs, and alcohol consumption, laziness, and dirt. Thus, they should be perceived as threatening physical safety of French students (i.e., 'they are crazy, thus they can be violent'). Moreover, they should threaten relations of reciprocity with French nation because they choose not to reciprocate (i.e., 'they are lazy') or for reasons outside of their control (i.e., 'they are crazy'). Finally, they should be perceived as threatening ingroup health (i.e., 'they are dirty'; Harris & Fiske, 2006). Obese people are stereotyped as dirty and lazy because they are perceived as responsible for their extra weight. Thus, they should be perceived as posing a contamination threat via physical contamination (Rozin et al., 1999) or transmission of poor moral values (Vartanian, 2010). HIV-positive people suffer a transmittable disease. Thus, as they could be contaminant, they should be perceived as posing a threat to physical health (Earnshaw, Smith, Chaudoir, Lee, & Copenhaver, 2012) and hence to physical safety. Gypsies are stereotypically perceived as thieves and beggars (Guimelli & Deschamps, 2000; Echebarria Echabe & Fernandez Guede, 2006). Thus, they should be perceived as posing a threat to ingroup property, physical safety, and ingroup values. Physically disabled people are perceived as incompetent but courageous (Rohmer & Louvet, 2011). Thus they should evoke pity because they should be perceived as willing but being unable to reciprocate equally. Moreover, they have been shown to evoke disgust because of their physical anomaly (Park, Faulkner, & Schaller, 2003). Finally, French Africans

should be perceived as threatening for the perception of ingroup's morality. Some African countries were French colonies, thus current difficulties of Africans people are often perceived by French people as the results of a long exploitation of Africans wealth from French government.

It is worth mentioning that we were not interested in whether each social group evokes the suspected threat, emotion and behavioral intention. Our aim was instead to test whether each of the five threat-emotion profiles evoked by groups predicted behavioral intentions toward them. Thus our hypotheses focused specifically and uniquely on the links between several variables characterizing the selected groups, independently of the specific group under consideration. In other words, what we were expecting was to collect reactions to groups evoking a wide range of threats and emotions, no matter the specific links between each target group and the threat-emotion-behavioral intention profiles.

As in Cottrell and Neuberg's study (2005), the questionnaire included general and specific measures of both perceived threats and emotions to which we added measures of general and specific behavioral intentions. Items reflecting threats and emotions were adapted from Cottrell and Neuberg's work. Each group of measures (threats, emotions, and behavioral intentions) always began with the general measure that was immediately followed by specific measures presented in a random order. The same applies for the order of the group of measures (threats, emotions, and behavioral intentions) that was randomly determined for each participant.

#### Measures of threats

Participants first indicated the extent to which each group was dangerous and represented a threat for France and French people (general threat; all responses were given on 9-point scales; 1 = *strongly disagree*; 9 = *totally agree*), and then the extent to which it was perceived as representing specific threats (all responses were given on 9-point scales; 1 = *strongly disagree*; 9 = *totally agree*). For the six obstacle threats, participants indicated the extent to which the group represented a threat to France and to French people concerning jobs and economic resources, properties, rights and freedoms, reciprocity relations by choice, social coordination, and trust relations. For the two contamination threats, participants indicated the extent to which the group was threatening physical health and values of French people. For the physical safety threat, participants indicated the extent to which the group was threatening for physical safety of French people. For the reciprocity by inability threat, participants indicated the extent to which the group threatened the reciprocity of their relationships with French people due to group's inability. Finally, for the morality threat, participants indicated the extent to which the group was threatening to the morality of French people. Each of these 11 specific threats was measured with two items.

#### Measures of affective reactions

Participants indicated the extent to which they were experiencing each type of emotional feelings when they were thinking about the social group (9-point scales; 1 = *not at all*; 9 = *extremely*). General affect was assessed

by asking participants to indicate the degree to which they were experiencing positive as well as negative feelings toward the target group through two independent items. Then participants reported the extent to which they were feeling specific emotions when thinking about the target group. Following Cottrell and Neuberg's procedure (2005), we measured emotions directly relevant for the sociofunctional model while the other emotions (i.e., envy, happiness, respect, contempt, sadness, pride, security, and sympathy) were included as filler items to create a broader context.<sup>2</sup>

#### Measures of behavioral intentions

Participants indicated the extent to which they tended to exhibit each behavioral reactions toward the target group on 9-point scales (1 = *not at all*; 9 = *extremely*). First, participants indicated the extent to which they tend to approach and to avoid members of the target group with two independent items. Then, we measured more specific behavioral intentions. Participants had to indicate the extent to which they tend to behave aggressively toward the target group, to escape the target group, to rejection objects or ideas from the target group, and to help the target group. The four broad categories of behavioral intentions were based on the five threat-emotion profiles proposed by the sociofunctional model. Because the reciprocity by inability-pity-prosocial behavior and morality-guilt-repair profiles involved the same kind of behavior (i.e., help), we created a common item to measure behavioral intentions of these two profiles.

Finally, in order to ensure that participants identified with the ingroups and not with the outgroups, participants were asked to indicate the extent to which they were identifying with the outgroup that they were assessing as well as with each of the two ingroups (1 = *not at all*; 9 = *totally*).

## Results

#### Data simplification and check

**Composite scores and difference scores.** In order to make data processing easier, we created a composite score for each category of threats, emotions, and behavioral intentions. We first averaged the scores of the 12 items measuring obstacle threats,<sup>3</sup>  $\alpha = .96$ , to create one composite score. The same was done with the four items measuring contamination threats,<sup>4</sup>  $\alpha = .76$ . For the two-item scales, reliability of the measure was estimated by Spearman-Brown correlations, as recommended by Eisinga, Grotenhuis and Pelzer (2013). Correlations were significant for the two items measuring safety threat,  $r_s = .57$ ,  $p < .001$ , the two measuring reciprocity by inability,  $r_s = .26$ ,  $p < .001$ , and the two measuring morality threat,  $r_s = .46$ ,  $p < .001$ , categories. For emotions, we created a score for anger,  $r_s = .33$ ,  $p < .0001$ , and for fear,  $r_s = .59$ ,  $p < .0001$ . Disgust, pity, and guilt, were measured with only one item per emotion. This was also the case for the four behavioral reactions.

Then, we computed a measure of global prejudice by subtracting the score of item measuring the general positive feeling toward the target group from the score of the item measuring the general negative feeling. The higher the score, the stronger the global negative prejudice.

Finally, we created a global measure of approach-avoidance tendencies by subtracting approach score from the avoidance one for each target group. The higher the score, the more the group activate avoidance.

**Check of group's heterogeneity of evaluations.** To ensure that outgroups evoked different patterns of specific threats, emotions, and behavioral intentions, we performed three independent ANOVAs by including the groups and each category of specific measures (perceived threats, emotions, or behavioral intentions), the last one being treated as a within-subjects factor. For each ANOVA, results showed a significant main effect of group,  $F_s < 14.17$ ,  $ps < .001$ ,  $\eta^2_p s > .26$ , and of specific measure,  $F_s > 60.62$ ,  $p < .001$ ,  $\eta^2_p s > .15$ . Importantly, each interaction reached significance,  $F_s > 11.86$ ,  $ps < .001$ ,  $\eta^2_p s > .27$ , indicating that groups evoked different patterns of specific threats, emotions, and behavioral intentions.

Multiple regression analyses

**H1a: from threats to emotions.** We regressed each emotion score on the five threat categories simultaneously. As depicted in **Table 1**, results showed that each threat category predicted the expected emotion, all  $bs > .13$ ,  $ts(354) = 1.95$ ,  $ps < .05$ . The results indicate that the links hypothesized by the sociofunctional model are all significant. It is however worth noting, that as in Cottrell and Neuberg seminal work (2005, p. 781, Table 5), each threat predict also other 'secondary' emotions. For instance, obstacle threat category also predicted disgust, fear, and guilt,

$bs > |.26|$ ,  $ts(354) > 2.93$ ,  $ps < .004$ . In terms of secondary emotions, this may be explained by the fact that obstacle threat is qualified as an obstacle to ingroup's goal achievement, a feature that is inherent to many threat categories.

**H1b: from threats to behavioral intentions.** We performed several multiple regressions with each behavioral intention as outcome and the five threat categories as predictors (see **Table 2**). Results showed that three of the five threat categories predicted the expected behavioral intentions (obstacle, contamination, morality),  $bs > .13$ ,  $ts(354) = 1.95$ ,  $ps < .05$ , the two remaining categories (safety, reciprocity by inability) were not significant,  $bs < .11$ ,  $ps > .09$ . Moreover, once again, obstacle threat predominantly predicted each behavioral reaction,  $bs > |.26|$ ,  $ts(354) > |2.95|$ ,  $ps < .003$ .

**H1c: from emotions to behavioral intentions.** We conducted five multiple regressions by regressing each behavioral intention on the five emotions simultaneously (see **Table 3**). Anger, disgust, and fear significantly predicted respectively aggression, rejection, and escape,  $bs > .18$ ,  $ts(354) > 2.59$ ,  $ps < .01$ . However, pity and guilt did not predict help intentions,  $bs < .10$ ,  $ps > .09$ . Moreover, unlike previous results, disgust predominantly predicted each behavioral intention,  $bs > .28$ ,  $ts(354) > 4.39$ ,  $ps < .001$ .

Mediation analyses

**H2: testing the five threat-emotion-behavioral intention profiles.** We first tested a simple mediation model with 5000 bootstrap samples (Preacher & Hayes, 2008) includ-

**Table 1:** Standardized Regression Coefficients of Each Emotion on Threat Categories in Study 1.

Independent Variable	Dependent Variable				
	Anger	Disgust	Fear	Pity	Guilt
Obstacle	<b>.42***</b>	.33***	.35***	.10	-.26**
Contamination	.28***	<b>.31***</b>	.09	.21*	.03
Safety	-.09	-.02	<b>.13*</b>	-.01	.07
Rec. Inability	.15***	.15***	.13**	<b>.16**</b>	.19***
Morality	.11**	-.05	-.02	.15**	<b>.25***</b>

Note. Rec. Inability = Reciprocity by inability threat category. Regression coefficients in boldface type reflect the predictions. \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ .

**Table 2:** Standardized Regression Coefficients of Each Behavioral Reaction on Threat Categories in Study 1.

Independent Variable	Dependent Variable			
	Aggress.	Rejection	Escape	Help
Obstacle	<b>.52***</b>	.46***	.40***	-.26**
Contamination	.16*	<b>.29***</b>	.15*	-.25**
Safety	-.15*	-.07	<b>.11</b>	.13
Rec. Inability	.08	.15***	.08	<b>-.02</b>
Morality	-.02	-.07	-.01	<b>.12*</b>

Note. Rec. Inability = Reciprocity by inability threat category. Aggress. = Aggression. Regression coefficients in boldface type reflect the predictions. \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ .

**Table 3:** Standardized Regression Coefficients of Each Behavioral Reaction on Emotions in Study 1.

Independent Variable	Dependent Variable			
	Aggress.	Rejection	Escape	Help
Anger	<b>.18*</b>	.16*	.00	.06
Disgust	.28***	<b>.48***</b>	.46***	-.37***
Fear	.20**	.17**	<b>.33***</b>	-.14*
Pity	-.09	-.12*	-.03	<b>.01</b>
Guilt	-.05	.00	-.04	<b>.10</b>

Note. Aggress. = Aggression. Regression coefficients in boldface type reflect the predictions. \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ .

ing the general threat as predictor, the global prejudice as mediator and approach-avoidance index as outcome. Results showed that general threat significantly predicted global prejudice,  $b = 1.23$ ,  $t(357) = 18.06$ ,  $p < .001$ ,  $\eta_p^2 = .48$ , and approach-avoidance index,  $b = 0.91$ ,  $t(357) = 11.79$ ,  $p < .001$ ,  $\eta_p^2 = .28$ . Moreover, the mediating effect of general prejudice emerged,  $b = 0.81$ , 95% CIs [0.68, 0.95], indicating that the greater the general threat, the more participants expressed negative feelings and the more they tended to avoid the target group. This finding reflects the basic view of general prejudice. However, our aim was to go one step further by exploring the role of specific emotions in the threat-behavior link. To this end, we tested a multiple mediation model with 5000 bootstrap samples (Preacher & Hayes, 2008) for each hypothesized threat-emotion-behavior profiles described in the sociofunctional model.

The threat predictor, the behavioral intention outcome, and the five emotions mediators were included in the model (see **Figure 1**). The benefit of this method is that it allows testing the mediational weight of each emotion in the threat-behavior link. Indeed, we expected that each specific threat would guide the behavioral intention toward group through a specific emotion. However, because perception of a specific threat can imply the presence of another threat (e.g., threat to health implies a threat to physical safety), it is possible, as we have observed in the previous analyses, that a single threat elicits a main emotion as well as other secondary emotions (Cottrell & Neuberg, 2005; Neuberg & Cottrell, 2002). Thus, one may suspect that secondary emotions have played a major mediating role in the expected threat-behavior link. Multiple mediation model bypasses this problem by controlling all mediators included in the model.

We first analyzed the obstacle-anger-aggression profile. Obstacle threat was found to predict anger,  $b = 0.63$ ,  $t(353) = 14.82$ ,  $p < .001$ ,  $\eta_p^2 = .38$ , and aggression,  $b = 0.50$ ,  $t(353) = 12.90$ ,  $p < .001$ ,  $\eta_p^2 = .32$ . However, anger did not mediate the threat-aggression link,  $b = 0.03$ , 95% CIs [-0.04, 0.12], while, surprisingly, disgust did,  $b = 0.09$ , 95% CIs [0.01, 0.18]. No other mediating effect emerged,  $bs < 0.05$ , 95% CIs [-0.02, 0.13].

Then, we analyzed the contamination-disgust-rejection profile. Contamination threat was found to significantly

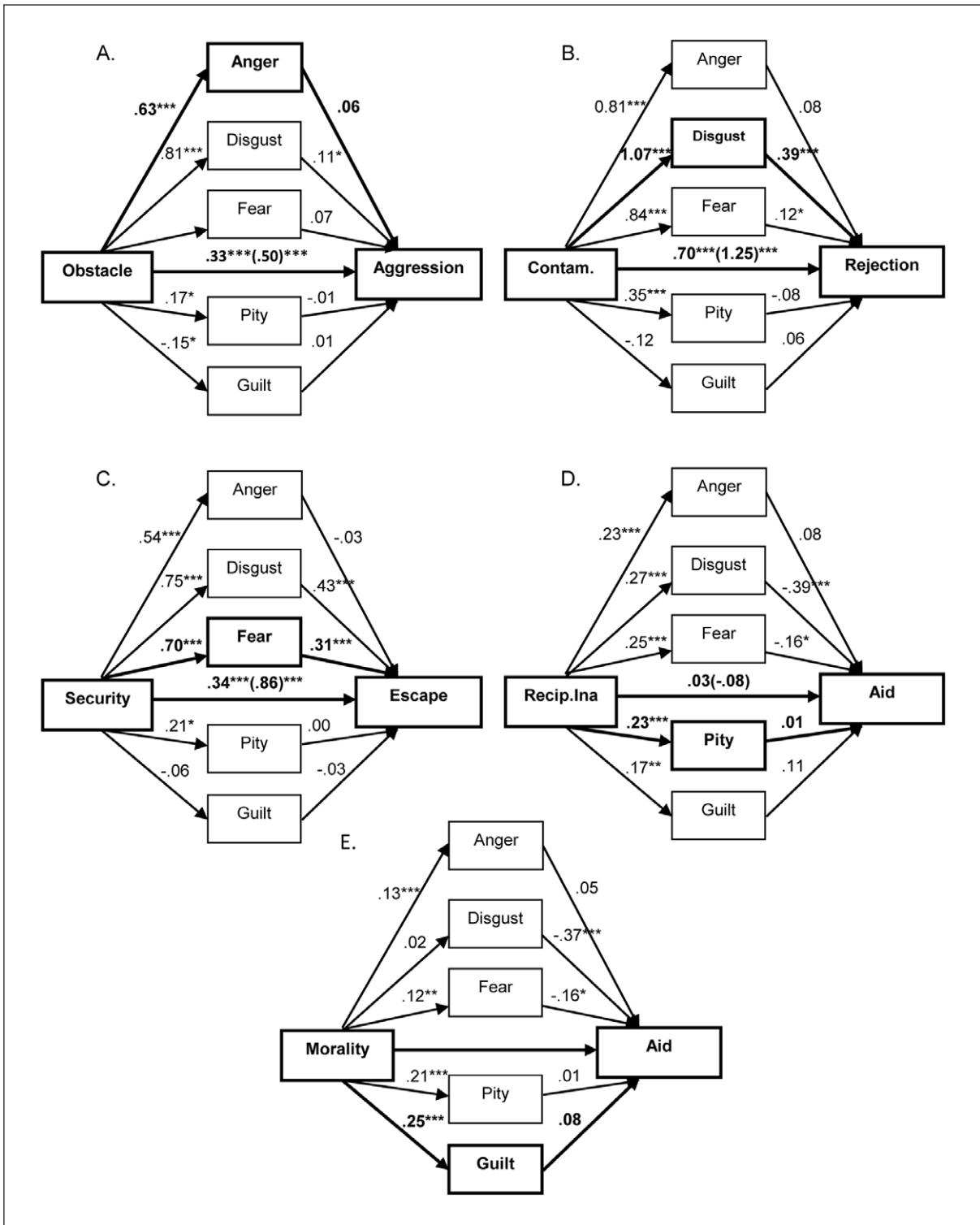
predict disgust,  $b = 1.07$ ,  $t(353) = 13.83$ ,  $p < .001$ ,  $\eta_p^2 = .35$ , and rejection,  $b = 1.25$ ,  $t(353) = 15.60$ ,  $p < .001$ ,  $\eta_p^2 = .41$ . Moreover, the expected indirect effect of disgust emerged,  $b = 0.42$ , 95% CI [0.25, 0.62]. The greater the threat to contamination, the more disgust was experienced, and the more participants tended to reject the outgroup. Note that fear also mediated the contamination-rejection link,  $b = 0.10$ , 95% CI [0.00, 0.62]. The remaining mediating effects did not emerge,  $bs < |0.06|$ , 95% CIs [-0.09, 0.21].

For the safety-fear-escape profile, safety threat significantly predicted fear,  $b = 0.70$ ,  $t(353) = 10.64$ ,  $p < .001$ ,  $\eta_p^2 = .24$ , and escape,  $b = 0.86$ ,  $t(353) = 11.41$ ,  $p < .001$ ,  $\eta_p^2 = .27$ . As expected, the mediating effect of fear emerged,  $b = 0.21$ , 95% CI [0.11, 0.34]. The greater the threat to physical safety, the more fear was felt, and the more participants tended to escape the outgroup. However, we also observed an unexpected indirect effect of disgust,  $b = 0.32$ , 95% CI [0.21, 0.46]. No other effect was significant,  $bs < |0.02|$ , 95% CIs [-0.11, 0.07].

For the reciprocity by inability-pity-help profile, reciprocity by inability threat was found to significantly predict pity,  $b = 0.23$ ,  $t(353) = 4.23$ ,  $p < .001$ ,  $\eta_p^2 = .05$ , but did not predict help,  $b = -0.08$ ,  $p = .13$ . We thus stopped mediation analysis.

For the last morality-guilt-help profile, threat to morality was found to significantly predict guilt,  $b = 0.25$ ,  $t(353) = 5.75$ ,  $p < .001$ ,  $\eta_p^2 = .08$ , and to marginally predict help,  $b = 0.10$ ,  $t(353) = 1.85$ ,  $p = .06$ ,  $\eta_p^2 = .01$ . However, guilt did not mediate the morality-help link,  $b = 0.02$ , 95% CI [-0.01, 0.06], whereas fear did,  $b = -0.02$ , 95% CI [-0.05, 0.00]. The stronger the morality threat, the more people were afraid and the less they were willing to help the outgroup. No other mediating effect emerged,  $bs < |0.02|$ , 95% CIs [-0.04, 0.06].

**H3: testing the global prejudice vs. emotion as predominant mediator.** We performed five multiple mediations (one for each profile) by including the specific threat as predictor, the specific behavioral intention as outcome, and the global prejudice and the predictable emotion as mediators (the other emotions were not included to avoid multicollinearity problems). Results showed that anger was a better predictor of aggression intention than global prejudice,  $b_{\text{anger}} = 0.13^*/b_{\text{prej}} = 0.09^*$  (coefficients with \* sign have CI positive limits). However, for the four other profiles, the global prejudice better mediated the



**Figure 1:** Multiple mediators models in Study 1 with threat categories as predictors, specific emotions as mediators, and behavioral intentions as outcomes. Threat-emotion-behavior path in bold are derived from the sociofunctional model. Regression coefficients are unstandardized. \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ .

threat-behavioral intention links compared to the emotion,  $b_{disg.} = 0.27^*/b_{prej} = 0.32^*$ ;  $b_{fear} = 0.22^*/b_{prej} = 0.27^*$ ;  $b_{pit} = 0.01/b_{prej} = -0.36^*$ ;  $b_{guilt} = 0.01/b_{prej} = 0.02$ .

**Discussion**

The present study partially replicated Cottrell and Neuberg's findings (2005), by showing that each threat systematically predicted the expected emotion. However,

results are somewhat obscured by the predominance of obstacle threat in predictions of emotions and behavioral intentions. It is worth noting that this result was also observed in the work by Cottrell and Neuberg (2005).

Moreover, regression analyses showed that threats and emotions only partially predicted expected behavioral intentions. It is possible that the absence of relationships comes from the quality of the items. Some formulations of

items were quite direct and probably hurt the sensitivity of participants. Consequently, they could have chosen the lowest points of the scales (e.g., safety items,  $M = 1.81$ ,  $SD = 1.41$ ) that would have not happened if the items were phrased in a more socially acceptable manner.

Regarding mediational analyses, the data provide relatively weak support to the sociofunctional model. The results showed that (1) only two out of the five profiles emerged (i.e., contamination-disgust-rejection and safety-fear-escape) and (2) except for the obstacle-anger-aggression profile, global prejudice better mediated the threat-behavioral intention links than emotion. One might argue that these mixed findings could be due to methodological limitations. We measured behavioral intentions with four items (aggression, rejection, escape, help) that have been created from the five specific emotions included in the model. However, by condensing the behavioral intentions into four broad categories, we potentially missed some of the behavioral intentions. Second, IP addresses were not registered. Therefore, we could not rule out the possibility that participants answered the questionnaire several times. Third, some emotions were measured with two items (i.e., fear and anger) but others were measured with only one item (i.e., disgust, pity, and guilt), which could cast doubt on the reliability of these measures. To address all of these issues, we conducted a second study.

## Study 2

This study followed the methodology of Study 1. The study measured the same perceived threats, specific emotions and behavioral intentions toward the same groups as the previous study. Some items were modified for a better understanding but the content remained very similar to Study 1. Moreover, we measured more specific behavioral intentions. These items were inspired by unpublished items sent to us by the authors of the model. Finally, emotions were all measured with two items. We expected to find all the threat-emotion-behavior profiles described in the sociofunctional model.

## Method

### Participants

To estimate the sample, we applied the same method as in Study 1. A total of 384 questionnaires were completed. When a same IP address appeared twice, we only the first response was included in the sample thus, excluding therefore 41 participants. Moreover, 14 participants reported not to being students and 12 strongly identified to the outgroup they assessed (i.e., score > 6 on a 9-point scale). Finally, 317 participants were maintained in the sample (289 women;  $M_{age} = 21.28$ ,  $SD_{age} = 4.54$ ). The proportion of women,  $\chi^2(11) = 14.33$ ,  $p = .21$ , and age,  $F(11, 305) = 0.72$ ,  $p = .71$ , did not differ between group conditions. Most of participants were psychology students (91%), the remaining participants were students from social sciences.

### Procedure

To start the questionnaire, participants clicked on a link posted on the Facebook pages of French psychology student groups and signed a consent form. Twelve groups

were evaluated (i.e., Africans, Arabs, Asian French, Unemployed, Homeless people, Right-wing extremists, Gypsies, Physically disabled people, Obese people, HIV-positive people, native-born French people, and Students). The questionnaire is presented in Appendix.

### Measure of threats

After the general threat, the eleven specific threats were each measured with two items (presented in a random order). Specific threats were those described by the sociofunctional model (see Study 1). All threats were measured on a 9-point scale (1 = *strongly disagree*; 9 = *totally agree*).

### Measures of affective reactions

Participants first indicated their general affect (two positive and two negative feelings items) toward the target group. Then, they indicated the extent to which they were feeling specific emotions about the target group (9-point scale; 1 = *not at all*; 9 = *extremely*). Items were presented in a random order. Emotions were the same as in Study 1 (anger, disgust, fear, pity, guilt for target emotions; envy, happiness, respect, hurt, sadness, pride, security, and sympathy for filler items), all measured with two items.

### Measures of behavioral intentions

Participants first indicated the extent to which they exhibited general positive and negative behavioral intentions toward the target group with two items for each intention. Then, we measured behavioral intentions associated with the 11 specific threats with two items for each (presented in a random order). Participants answered with 9-point scales (1 = *strongly disagree*; 9 = *totally agree*).

Finally, as in study 1, we measured participants identification to ingroups and to the outgroup they assessed (1 = *not at all*; 9 = *totally*).

## Results

### Data simplification and check

**Composite scores and difference scores.** As in Study 1, we created a composite score for each category of threats, emotions, and behavioral intentions. For obstacle threats, we averaged the scores of the 12 specific threats to create one unique score ( $\alpha = .95$ ).<sup>5</sup> The same procedure was used for the 12 items of behavioral intentions linked to obstacle threat ( $\alpha = .84$ ). For contamination threat, the two items reflecting the threat to health,  $r_s = .44$ ,  $p < .001$ , and the 2 items reflecting the threat to values,  $r_s = .71$ ,  $p < .001$ , were averaged. The same was done for behavioral intentions linked to contamination threat (behavioral intentions linked to health threat,  $r_s = .67$ ,  $p < .001$ ; behavioral intentions linked to values threat,  $r_s = .32$ ,  $p < .001$ ).<sup>6</sup> Moreover, correlations between items measuring the threat of reciprocity by inability and their associated behavioral intentions were significant but really weak ( $r_s = |.14|$ ,  $ps = .01$ ). Thus we decided to exclude these data from all analyses. Finally, the two scores of each remaining threat (i.e.,  $r_{s-safety} = .55$  and  $r_{s-morality} = .40$ ,  $ps < .0001$ ), each associated behavioral intention (i.e., respectively,  $r_s = .52$  and  $r_s = .27$ ,  $ps < .0001$ ) and each emotion (i.e.,  $r_{s-fear} = .73$  and  $r_{s-guilt} = .57$ ,  $p < .0001$ ) were independently averaged.



Then we computed scores of general measures. The scores of items measuring general threat, negative feelings, positive feelings, negative behavioral intentions ( $r_s > .69, ps < .0001$ ) and positive behavioral intentions ( $r_s = .36, ps < .0001$ ) were independently averaged to create several composite scores,  $ps < .001$ . Finally, we subtracted the positive feelings score (approach intentions) toward the target group from the score of the item measuring negative feelings (avoidance intentions). The higher the score, the stronger the global negative prejudice (the avoidance intention).

**Check of group's heterogeneity of evaluations.** To ensure that outgroups evoked different patterns of specific threats, emotions, and behavioral intentions, we performed three independent ANOVAs by including the groups and each type of specific measures (perceived threats, emotions or behavioral intentions), the last one being treated as a within-subjects factor. For each ANOVA, results showed a main effect of groups,  $F_s > 9.50, p < .001, \eta^2_p > .35$ , and a main effect of specific measure,  $F_s > 94.99, ps < .001, \eta^2_p > .24$ . Importantly, each interaction was significant,  $F_s < 10.50, ps < .001, \eta^2_p > .27$ , attesting to the diversity of threats, emotions, and behavioral intentions evoked by the groups.

Multiple regression analyses

**H1a: from threats to emotions.** We conducted five multiple regressions by regressing each emotion score on the five threats simultaneously. As depicted in **Table 4**, results

showed that each threat predicted the expected emotion,  $bs > .18, ts(311) = 3.52, ps < .001$ , except for values threat that was not significant,  $b = .11, p = .16$ . Again, some threats also predict other 'secondary' emotions such as the obstacle threat which predicted disgust and fear.

**H1b: From threats to behavioral intentions.** Multiple regressions of each behavioral reaction of the five threats showed that each threat predicted the expected behavioral intention,  $bs > .27, ts(311) = 5.42, ps < .001$  (see **Table 5**).

**H1c: From emotions to behavioral intentions.** We regressed each behavioral intention on the four emotions predictors simultaneously. Results showed that each emotion predicted four of the five expected behavioral intentions,  $bs > .27, ts(311) = 5.22, ps < .001$  (see **Table 6**). The only exception was the disgust-reaction to values threat link that was not significant,  $b = .08, p = .23$ . Unexpectedly, anger strongly predicted behavioral intention linked to values threat,  $b = .11, t(311) = 7.60, p < .001$ . This could mean that value rejection would be a form of more passive (more socially acceptable) form of aggression.

Mediation analyses

**H2: Testing the threat-emotion-behavioral intention profiles.** As in Study 1, we first performed a simple mediation model with 5000 bootstrap samples (Preacher & Hayes, 2008) including the general threat as predictor, the global prejudice as mediator and approach-avoidance index as outcome. Results showed that the general threat significantly predicted global prejudice,  $b = 1.39, p < .001$ ,

**Table 4:** Standardized Regression Coefficients of Each Emotion on Threat Categories in Study 2.

Independent Variable	Dependent Variable			
	Anger	Disgust	Fear	Guilt
Obstacle	<b>.49***</b>	.24*	.18*	.02
Health	.12**	<b>.18**</b>	.16**	-.07
Values	.25***	<b>.11</b>	.12	-.13
Safety	.02	.17*	<b>.35***</b>	.07
Morality	-.04	.02	-.02	<b>.30***</b>

Note. Regression coefficients in boldface type reflect the predictions. \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ .

**Table 5:** Standardized Regression Coefficients of Each Behavioral Intention on Threat Categories in Study 2.

Independent Variable	Dependent Variable				
	Aggress.	Phys. rejection	Values rejection	Escape	Repair
Obstacle	<b>.63***</b>	-.19	.28**	.25*	-.29**
Health	.11**	<b>.43***</b>	-.01	.03	.02
Values	.10	-.02	<b>.43***</b>	-.13	-.14
Safety	.05	.19*	-.00	<b>.39***</b>	.01
Morality	-.07*	.06	-.03	.13**	<b>.27***</b>

Note. Aggress. = Aggression. Phys. rejection = Physical rejection. Regression coefficients in boldface type reflect the predictions. \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ .

**Table 6:** Standardized Regression Coefficients of Each Behavioral Intention on Emotions in Study 2.

Independent Variable	Dependent Variable				
	Aggress.	Phys. rejection	Values rejection	Escape	Repair
Anger	<b>.42***</b>	-.37***	.51**	-.13	-.28***
Disgust	.12*	<b>.41***</b>	<b>.08</b>	.06	-.07
Fear	.20*	.34***	.03	<b>.56***</b>	.01
Guilt	-.09*	.04	-.08	.10*	<b>.27***</b>

Note. Aggress. = Aggression. Phys. rejection = Physical rejection. Regression coefficients in boldface type reflect the predictions. \*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$ .

$\eta_p^2 = .48$ , and approach-avoidance index,  $b = 1.20$ ,  $p < .001$ ,  $\eta_p^2 = .36$ . Moreover, the indirect effect of general prejudice emerged,  $b = 1.08$ , 95% CI [0.92, 1.26], indicating that the greater the general threat, the more participants expressed negative feelings and the more they tended to avoid the target group. Then we performed multiple mediation analysis with the threat as predictor, the behavioral intentions as outcomes, and the four emotions as mediators (see **Figure 2**).

We started with the obstacle-anger-aggression profile. The obstacle threat was found to predict anger,  $b = 0.94$ ,  $t(311) = 20.55$ ,  $p < .001$ ,  $\eta_p^2 = .57$ , and the related behavioral intention,  $b = 0.57$ ,  $t(311) = 23.40$ ,  $p < .001$ ,  $\eta_p^2 = .64$ . However, the mediating effects of anger,  $b < -0.00$ , 95% CI [-0.07, 0.07] or of other emotions,  $bs < 0.04$ , 95% CIs [-0.03, 0.10], did not emerged.

Then, the subsequent analysis showed that the health threat predicted disgust,  $b = 0.73$ ,  $t(311) = 7.55$ ,  $p < .001$ ,  $\eta_p^2 = .15$  and the related behavioral intention,  $b = 0.27$ ,  $t(311) = 8.35$ ,  $p < .001$ ,  $\eta_p^2 = .18$ . Importantly, the expected mediating effect of disgust emerged,  $b = 0.20$ , 95% CI [0.08, 0.38]. The greater number of people who see a threat to ingroup health, the more disgust the participants experienced, and the more participants tended to reject physical contact with the outgroup. Unexpectedly, the mediating effect of anger,  $b = -0.25$ , 95% CI [-0.40, -0.14], and fear,  $b = 0.15$ , 95% CI [0.05, 0.29], also emerged. Thus, it seems that when participants felt threatened by contamination, they felt angry and the less they tended to aggress the outgroup. This is a mean of avoiding any contact with outgroup. The same could be argued for fear: The more participants felt threatened by contamination, the more they felt afraid and the more they tended to avoid the outgroup. No other mediating effect emerged,  $b = -.01$ , 95% CI [-0.03, 0.00].

For the values-disgust-rejection profile, the threat predicted disgust,  $b = 0.51$ ,  $t(311) = 9.58$ ,  $p < .001$ ,  $\eta_p^2 = .23$ , and the expected behavioral intention,  $b = 0.58$ ,  $t(311) = 15.55$ ,  $p < .001$ ,  $\eta_p^2 = .44$ . However, the mediating effect of disgust did not emerge,  $b = 0.03$ , 95% CI [-0.02, 0.09]. Interestingly, anger was the only significant mediating effect,  $b = 0.13$ , 95% CI [0.03, 0.23], indicating that the more participants perceived a threat to ingroup values, the more they were angry and desired to attack the outgroup. The remaining mediating effects were not significant,  $bs < |0.03|$ , 95% CIs [-0.09, 0.04].

For the physical safety-fear-escape profile, the threat significantly predicted fear,  $b = 0.74$ ,  $t(311) = 14.32$ ,  $p < .001$ ,  $\eta_p^2 = .40$ , and escape intentions,  $b = 0.45$ ,  $t(311) = 10.55$ ,  $p < .001$ ,  $\eta_p^2 = .26$ . Moreover, the expected mediating effect of fear emerged  $b = 0.22$ , 95% CI [0.13, 0.32]. The more participants felt threatened for ingroup safety, the more they experienced fear and the more they are motivated to escape the outgroup. Unexpectedly, anger also played a mediating role,  $b = -0.12$ , 95% CI [-0.21, -0.03]. This effect indicates that the more participants perceived a threat to safety, the more they felt angry and the less they tended to escape the outgroup. This could denote a participant's willingness to challenge the outgroup. No other effect emerged,  $bs < |0.01|$ , 95% CIs [-0.05, 0.09].

Finally, the morality threat significantly predicted guilt,  $b = 0.21$ ,  $t(311) = 5.47$ ,  $p < .001$ ,  $\eta_p^2 = .09$ , and repair intentions,  $b = 0.22$ ,  $t(311) = 4.78$ ,  $p < .001$ ,  $\eta_p^2 = .07$ . Moreover, as expected, the mediating effect of guilt emerged,  $b = 0.05$ , 95% CI [0.03, 0.09], indicating that the more people saw a threat to their moral image, the more they felt guilty and the more they engaged in repair behaviors. No other effects were significant,  $bs < 0.01$ , 95% CIs [-0.03, 0.03].

**H3: testing the global prejudice vs. emotion as predominant mediator.** As in Study 1, we tested five multiple mediation models (one for each profile) by including the specific threat as predictor, the specific behavioral intention as outcome and both global prejudice and the predicted emotion as mediator. Results showed that for the health-disgust-rejection, the security-fear-escape and the morality-guilt-repair profiles, the predictable emotion better mediated the threat-behavioral intention link than global prejudice,  $b_{disgust} = 0.20^*/b_{prej} = -0.07^*$ ;  $b_{fear} = 0.21^*/b_{prej} = -0.03$ ;  $b_{guilt} = 0.05^*/b_{prej} = 0.02$  (coefficients with \* sign have CI positive limits). By contrast, for both obstacle-anger-aggression and values-disgust-rejection profiles, global prejudice was a better mediator than the predictable emotion,  $b_{anger} = -0.03/b_{prej} = 0.12^*$ ;  $b_{value-disg.} = -0.01/b_{prej} = 0.16^*$ .

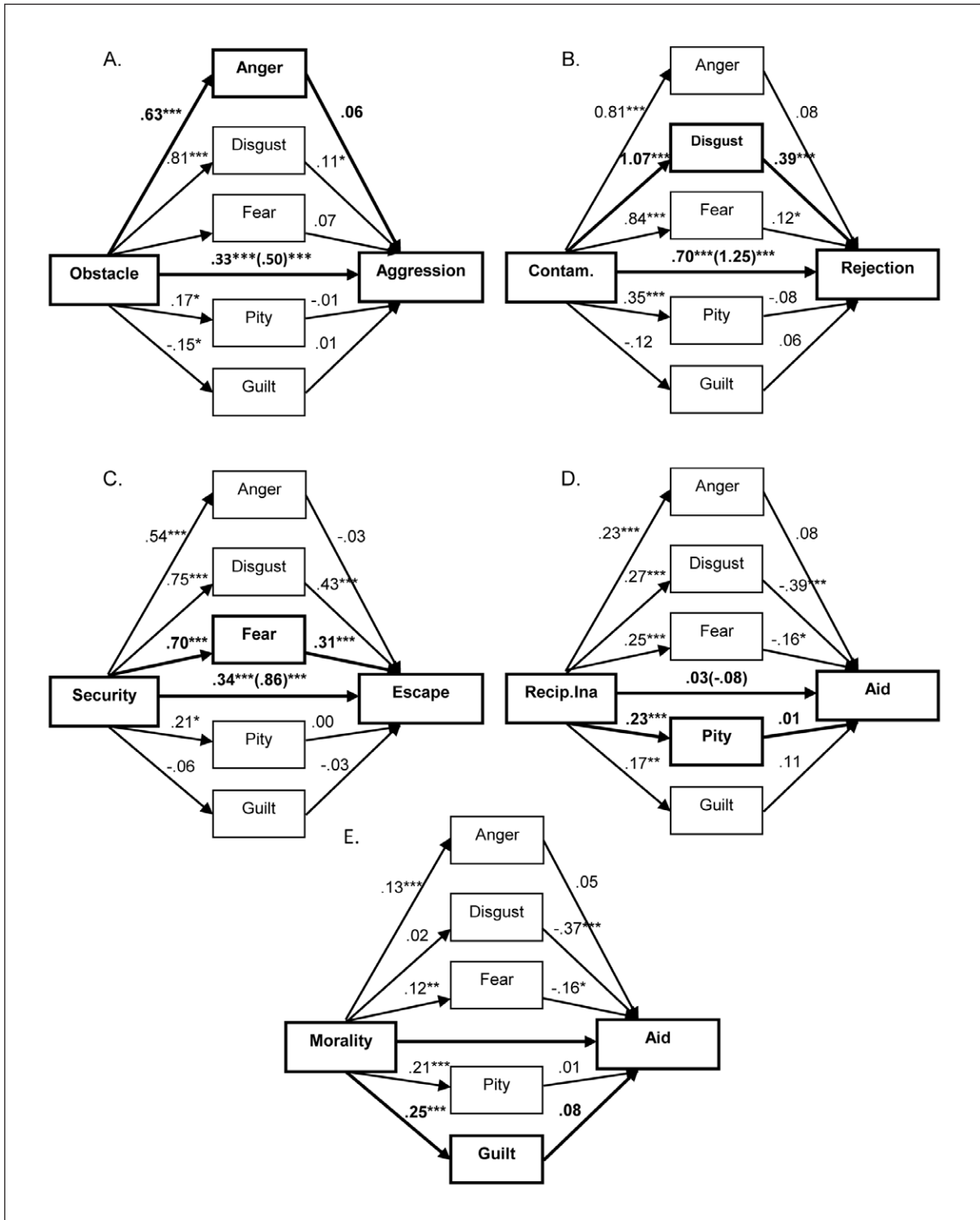
### Discussion

The results of Study 2 enlighten and complete those observed in Study 1. We again observed that threat categories globally predicted the related emotion (except for values threat, see below) as well as the related behavioral intention. Moreover, each emotion predicted behavioral intentions. Those findings provide support for the pro-

files described in the sociofunctional model. Though not the focus of this paper, we observe also that secondary emotions emerged, as predicted by the sociofunctional model. For example, obstacle threats predicted not only anger, but also fear and disgust (Cottrell & Neuberg, 2005).

However, the results of the mediation analyses testing more directly the hypothesized profiles are mixed. Three of the five mediations succeeded but two failed.

Specifically, disgust mediated the health-rejection link, fear mediated the physical safety-escape link and guilt mediated the moral-repair link. Importantly, global prejudice did not overtake the mediating role of the emotions. In contrast, as in Study 1, anger did not mediate the obstacle-aggression link. This result is of prime importance for the sociofunctional model, and will be further discussed in the General Discussion section.



**Figure 2:** Multiple mediators models in Study 2 with threat categories as predictors, specific emotions as mediators, and behavioral intentions as outcomes. Threat-emotion-behavior path in bold are derived from the sociofunctional model. Regression coefficients are unstandardized. \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ .

In addition, disgust did not mediate the values-rejection link. This could mean that disgust measures were too broad and did not differentiate physical disgust from moral disgust. Physical disgust occurs to protect the self from potential diseases contamination (Haidt, Rozin, McCauley, & Imada, 1997; Neuberg, Kenrick, & Schaller, 2011) whereas moral disgust refers to moral violation (Haidt et al., 1997). Consequently, physical disgust should occur when people perceive a threat to ingroup health whereas moral disgust should arise when people perceive a threat to moral values. However, it is worth noting that if the literature supports the hypothesis that physical disgust triggers rejection, this is not the case for the impact of moral disgust. Some argue that moral disgust is an extension of physical disgust (Rozin, Haidt, & McCauley, 1999) while others relate moral disgust to anger and thus to aggression behaviors (Jones, 2007; Lee & Ellsworth, 2013). Our results would support the second option since they suggest that a threat of values-rejection is linked to anger. As a result, our measures of anger may have captured the moral disgust feelings of participants that could not have been expressed in disgust measures. This explanation remains speculative and in need of further investigations.

Finally, we acknowledge that low correlations for some two items measures (e.g., the two items measuring the threat to moral values or those measuring behavioral intentions linked to morality threat) may be perceived as limitations of our findings. However, for correlations inferior to .40, we performed additional statistical analyses with the most prototypic item of the measured construct. Globally, results are similar to those presented in the core text and does not change conclusions.

### General Discussion

The aim of the present studies was to provide a complete test of the sociofunctional model. In support of the model, the findings first showed that (a) perceived threats predict the hypothesized emotions, (b) perceived threats predict hypothesized behavioral intentions and (c) emotions predict hypothesized behavioral intentions, as described in this model. These results replicate those of Cottrell and Neuberg (2005) and go one step further by providing evidence for the presently untested links between threats, emotions and behavioral intentions. Moreover, while the general threat-prejudice-behavioral intention profile predicted by the traditional views of prejudice emerged, our results showed that more specific measures better predict specific behavioral intentions (and ultimately, should better predict discriminatory behaviors).

The results on the mediations hypothesized by the sociofunctional model received only mixed support. In Study 1, only two mediations emerged and emotion better mediated the link between threat and behavioral intention for only one mediation. The results of Study 2 provided clearer evidence, but for only three profiles: health-disgust-rejection, safety-fear-escape, and the moral-guilt-repair. Interestingly, in this second study, emotions predicted behavioral intentions to a greater extent than global prejudice did. These findings support the emotional prejudice view that claims that emotions measures capture a diversity of (negative) feelings toward outgroups

that global prejudice measures obscure. The differences of results between the two studies moreover suggest that small variation in either the population and/or the material used to measure threats, emotions, and behavioral intentions can have a dramatic impact on the findings. Small differences with the original results can also be due to the non-comparative context of our research which contrasts with the one designed by Cottrell and Neuberg in which participants were evaluating all the groups and thus probably engage in comparison processes, something that is less likely here (i.e., participants evaluated only one group).

One particularly surprising result is related to the obstacle-anger-aggression profile. As expected, the threat-emotion, the threat-behavior, and the emotion-behavior links were significant. However, the emotional mediation failed in both studies and global prejudice better mediated the obstacle-aggression link in Study 2. Why did it fail? A first possibility could be related to the use of self-reported measures. The self-reported methodology is useful to test the model as a whole with minimal materials. These measures are supposed to reflect the reactions that participants would have in real life when encountering outgroup members. However, aggressive behaviors are socially undesirable and thus their expression can be highly constrained by social desirability. Although our experimental conditions have been optimized to reduce social desirability bias (e.g., study conducted on internet, anonymity), one cannot be sure that participants were honest or able to truly report what their reactions would be in situation. This analysis raises the question of the relevance of self-reported methodology for the obstacle profile, and more generally the hypotheses derived from this model. More engaging situations including measures of actual behaviors should provide a better context to test these hypotheses. We should note however that, although possible, such an explanation is rather unlikely. If participants were controlling their responses, we should not get any link between threats and emotions, between threats and behavioral intentions, and between emotions and behavioral intentions. Moreover, this explanation should also be true for emotions like disgust or fear. However, these profiles all emerged making such explanation unlikely.

Another explanation refers to the validity of the model. Although the obstacle profile seems correct at the theoretical level, it might not exist in real life. Two studies are not enough to conclude definitively on this issue, and an absence of results is not compelling evidence. However, these results raise concerns about this profile and by extension, about the contribution of the model as a whole. This is especially true because we have attempted to improve the methodology of previous studies by randomizing all measures groups, as well as all items within each group, and by having participants evaluate a unique group (instead of all in the original study), thus precluding comparison effects. Since the publication of this model, little research has been conducted including the behavioral component of the model (Johnston & Glasford, 2014; Kamans et al., 2011; Kuppens & Yzerbyt, 2012). Thus, replications of the present studies are needed to conclude about the obstacle-anger-aggression profile.

Then, our results differed from prediction of the model regarding both the health and the moral values profiles. While the tenants of the sociofunctional model aggregate these profiles in one contamination-disgust-rejection profile, our findings show that they may refer to two distinct profiles. Specifically, unlike the health profile, anger, and not disgust, mediated the link between moral values threat and moral rejection. As already mentioned, threat to moral values could trigger moral disgust while threat to health would trigger physical disgust (Simpson, Carter, Anthony, & Overton, 2006). Since moral disgust resembles anger (Lee & Ellsworth, 2013), this is not surprising that anger rather than disgust was found to mediate the link between values threat and moral rejection. On this basis, we explored whether anger was better at mediating the threat-behavioral intention link than global prejudice. This was not the case. Thus, although moral disgust resembles anger, it is probably not the same. Future research on prejudice linked to disgust should however differentiate between physical and moral disgust to clarify this point.

Finally, our data remain silent about the reciprocity by inability-pity-prosocial behaviors profile. It is worth mentioning that items reflecting this kind of threat were extremely difficult to formulate, even with the help provided by the authors of the model. Thus, it is possible that we failed to capture this threat. Another possibility is that the relevance of this threat depends on the cultural context. The original data were collected in the USA when this threat could be more important than in France, where the two studies were run.

To sum up, the present studies replicate basic findings of the model on the threat-emotion links (Cottrell & Neuberg, 2005) and successfully show the direct links between threats (emotions) and behavioral intentions. Regarding mediation analyses, findings only partially support the threat-emotion-behavioral intention profiles as described in the sociofunctional model. Even if the health-disgust-rejection, the safety-fear-escape, and the moral-guilt-repair profiles emerged, the obstacle-anger-aggression profile failed. This gap raises a question about the validity of the model because this profile involves the majority of the specific threats listed in the model (i.e., 6 on 11 specific threats). Thus, future research will have to check the validity of this profile, as well as the conditions that make such a profile emerge, or whether it should be considered as a theoretical mirage. Although the results of these studies are interesting by themselves, we must acknowledge that our reliance on a correlational design and on the self-reported measures limit our conclusions about the causal role of threat and the mediational role of emotions. Thus, an important next step for this research would be to more appropriately test the hypothesized causal chain by manipulating the treat and measuring actual, instead of reported, behavior.

## Notes

- <sup>1</sup> These five profiles represent prototypical reactions to perceived threat posed by outgroups. It is worth noting that secondary emotions (with the resulting emergence of secondary behavioral motivation) can also emerge when the perceived threat implies the

presence of another threat (see Cottrell & Neuberg, 2005). For instance, a threat of contamination, leading to disgust, should also imply a threat to move freely (due to potential contamination) which would induce anger (and potential aggressive tendencies) toward members of the outgroup. However, these secondary emotions are beyond the scope of this article and will not be exposed in details.

- <sup>2</sup> Anger and fear were each measured with two items. In contrast, disgust, pity, and guilt were each measured with only one item because of an error (that was corrected in Study 2).
- <sup>3</sup> We performed a principal component analysis that showed that the 12 items saturated on one unique factor explaining 70, 33% of the total variance.
- <sup>4</sup> Again, we performed a principal component analysis. Results showed that two factors emerged explaining respectively 54% and 31% of the total variance. Varimax rotation showed that 3 of the 4 items saturated on the first factor. However, one of the health items weakly saturated one this factor (.07). After exclusion of this item (see Item Health 1 in Appendix 1), one unique factor emerged explaining 68% of the total variance.
- <sup>5</sup> For each category of items, we performed a principal component analysis. For obstacle category, results revealed one main factor explaining 66% of variance (saturation coefficients > .59). For behavioral intention linked to obstacle threat, one main factor explaining 39% of variance (saturation coefficients > .32).
- <sup>6</sup> A principal component analysis performed for contamination category showed that two factors emerged explaining respectively 54% and 28% of the variance, corresponding to the threat to health and the threat to values. This was the same for behavioral intention linked to contamination threat. Results revealed two factors explaining respectively 46% (behavioral intention linked to health threat factor) and 30% of variance (behavioral intention linked to values threat factor).

## Additional File

The additional file for this article can be found as follows:

- **Appendix.** Items of perceived threats, emotions and behavioral intentions in Study 2. DOI: <https://doi.org/10.5334/irsp.169.s1>

## Competing Interests

The authors have no competing interests to declare.

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