

**Do It for Others! The Role of Family and National Group Social Belongingness in Engaging With  
COVID-19 Preventive Health Behaviors**

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### Highlights

- We studied belongingness' effect on COVID-19 preventive behavior intentions
- Closeness to family promotes preventive behavior intentions
- Closeness to family promotes both self-centered and prosocial reasons for compliance
- National identification is conditionally linked to preventive behavior intentions

### Abstract

COVID-19 is an unprecedented threat and an effective response requires a collective effort: engagement in preventive health behaviors, even from people at low risk. Previous research demonstrates that belongingness to social groups can promote prosocial, preventive health behaviors. The current research tests the effects of belongingness to two types of groups, intimate (family) and social category (nation), on intentions to comply with preventive health behaviors and reasons for these behaviors. We conducted three studies using French participants at low risk of grave effects from COVID-19 (total  $N = 875$ ). In Study 1, across three time periods, belongingness was correlated with greater intentions to comply with preventive behaviors when these behaviors were not enforced by law. In Study 2, we experimentally manipulated threat to belongingness (vs. no threat). When belongingness was threatened, participants were less concerned with protecting vulnerable people. Closeness to family predicted preventive behavior intentions and both self-centered and prosocial reasons for these behaviors, regardless of condition. National identification buffered the negative effects of the threat to belongingness condition on preventive behavior intentions. In Study 3, we experimentally primed thoughts of belongingness to family vs. nation vs. control condition. We found greater intentions to engage in preventive behaviors and greater concern with protecting oneself and close relatives in the family condition. In summary, belongingness to one's family promotes preventive behavior intentions and the reasons given are to protect both oneself and others. Self-reported (but not primed) national identification can be related to prevention behavior intentions under certain conditions.

*Key-Words:* closeness to family; COVID-19; health behavior; national identification; perceived risk

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We need each other, we are a united nation and are united and it's in this way that we will succeed. We are France. I am counting on each of you, I will be here, we will be here, and we will succeed together. (Macron, 2020)

COVID-19 is a global threat that requires solidarity from all members of society by respecting government restrictions and engaging in preventive health behaviors like mask wearing, hand washing, and avoiding crowded places. Much research in health psychology shows that risk perception is a major predictor of the adoption of preventive behaviors (e.g., Sheeran et al., 2014) and the context of COVID-19 is no exception (e.g., Prasetyo et al., 2020). However, the COVID-19 pandemic presents a paradox whereby the virus poses a direct and serious risk to only a minority of society (older individuals and those with risk factors), but a collective response, including from those who are at low risk, is required to reduce transmission, to protect health care systems and economies, and reduce the likelihood of variants developing. Thus, the important motivating factor of perceived risk to oneself cannot be the only driver of the collective response needed to curb virus transmission. For those individuals with lower risk of suffering from a severe case of COVID-19 other factors must be motivating their response. Various politicians have called on their nations to act in solidarity with their fellow citizens to defeat the virus, such as Emmanuel Macron's quote above or Boris Johnson's COVID-19 slogan "Stay home, protect the NHS, save lives." Much of the messaging has focused on depriving oneself of freedoms to be in solidarity with fellow countrymen and women or to protect vulnerable family members.

From research in social psychology, we know that feelings of belonging to a group can encourage prosocial behaviors even when these actions are costly for the individual (Baldassarri & Grossman, 2013; Baumeister & Leary, 1995). Particularly in the context of COVID-19, where the perceived risk to oneself may be low, citizens seem more inclined to act for loved ones and more broadly for others than for oneself (Sætrevik, 2020). In this research, we aim to understand how

feelings of belonging to family or national citizen groups can lead individuals who are at low risk from COVID-19 to engage with prevention behaviors. In Study 1, we examined whether belongingness to family and the nation will continue to motivate people to respect preventive measures when government rules are less strict and risk of transmission of the virus is lower. In Study 2, we examined experimentally whether under conditions of threat to belongingness, belongingness in one's family or nation could buffer the negative effects of such threat (decreased preventive and prosocial behaviors) on preventive behavior intentions. Finally, in Study 3 we tested experimentally whether activating thoughts of belongingness to family or nation could increase intentions and prosocial reasons for engagement in preventive health behaviors.

### **Belongingness and Prosocial Behaviors**

Humans are social animals, and social science findings highlight the importance of belongingness for well-being (see Baumeister & Leary, 1995; Greenaway et al., 2016). Belongingness refers to how attached an individual feels to a group (Jansen et al., 2014) and comprises both emotional (e.g., positive emotions towards the group and its members) and cognitive (e.g., perception of common identity and closeness) elements (Baumeister & Leary, 1995; Jansen et al., 2014). When individuals feel that they belong to a group, the group's goals may become their own goals (Kelley & Thibaut, 1978; Tajfel & Turner, 1979) and individuals tend to endorse group norms and be motivated to act for the benefit of their group and its members (Ellemers et al., 2002). For example, belonging to a group has been shown to promote sharing resources, even when it comes at the costs of one's own profits (Baldassarri & Grossman, 2013). Belonging can encourage helping behaviors even towards strangers if they belong to one's group (Levine et al., 2005). More importantly for the current context of COVID-19, social support as a consequence of social belonging could promote health behaviors (e.g., Godin et al., 2005) and increase attention to preventive messages (Viswanath et al., 2006). Some support has already been found for the hypothesis that activating thoughts of belonging and protecting group members can promote COVID-19 health behaviors. Everett and colleagues (2020) found that a COVID-19 health message promoting following

preventive health measures to protect family, friends, and fellow citizens was more effective at convincing people to share health messaging on social media than messages that did not draw upon the idea of social groups. Other studies on COVID-19 have found that posters highlighting the risks of infecting vulnerable people were more effective at promoting prevention behaviors (Lunn et al., 2020), as were posters highlighting the risk to spread (rather than to get) the virus (Jordan et al., 2020).

Inversely, feeling like one doesn't belong to a group can have detrimental effects on prosocial and health behaviors (Baumeister & Leary, 1995). For example, researchers have found that threat to belongingness through social exclusion decreases prosocial behaviors (Twenge et al., 2007). Furthermore, people in threat to belongingness conditions have difficulty persisting in frustrating tasks and unpleasant but healthful tasks (Baumeister et al., 2005), which is particularly relevant in the current context where prevention behaviors such as mask wearing can be frustrating or uncomfortable (Howard, 2020). Finally, threat to belongingness encourages defensiveness toward preventive health measures and avoidance of health messaging (Howell & Shepperd, 2017).

### **Belongingness to Intimate or Social Groups and Compliance with Group Goals**

One question that remains to be answered is whether the type of group one belongs to matters for influencing prosocial behavior. Four types of social groups have been delineated in work on lay theories of groups (Lickel et al., 2000). These include intimate groups such as close friends and family, social category groups such as citizens of a nation, task groups such as coworkers, and loose connections or people with whom one has infrequent social contact. In the current study we focus on intimate groups, namely family, and social category groups, namely French citizens. We chose these groups for two reasons. First, the context of stay-at-home, work-from-home, and social distancing measures meant that many people had reduced contact with task and loose connection groups. Second, government and media messaging around preventive health behaviors focused on protecting family members from COVID-19 and acting in solidarity with other citizens to defeat the virus (Lilleker et al., 2021).

While there is strong evidence for the importance of these groups in people's lives, debate exists around how to measure belongingness in different types of groups. For example, in close interpersonal relationships, the concepts of attachment and emotion tend to be subsumed into a single category of overall closeness (Aron et al., 1992; Dibble et al., 2012). Belongingness to the national group tends to be measured with identification which expands the definition but certainly includes elements of belongingness and inclusion in one's ingroup. For example, Leach and colleagues (2008) defined a multidimensional conceptualization of identification comprising emotional and cognitive components. Thus, according to Leach and colleagues, inclusion and belongingness are part of identification with one's group, even if identification goes further by considering personal investment in one's group.

While there is some debate about how belongingness in interpersonal and social category groups should be defined, there are core elements of belongingness (i.e., emotional investment and cognitive perception of proximity) that can be found in all groups and which can increase compliance with group goals (Brewer & Gardner, 1996). However, research on lay groups shows that belonging to different types of groups can have varied effects on behavior. Specifically, research comparing intimate groups and social category groups has shown that people in intimate groups tend to have more interaction and greater feeling of proximity and similarity with other group members than social category group members (Lickel et al., 2001). Intimate groups are perceived as more entitative, or cohesive, than social category groups (Lickel et al., 2000, 2001) and this may have repercussions on behavior as more tightly knit groups have a stronger influence on group norms and transforming group goals into individual goals (Kelley & Thibaut, 1978; Tajfel & Turner, 1979). Hence, intimate groups and social category groups may both increase prosocial reasons for engaging in behaviors and thus, the intentions to engage in these behaviors, although intimate groups may have a stronger impact on them than social categories.

### **The Influence of Family and Nation Belongingness on Preventive Health Behaviors and Reasons for Compliance**

Research shows that belongingness to family, an intimate social group, can promote prosocial behaviors (Kerr et al., 2003; Markiewicz et al., 2001) because members of these groups are perceived as having greater collective responsibility which may provide stronger motivations to protect group members (Lickel et al., 2003). When the group's goals become the individual's goals this may promote helping others by respecting preventive health measures specifically in order to prevent transmitting the virus to their close family (Lipkus et al., 2013; Yilmaz et al., 2006). Grzywacz and Marks (1999) point out that feeling close to one's family promotes diverse preventive health behaviors, such as going to the doctor for regular checkups and taking medications properly, through social support, family norms surrounding health, and concerns for protecting family members from negative health outcomes (e.g., grief of losing a spouse). Other research has shown the effectiveness of appealing to family belongingness to aid in smoking cessation: smokers were more likely to give up smoking when prevention messages focused on the negative outcomes for their family (e.g., spouses and children, Lipkus et al., 2013; Yilmaz et al., 2006) rather than negative outcomes to themselves.

Belonging to a social category group such as a group of national citizens has also been shown to have positive influences on health (Greenaway et al., 2015). This may be specifically true when national norms promote health behaviors, such as the campaigns by governments around the world promoting social distancing, because identifying with one's national group is a predictor of compliance with norms when they are perceived as protecting the ingroup (Falomir-Pichastor et al., 2009). Indeed, some support for this idea exists already in the context of the COVID-19 pandemic. In a multi-country, correlational study, researchers found that greater feelings of identifying with the national group were correlated with supporting public health measures (Van Bavel et al., 2020). However, the correlations reported by the authors were quite weak. We argue that this may be due to the fact that the national group is a social category and thus could be less effective than intimate groups at promoting preventive behaviors, according to the lay theories of groups (Lickel et al., 2000). Indeed, as stated above, more intimate, cohesive groups may be more effective at enhancing

prosocial behaviors, for example in the current study, compliance with preventive behaviors among a low-risk population. We expect, based on previous work, that people who have stronger feelings of belongingness to family and to a lesser extent to the national group, will express stronger intentions to engage in preventive health behaviors, specifically for prosocial reasons (i.e., particularly, to protect group members).

### **Current Research**

The current research presents three studies aiming to examine the role of belongingness in one's family or one's national group on low risk participants' willingness to engage in COVID-19 preventive health behaviors. In the first study, we measured closeness to family and national identification and willingness to comply with COVID-19 preventive measures at three times, at the beginning of the first national stay-at-home order in France and one month into the stay-at-home order, when the risk of transmission was high and preventive measures were enforced by law, and at the end of the stay-at-home order when there was no official enforcement of preventive behaviors. In the second study, we manipulated threat to belongingness (vs. no threat) and measured feeling close to family, attachment to the nation, intentions to comply with preventive behaviors and reasons for doing so (for oneself and others). In the final study we experimentally manipulated thoughts about belonging to family, nation, or no group and measured the effects of these conditions on intentions to engage in preventive behaviors and reasons for doing so.

We hypothesized that belongingness will be associated with greater intentions to comply with preventive behaviors (Studies 1, 2, and 3) as well as more prosocial (focused on other group members, close relatives or fellow citizens) reasons for complying with preventive health behaviors (Studies 2 and 3). Furthermore, we expected belongingness to family to have a greater impact than belongingness to the nation.

Data and material, as well as any supplementary information indicated in the article can be found at: [https://osf.io/azygb/?view\\_only=99b2872a37c84438915ee0c0dc0576b4](https://osf.io/azygb/?view_only=99b2872a37c84438915ee0c0dc0576b4)



### Study 1

The current study's objective was to test the link between closeness to family and national group on intentions to comply with preventive behaviors for those people at low risk from COVID-19 while also taking into account the context of COVID-19 related restrictions. We conducted this study at three points during the pandemic when the spread of the virus and the implemented measures differed. The first period of data collection took place during the first week of strict stay-at-home order in France (March 18 - March 23, 2020). At this time, the threat from COVID-19 was particularly acute, daily case rates and deaths were increasing quickly, the health system was becoming strained (CovidTracker, n.d.) and, the government implemented a stay-at-home order, a measure enforced by law, with police control and fines in case of rule breaking. The second period of data collection occurred after one month of strict confinement (April 14 - April 18, 2020), immediately following the announcement of a one-month extension of the stay-at-home order. At that time, people had been sheltering in their homes for one month, so the number of cases was beginning to decrease but risk of infection was still high. Measures were still strictly enforced by government officials. Thus, during the two first periods, people had external reasons to comply with preventive measures, as they were officially enforced and subject to fines for non-compliance. Finally, the third period of data collection started a week after the end of the stay-at-home order (May 18 - June 26, 2020). By this date, the number of cases and COVID-19 deaths had been drastically reduced in France and the risk of infection was lower. Thus, the preventive measures were relaxed, although citizens were asked to respect hygiene and social distancing measures. These changes created conditions in which we could conduct a natural experiment examining the relationship between belongingness to family and the nation and prevention behaviors at different levels of enforcement. Research on motivation has shown that harsh punishments, including financial sanctions such as those issued by the French police during the stay-at-home order, are effective at promoting prosocial behavior, although the motivation is then based on avoiding punishment rather than helping others (Tenbrunsel & Messick, 1999). In contrast, although compliance may be lower when there is no strong punishment,

compliance with prosocial behaviors (including health-related behaviors) is more internally motivated, and is based on ethical reasons such as helping and trusting others (e.g., Holmas et al., 2010; Mulder et al., 2006; Tenbrunsel & Messick, 1999). In other words, monetary sanctions such as fines are effective in promoting compliance, but this compliance is strictly driven by monetary concerns. However, when there are no sanctions, people rely more on their moral and prosocial judgments, which may be heightened when they have a sense of belonging to a group (e.g. Ellemers et al., 2002).

Taken together, we predicted that belongingness in the form of closeness to family or the national group would be associated with greater intentions to comply with preventive behavior, with a stronger effect for belongingness to family than nation. This effect may be particularly strong when enforcement was less strict and people had no legal obligation (i.e., punishment through fines) to comply with preventive measures. In this case, compliance should be related to more prosocial concerns, and could therefore be associated with social belonging.

## **Method<sup>1</sup>**

### ***Participants***

We recruited the majority of the 671 participants online by posting the questionnaire to Facebook groups associated with different French towns, universities, and political groups. Among this sample, 100 participants have been recruited using the Foulefactory crowdsourcing platform, and were paid 1€. We excluded from the analysis participants who were not French ( $n = 6$ ) and those who reported risk factors related to COVID-19 ( $n = 87$ ) who might be motivated to respect social distancing regardless of other factors due to their high-risk status. We also excluded those who reported being diagnosed with or having symptoms of COVID-19 ( $n = 62$ ) as these individuals may have adopted stronger preventive behaviors due to their contagiousness. The final sample is

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<sup>1</sup> A measure of perceived risk of death was also included. To keep our results more concise, we decided to not include this measure and to focus on risk of contamination. All exclusions and manipulations are reported.

composed of 523 people (401 women, 119 men, 3 missing), aged 18 and 75 years ( $M = 27.40$ ,  $SD = 11.83$ , 5 missing). The first time period included 186 participants, time period 2 included 175 participants and time period 3 included 162 participants. This sample allows us to detect a small effect size ( $f^2 = .02$ ) with an alpha of .05 and a power of .80 for a multiple regression analysis testing 1 predictor among 12 (main analyses), and a small effect size ( $f = .14$ ) with an alpha of .05 and a power of .80 for a one-way ANOVA with 3 groups (preliminary analyses) (G\*Power, Faul et al., 2007).

### ***Procedure***

Participants were recruited to participate in an online study, which was presented as a study on their perceptions of COVID-19. After giving consent, participants answered questions on risk perception regarding COVID-19, intention to adopt preventive behaviors, closeness to family, identification with the French people, questions regarding COVID-19 (risk factors and diagnosis), and sociodemographic information (including nationality, age, gender, political orientation).

### ***Measures***

Unless otherwise indicated, participants answered on 7-point scales ranging from 1: *Not at all*, to 7: *Very Much*.

**Intentions to Comply With Preventive Behaviors.** Participants were asked to indicate the extent to which they “intend to respect the measures of restriction and prevention (stay-at-home order [for periods 1 and 2], restrictions on social contact, barrier gestures etc. [for period 3]) for the coming weeks and months” (Marinthe et al., 2020).

**Closeness to Family.** We used the Unidimensional Relationship Closeness Scale (Dibble et al., 2012) asking participants to think about a specific member of their family and to complete a 11-item scale (e.g., “My relationship with this person is close.”),  $\alpha = .94$ . Four participants’ answers were removed because they indicated that they had thought of someone other than a family member (“people in general”, “friend”, “best friend”, and “me”).

**Identification With the Group of French People.** We measured the identification with the group of French people with 14-item scale (Leach et al., 2008) (e.g., "I feel solidarity with French people"),  $\alpha = .92$ .

**Perceived Risk of Contamination.** To control for perceived risk related to COVID-19, we measured perceived risk of contamination with two items ("What percentage of the French population could be contaminated by COVID-19 this year?"; "What is the percentage risk of you being contaminated with COVID-19 this year?") using a sliding scale ranging from 0 to 100% (Marinthe et al., 2020; from Setbon & Raude, 2010),  $r = .62, p < .001$ .

**Political Orientation.** We measured the demographic variable of political orientation with four items (e.g., "I feel close to the ideas of the right on social issues."),  $\alpha = .76$ .

For all variables, descriptive statistics and correlations for the total sample and descriptive statistics for each individual time period are presented in Table 1.

**Table 1**

*Means, Standard Deviations and Correlations of the Variables in Study 1 (N = 523)*

Variable	<i>M</i> <sub>Total</sub> ( <i>SD</i> )	<i>M</i> <sub>Period 1</sub> ( <i>SD</i> )	<i>M</i> <sub>Period 2</sub> ( <i>SD</i> )	<i>M</i> <sub>Period 3</sub> ( <i>SD</i> )	1	2	3	4	5	6
1. Closeness to family	5.65 (1.13)	5.63 (1.14)	5.69 (1.09)	5.64 (1.17)	1					
2. National identification	4.32 (1.16)	4.42 (1.11)	4.21 (1.13)	4.30 (1.23)	.18***	1				
3. Intentions to Comply With Preventive behaviors	6.17 (1.09)	6.44 (0.77)	6.42 (0.98)	5.60 (1.29)	.13**	.10*	1			
4. Perceived risk of contamination	40.55 (22.26)	45.08 (22.70)	43.35 (22.01)	32.31 (19.77)	.06	.01	.10*	1		
5. Political orientation	3.39 (1.32)	3.07 (1.28)	3.54 (1.27)	3.60 (1.35)	.03	.12**	.01	.04	1	
6. Age	27.40 (11.83)	26.63 (12.11)	24.53 (8.33)	31.37 (13.58)	.09*	.13**	-.20***	-.07	-.05	1

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

**Results**

***Preliminary Analyses***

Participants recruited in the three time periods differ in terms of gender,  $\chi^2(2) = 28.48, p < .001$ , age,  $F(2, 515) = 15.23, p < .001, \eta^2_p = .06$ , political orientation,  $F(2, 520) = 8.71, p < .001, \eta^2_p = .03$ , and perceived risk,  $F(2, 515) = 16.92, p < .001$ . Post-hoc analyses with Bonferroni adjustments showed that the perceived risk was higher in the time periods 1 and 2 than 3,  $ps < .001$ , and did not differ between time periods 1 and 2,  $p = 1.00$ . Gender, age, political orientation, and perceived risk were therefore included as covariates in the following analyses.<sup>2</sup> Levels of closeness to family,  $F(2, 516) = 0.14, p = .873, \eta^2_p = .001$ , and national identification,  $F(2, 520) = 1.54, p = .215, \eta^2_p = .01$ , did not differ between time periods.

<sup>2</sup> Results remain the same when not taking into account the control variables, cf. supplementary materials, Table S1.

***Effect of Time Periods, Closeness to Family and National Identification on Intentions to Comply With Preventive Behaviors***

For the analyses that follow, the time periods were coded in two orthogonal contrasts (see Davis, 2010) comparing time periods with higher level of risks and strict enforcement of preventive measures (i.e., Time periods 1 and 2) to the period in which preventive measures were less strict and perceived risk was lower (i.e., Time period 3). Contrast 1 (coded as period 1 = 1, period 2 = 1 and period 3 = -2) tests periods 1 and 2 (corresponding to the beginning and middle of strict stay-at-home order) against period 3 (post-stay-at-home order). Residual contrast 2 (coded as 1 = period 1, -1 = period 2, 0 = period 3) compares period 1 and period 2. We included both closeness to family and national identification in the model to be able to control for any shared variance between these groups. Thus, we ran a multiple regression analysis with age, gender, political orientation and perceived risk as control variables. The two contrasts, closeness to family, national identification and the interaction between these two belongingness variables with each of the contrasts were predictors of intentions to comply with preventive measures, cf. Table 2. All the control and independent continuous variables were standardized. The total model explained 19% of the variance in intentions to comply with preventive measures,  $F(11, 503) = 10.83, p < .001$ . Contrast 1 had a significant impact: people were more inclined to comply with preventive measures during periods 1 and 2 than 3. Although closeness to family was positively associated with intentions to engage in preventive behaviors, this effect was moderated by contrast 1. The decomposition of this interaction (see Figure 1) confirmed that the effect of closeness to family was significant in period 3,  $\beta = 0.31, t = 4.27, p < .001, \eta^2_p = .04$ , but not in periods 1 and 2,  $\beta = 0.02, t = 0.31, p = .760, \eta^2_p < .001$ . Thus, it seems that feeling closer to one's family is associated with greater intentions to comply with preventive behaviors when no external and official enforcement is present.

Similarly, national identification also had an effect, albeit weaker, interacting with time periods. National identification was linked to greater intentions to comply with preventive behaviors

in period 3,  $\beta = 0.20$ ,  $t = 2.90$ ,  $p = .004$ ,  $\eta^2_p = .02$ , but not in periods 1 and 2,  $\beta = 0.01$ ,  $t = 0.28$ ,  $p = .781$ ,  $\eta^2_p < .001$ , cf. Figure 2.

**Table 2**

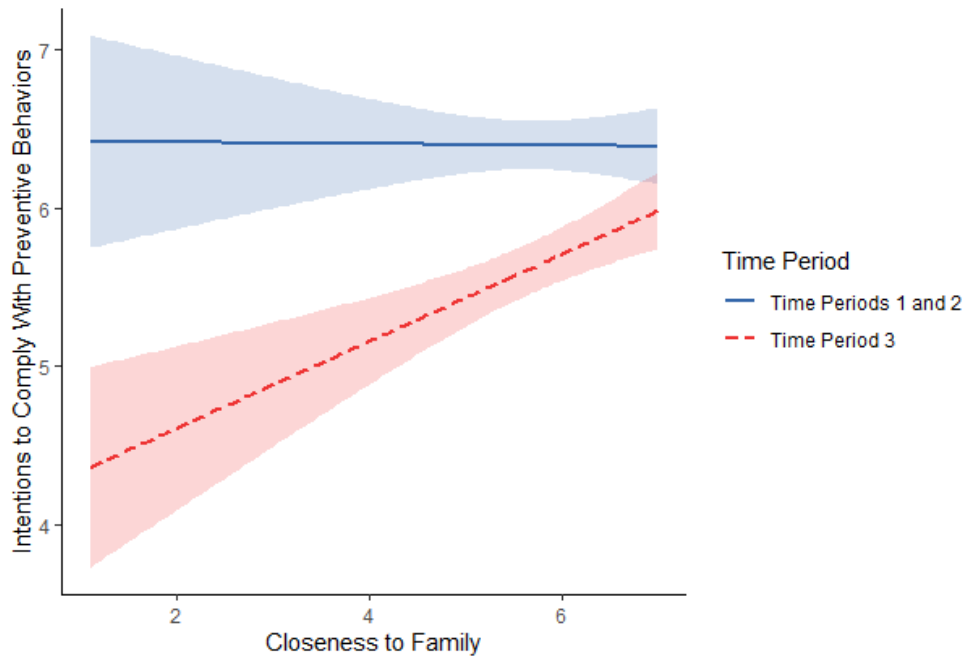
*Regression Analyses of Closeness to Family, National Identification and Time Periods on Intentions to Comply With Preventive Behaviors*

	$\beta$	$t$	$p$	95% CI		$\eta^2_p$
Gender	0.11	2.10	.036	0.01	0.21	.01
Age	0.01	0.18	.858	-0.08	0.09	< .001
Political orientation	0.08	1.85	.065	-0.01	0.16	.01
Perceived risk	-0.01	-0.25	.802	-0.10	0.07	< .001
Closeness to family	0.11**	2.70	.007	0.03	0.19	.01
National identification	0.08	1.83	.067	-0.01	0.16	.01
Contrast 1	0.25***	8.22	< .001	0.19	0.32	.12
Contrast 2	0.03	0.59	.555	-0.07	0.13	< .001
Contrast 1 x Closeness to family	-0.10**	-3.33	.001	-0.15	-0.04	.02
Contrast 2 x Closeness to family	0.02	0.32	.750	-0.08	0.12	< .001
Contrast 1 x National identification	-0.06*	-2.17	.030	-0.12	-0.01	.01
Contrast 2 x National identification	-0.09	-1.86	.064	-0.20	0.01	.01

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

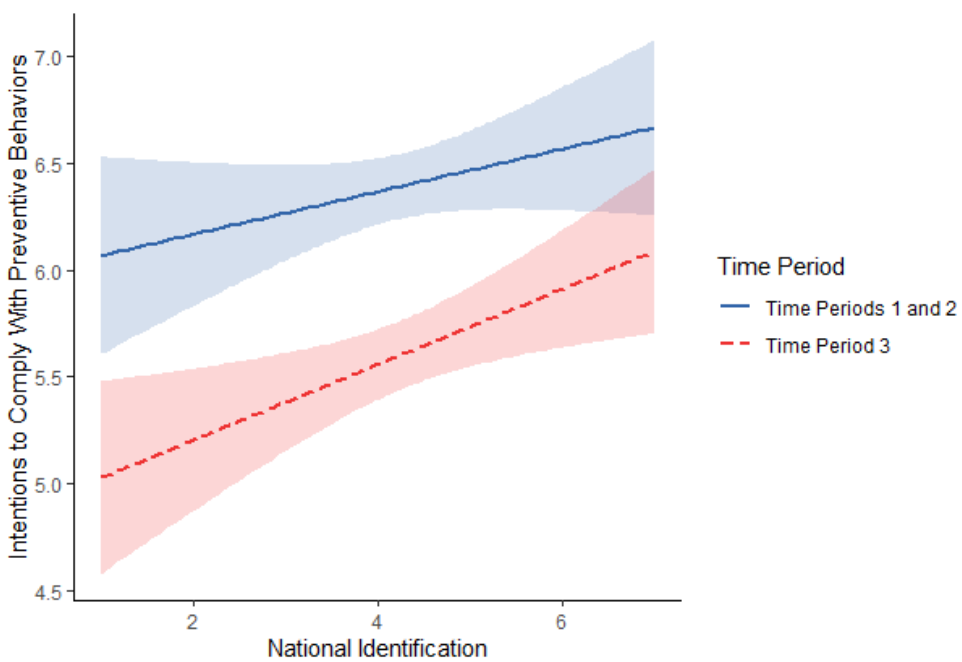
**Figure 1**

*Interaction of Closeness to Family and Time Periods on Intentions to Comply With Preventive Behaviors*



**Figure 2**

*Interaction of National Identification and Time Periods on Intentions to Comply With Preventive Behaviors*





**Intermediate Discussion**

This study supports the hypothesis that belongingness to family and, to a lesser extent, national groups, is associated with greater intentions to respect preventive measures, but only when official regulations are no longer exerting control over people's behavior. We observed that the level of intention to comply with the stay-at-home order was very high in the two first periods when government enforcement such as fines and greater risk of being infected with the virus were present, suggesting that under these conditions most people were inclined to comply. On the other hand, in period 3, when perceived risk had decreased and measures were less strictly enforced, closeness with social groups, both family and nation, was positively associated with prevention behaviors, and that this relationship was stronger for family.

As a correlational study, we cannot attest to the causality of the effect of belongingness and closeness to the family and to the national group on intentions to comply with preventive behaviors. The second study experimentally tested the implications of threat to social belongingness and closeness with the nation and family for intentions to comply with preventive behaviors. Moreover, we reflected that people may have different reasons for complying. Thus, in Study 2, we examined self-centered and prosocial reasons for engaging in preventive behaviors. Based on previous literature on belongingness we propose that identification with social groups may be more likely to activate prosocial reasons.

**Study 2<sup>3</sup>**

Study 2 aims to examine experimentally the impact of threat to belongingness on intentions to comply with preventive behaviors, while also considering the role of family closeness and national identification. Study 2 was conducted from 30 October to 2 November, 2020. At that time, France was experiencing a second wave of COVID-19 (CovidTracker, n.d.) and the government had once again issued a stay-at-home order (which was announced on 28 October and implemented on

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<sup>3</sup> Study 2 was conducted after the Study 3 reported in this paper. Study 2 was designed to reinforce the findings in Study 1 concerning belongingness by conducting an experiment and therefore, we chose to present the studies in theoretical order rather than chronological order.

October 30, 2020). However, this stay-at-home order was less strict than the first one (e.g., schools were still open) and French people were less supportive of the measure (Poussielgue, 2020). Thus, we should observe variability in levels of intention to adopt prevention behaviors. Additionally, we added measures of reasons for engaging in preventive behaviors to help us better understand the reasons for prevention behaviors. More specifically, we expect that feelings of belongingness to family and nation promote prosocial behaviors, especially in favor of one's ingroup (close relatives and fellow citizens, respectively). Finally, we measured intentions to engage in specific preventive behaviors such as wearing a mask, frequently washing one's hands, and avoiding public transportation. Study 2 was pre-registered ([https://osf.io/xzf9t/?view\\_only=115c86125d0944d1b5483f4868272419](https://osf.io/xzf9t/?view_only=115c86125d0944d1b5483f4868272419)). The analyses presented here included some deviations from the pre-registered analyses, described in supplementary materials. We manipulated the threat to belongingness (vs. no threat), hypothesizing that threat to belongingness (vs. no threat) would decrease both intentions to comply with preventive behaviors and prosocial reasons to do so. Because we expect closeness to family and national identification to enhance intentions to comply with preventive behaviors, we predict that belongingness to family and, to a lesser extent, the nation may both buffer against the negative effects of threat to belongingness on intentions and prosocial reasons to comply with preventive behaviors.

## **Method<sup>4</sup>**

### ***Participants***

We recruited 182 participants using Foulefactory crowdsourcing platform, on which participants were paid 1.50€ for their time. Eliminating participants who were not French ( $n = 1$ ), who did not correctly answer the attention check ( $n = 3$ ), who reported having risk factors regarding COVID-19 ( $n = 34$ ), or who have been diagnosed or had symptoms of COVID-19 ( $n = 10$ ) gave us a sample of 137 French people (72 women, 65 men), aged from 18 to 79 ( $M = 39.68$ ,  $SD = 13.65$ ). We

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<sup>4</sup> As in Study 1, a measure of perceived risk of death was also included in our study. All exclusions and manipulations are reported.

pre-registered a recruitment target of 165 participants (182 to allow a 10% loss) to detect a small to medium effect size ( $f = .22$ ), with an alpha of .05 and power set at .80 for an ANOVA with two groups (G\*Power, Faul et al., 2007). However, we had not anticipated the number of exclusions related to the COVID-19 criteria. Our sample ( $N = 137$ ) is therefore slightly underpowered compared to what had been planned, but allows us to detect a small to medium effect size ( $f = .24$ ) for an ANOVA with two groups (preliminary analyses) and allows for a multiple regression testing 1 predictor among 5 ( $f^2 = .06$ ), with alphas of .05 and power of .80 (main analyses).

### ***Procedure***

The study was presented as being three independent studies. The first part was presented as dealing with closeness to various social groups and participants completed closeness to family and nation measures and provided socio-demographic information. The second part was presented as a study dealing with personality. This section contained our experimental manipulation of threat to belongingness ( $n = 72$ ) vs. no threat ( $n = 65$ ). To experimentally manipulate threat to belongingness, we used the Ostracism Online paradigm (Wolf et al., 2015). Participants were told that they would meet other participants virtually and were asked to provide a brief description of themselves. Then, participants saw others' profiles (created by the researchers and the same in both conditions) for 3 minutes. They could read and react to each profile by clicking on a thumbs up button. During this time, the participants would receive likes, indicated by thumbs up below their profile and a pop up saying "You have received a like." In the threat to belongingness condition, the participants received 1 like, whereas the other profiles got between 5 and 8 likes. In the no threat condition, the participants received 6 likes and the others received between 5 and 8 likes. Participants were then asked about basic social needs and mood as a manipulation check. Finally, the last section of the study was presented as dealing with COVID-19 and included various questions about perceived risk, reason for complying and intentions to comply with preventive behaviors, as well as demographic questions.

### **Measures**

Unless otherwise indicated, participants answered on a 7-point scale ranging from 1: *Not at all*, to 7: *Very Much*.

**Measures from Study 1.** Closeness to family,  $\alpha = .96$ , identification with French people,  $\alpha = .94$ , intentions to comply with preventive behavior (referred to as intentions to comply with general preventive behaviors), perceived risk of contamination,  $r = .51$ ,  $p < .001$ , and political orientation,  $\alpha = .79$ , were measured with the same items used in Study 1.

**Basic Social Needs.** Participants completed a 12-item questionnaire adapted from the needs threat scale (Williams, 2009) which was used as a manipulation check to measure the impact of threat to belongingness on psychological needs (Fayant et al., 2014) of belonging (e.g., “I felt rejected”;  $\alpha = .95$ ), self-esteem (e.g., “I felt appreciated”;  $\alpha = .74$ ), control (e.g., “I felt powerful”;  $\alpha = .67$ ), and meaningful existence (e.g., “I felt invisible”;  $\alpha = .91$ ). Participants rated these needs based on how they felt *during the interaction* on a scale from 1: *Not at all*, to 5: *Extremely*. We used the average of these four subscales to create a general measure of fundamental needs ( $\alpha = .94$ ).

**Mood.** Participants completed a 9-item questionnaire (e.g., “I felt angry”) to assess emotions they felt *during the interaction* (van Beest et al., 2012),  $\alpha = .91$ , as a manipulation check.

**Intentions to Comply With Specific Preventive Behaviors.** Participants indicated to what extent they intend to do various recommended health behaviors in the following weeks. Prevention behaviors included avoiding shaking hands/kissing, washing hands more frequently, using alcoholic gel to clean hands, social distancing, wearing a mask indoors and outdoors, and avoiding social gatherings. All items were rated on a scale from 1 = *Never*, to 7 = *Always*. All items were averaged to create a total score of intentions to comply with specific prevention behaviors,  $\alpha = .68$ .

**Past Preventive Behaviors.** To be able to have a baseline for preventive behaviors, we measured past compliance with preventive behaviors. Two items measured past compliance, asking to what extent participants complied with “the stay-at-home order during the two months it was

implemented in France” and “the health instructions put in place following the stay-at-home order (social distancing, wearing a mask, barrier gestures, etc.) up to now”,  $r = .41, p < .001$ .

**Reasons for Complying With Preventive Behaviors.** Five reasons were proposed, introduced by the question “What are your reasons for respecting these measures?” For each reason, participants had to answer using a 7-point scale ranging from 1 = *Not at all*, to 7 = *Very Much*. The reasons were: to protect: oneself (“To protect myself from COVID-19”), one’s close relatives (“To protect my close relatives (family, friends)”), vulnerable people, (“To protect people at risk (the elderly, people with certain chronic diseases)”), French people (“To protect all French people”), humanity (“To protect humanity”) (Marinthe et al., 2020).

The means of the variables for the entire sample and for each condition, as well as the correlations between the variables in the entire sample are presented in Table 3.

**Table 3**

*Means, Standard Deviation, and Correlations of the Variables in Study 2 (N = 137)*

	<i>M</i> <sub>Total</sub> ( <i>SD</i> )	<i>M</i> <sub>Belongingness</sub> <i>Threat</i> ( <i>SD</i> )	<i>M</i> <sub>No threat</sub> ( <i>SD</i> )	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Closeness to family	5.46 (1.37)	5.49 (1.39)	5.43 (1.37)	1												
2. National identification	4.74 (1.22)	4.93 (1.13)	4.53 (1.29)	.27**	1											
3. Intentions to comply with general preventive behaviors	6.33 (0.99)	6.32 (1.11)	6.34 (0.83)	.20*	.12	1										
4. Intentions to comply with specific preventive behaviors	6.24 (0.73)	6.19 (0.80)	6.31 (0.64)	.30***	.19*	.67***	1									
5. Past preventive behaviors	6.31 (0.86)	6.30 (0.86)	6.32 (0.87)	.12	.12	.76***	.66***	1								
6. To protect oneself	6.01 (1.60)	6.11 (1.61)	5.91 (1.61)	.35***	.25**	.39***	.44***	.40***	1							
7. To protect relatives	6.64 (0.93)	6.53 (1.17)	6.75 (0.53)	.23**	.04	.27**	.38***	.22**	.45***	1						
8. To protect vulnerable people	6.70 (0.83)	6.51 (1.09)	6.91 (0.29)	.21*	.08	.33***	.38***	.28**	.38***	.63***	1					
9. To protect French people	5.91 (1.60)	5.93 (1.55)	5.89 (1.66)	.20*	.33***	.30***	.29***	.31***	.55***	.37***	.50***	1				

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10. To protect humanity	5.48 (1.97)	5.69 (1.82)	5.25 (2.11)	.18*	.28**	.31***	.24**	.27**	.50***	.28**	.35***	.82***	1			
11. Perceived risk	39.99 (20.73)	42.19 (22.29)	37.55 (18.72)	.02	.13	-.01	.05	-.06	.11	-.07	-.03	.11	.14	1		
12. Political orientation	3.64 (1.33)	3.64 (1.38)	3.64 (1.27)	.04	.05	.004	-.12	.029	-.09	-.16	-.16	-.20*	-.20*	.06	1	
13. Age	39.68 (13.65)	39.68 (13.68)	39.69 (13.73)	.07	.32***	.30***	.19*	.36***	.27**	.01	.10	.24**	.15	-.18*	.06	1

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\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

## Results

### *Manipulation Check and Preliminary Analyses*

We conducted ANOVAs (threat to belongingness vs. no threat) on the manipulation check measures (needs and mood). Needs,  $F(1,135) = 42.12, p < .001, \eta^2_p = .24$ , and mood,  $F(1,135) = 11.35, p = .001, \eta^2_p = .08$ , were both lower in the threat to belongingness (Needs:  $M = 2.77, SD = 0.77$ ; Mood:  $M = 4.67, SD = 1.00$ ) than in the no threat condition (Needs:  $M = 3.52, SD = 0.56$ ; Mood:  $M = 5.22, SD = 0.87$ ), confirming the effectiveness of the induction.

There was no difference between conditions in terms of gender,  $\chi^2(1) = 0.16, p = .734$ , age,  $F(1,135) < .001, p = .994, \eta^2_p < .001$ , political orientation,  $F(1,135) = 0.01, p = .943, \eta^2_p < .001$ , and perceived risk of contamination,  $F(1,135) = 0.69, p = .407, \eta^2_p = .01$ , thus they were not included as control variables in the analyses. Closeness to family,  $F(1,135) = 0.08, p = .785, \eta^2_p = .001$ , did not differ either between the conditions. We observed a marginal difference in the level of national identification,  $F(1,135) = 3.83, p = .052, \eta^2_p = .03$ , being higher in the threat to belongingness than in the no threat condition.

To keep results concise, we report only significant effects and their associated effects for the following analyses, but complete results can be found in supplementary materials, Table S2.

### *Moderation of Threat to Belongingness by Closeness to Family and National Identification*

**Intentions to Comply with Preventive Behaviors.** We ran multiple regression models with the conditions (coded Threat to belongingness = +1, No threat = -1), closeness with family, national identification (standardized scores) and their interaction as predictors and intentions to comply with general and specific prevention behaviors as dependent variables. We also included past compliance as a covariate to take into account participant's baseline compliance.

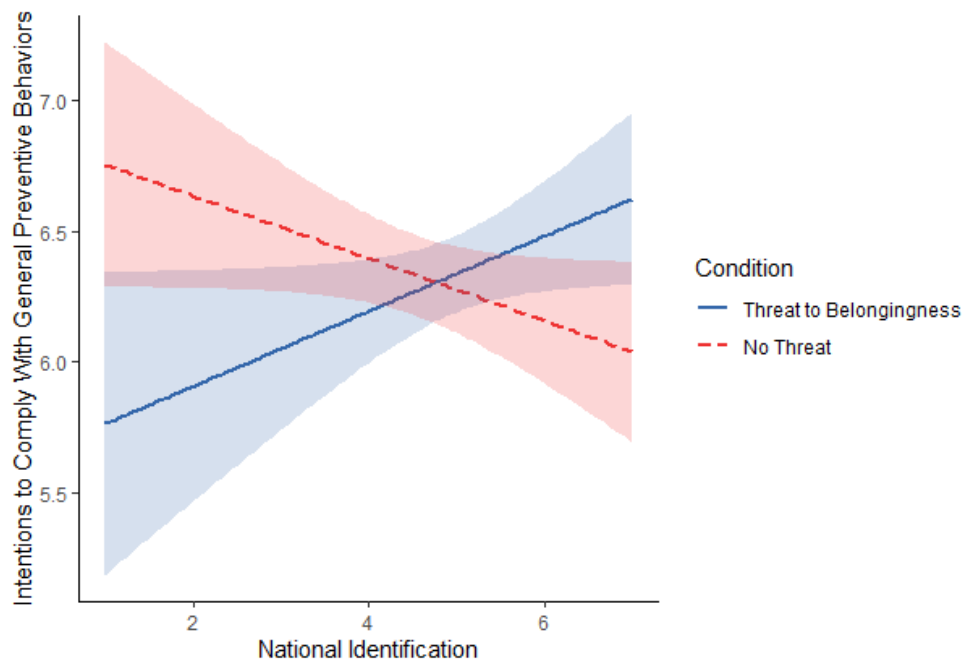
Closeness to family had a main effect on intentions to comply with specific preventive behaviors,  $\beta = 0.20, t = 3.22, p = .002, \eta^2_p = .07$ . Greater closeness to family was associated with greater intentions to comply with specific preventive behaviors.



The interaction between national identification and conditions (Threat to belongingness vs. No threat) impacted the intention to comply with both general,  $\beta = 0.16$ ,  $t = 2.72$ ,  $p = .008$ ,  $\eta^2_p = .05$ , and specific,  $\beta = 0.13$ ,  $t = 2.03$ ,  $p = .044$ ,  $\eta^2_p = .03$ , prevention behaviors. The simple effect of identification on intentions to comply with general preventive behaviors was positive under conditions of threat to belongingness,  $\beta = 0.18$ ,  $t = 1.99$ ,  $p = .048$ ,  $\eta^2_p = .03$ , and not significant under conditions of no threat,  $\beta = -0.15$ ,  $t = -1.90$ ,  $p = .061$ ,  $\eta^2_p = .03$ . Threat to belongingness led to lower intentions to comply with general preventive behaviors among low identifiers ( $-1 SD$ ),  $\beta = -0.17$ ,  $t = -2.02$ ,  $p = .046$ ,  $\eta^2_p = .03$ , but not among high identifiers ( $+1 SD$ ),  $\beta = 0.16$ ,  $t = 1.97$ ,  $p = .052$ ,  $\eta^2_p = .03$ , cf. Figure 3. Similarly, national identification had a simple effect on intentions to comply with specific preventive behaviors under threat to belongingness,  $\beta = 0.21$ ,  $t = 2.18$ ,  $p = .031$ ,  $\eta^2_p = .04$ , but not in the no threat condition,  $\beta = -0.06$ ,  $t = -0.64$ ,  $p = .527$ ,  $\eta^2_p = .003$ . Low identifiers ( $-1 SD$ ) intended less to comply with specific preventive behaviors under condition of threat to belongingness (vs. no threat),  $\beta = -0.22$ ,  $t = -2.41$ ,  $p = .018$ ,  $\eta^2_p = .04$ , but conditions had no effect among high identifiers ( $+1 SD$ ),  $\beta = 0.05$ ,  $t = 0.56$ ,  $p = .579$ ,  $\eta^2_p = .002$ , cf. Figure 4. In other words, a higher level of national identification acted as a buffer when belongingness was threatened.

### Figure 3

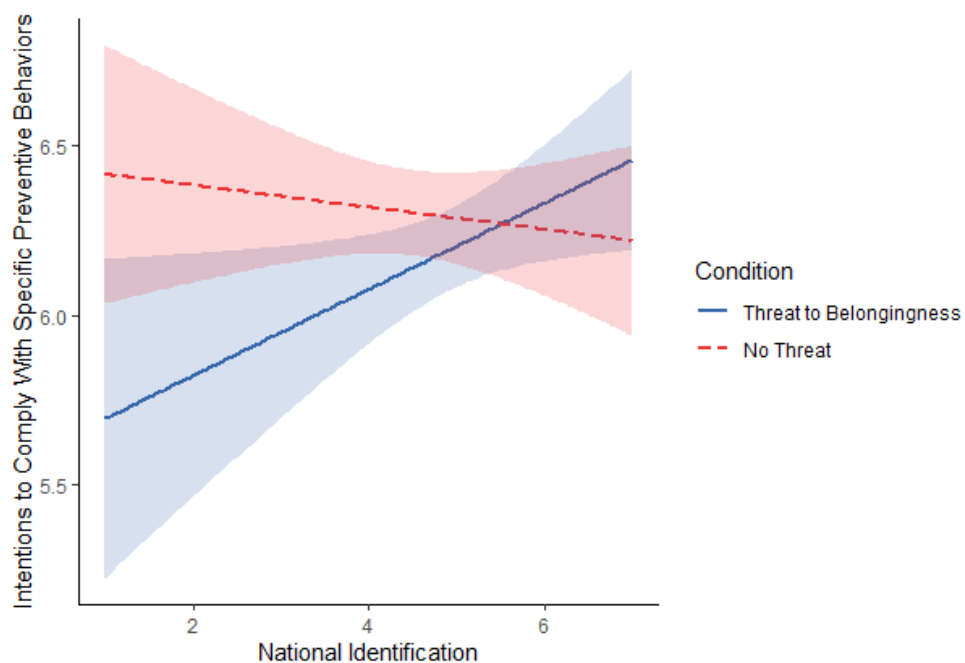
*Interaction of National Identification and Conditions (Threat to Belongingness vs. No Threat) on Intentions to Comply With General Preventive Behaviors*



**Figure 4**

*Interaction of National Identification and Conditions (Threat to Belongingness vs. No Threat) on*

*Intentions to Comply With Specific Preventive Behaviors*

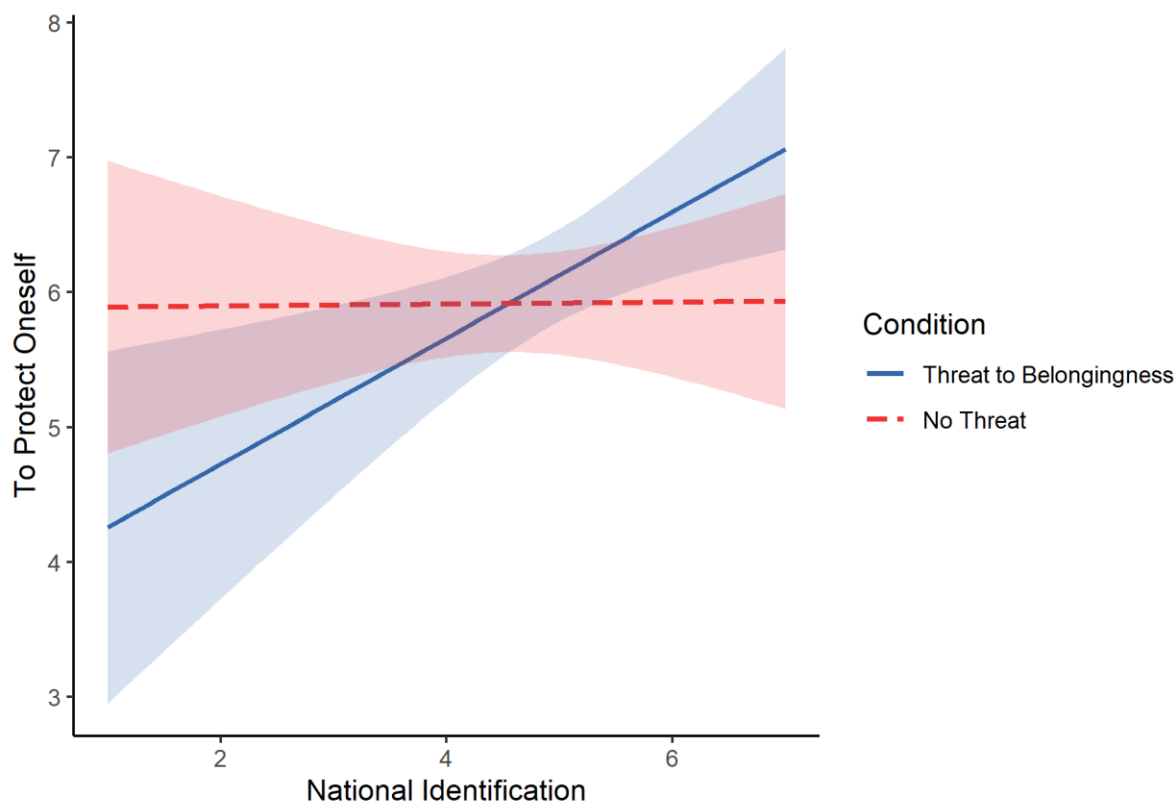


**Reasons for Compliance.** We ran multiple regression analyses with closeness to family, national identification, conditions, and their interactions, controlling for perceived risk on the five reasons, separately. These analyses showed a main effect of conditions on concerns for protecting vulnerable people,  $\beta = -0.25$ ,  $t = -3.06$ ,  $p = .003$ ,  $\eta^2_p = .07$ , with participants being less concerned with protecting vulnerable people in the threat to belongingness (vs. no threat) condition.

Moreover, closeness to family was associated with the reasons to comply to protect oneself, one's close relatives, and vulnerable people, all  $\beta$ s  $\geq 0.18$ ,  $t$ s  $\geq 2.17$ ,  $p$ s  $\leq .032$ ,  $\eta^2_p \geq .03$ . The closer individuals were to their families, the more they intended to comply with specific prevention measures, and the more they were concerned with protecting themselves and close or vulnerable others. Additionally, a main effect of national identification was observed on reasons for complying with the prevention measures to protect oneself, French people, and humanity, all  $\beta$ s  $\geq 0.18$ ,  $t$ s  $\geq 2.17$ ,  $p \leq .031$ ,  $\eta^2_p \geq .03$ . The higher the level of national identification, the more people were likely to comply to protect themselves and others French people and humans. However, the impact on being concerned with protecting oneself was moderated by the conditions,  $\beta = 0.17$ ,  $t = 2.11$ ,  $p = .037$ ,  $\eta^2_p = .03$ . National identification was linked to more concern for protecting oneself in the threat to belongingness,  $\beta = 0.36$ ,  $t = 2.88$ ,  $p = .005$ ,  $\eta^2_p = .06$ , but not in the no threat condition,  $\beta = 0.01$ ,  $t = 0.05$ ,  $p = .961$ ,  $\eta^2_p < .001$ . Conditions had no significant impact among low identifiers ( $-1 SD$ ),  $\beta = -0.14$ ,  $t = -1.23$ ,  $p = .220$ ,  $\eta^2_p = .01$ , or high identifiers ( $+1 SD$ ),  $\beta = 0.20$ ,  $t = 1.78$ ,  $p = .078$ ,  $\eta^2_p = .02$ , see Figure 5.

**Figure 5**

*Interaction of National Identification and Conditions (Threat to Belongingness vs. No Threat) on Concern for Protecting Oneself*



**Intermediate Discussion**

Study 2 confirms that belongingness to social groups plays a major role in complying with preventive measures and in one’s reasons for doing so. A minimal threat to belongingness from an unknown group led people in our study to be less motivated to protect vulnerable people from COVID-19. This study also furthers our understanding of the role of closeness to family and national identification in promoting preventive health behaviors and the reasons behind them. Closeness to family was linked to greater intentions to comply with specific behaviors and both self-centered (to protect oneself) and prosocial (to protect close relatives and vulnerable people), independent of whether participants had experienced a threat to belongingness or not. National identification played a different role. National identification was linked to greater concern for protecting French people and humanity. More importantly, people weakly identified with the nation reported lower

intentions to comply with general preventive behaviors when belongingness was threatened experimentally. However, this effect disappeared among high identifiers, suggesting that feelings of belonging with the national group buffered the effect of threat on intentions to comply. However, contrary to what we expected, national identification did not moderate the effect of threat to belongingness on prosocial reasons but only on the self-centered reason to protect oneself. This suggests that, when threatened, people do conform to recommended behaviors as a function of identification. However, at the same time, threat to belongingness activates selfish rather than prosocial motives (DeWall & Richman, 2011).

Studies 1 and 2 highlight the impact of belongingness, with minimal, family and national groups, on intentions to comply with preventive behaviors. Because belongingness is linked to more reasons and intentions to comply with behaviors aimed to tackle COVID-19, Study 3 experimentally tests if making belongingness to social groups (family and nation) more salient may promote intentions to comply with preventive measures and prosocial reasons to do so.

### **Study 3**

Study 3 took place after the first stay-at-home order (data collection started one week after the end of the stay-at-home order and lasted one month), when the lower perception of risk associated with COVID-19 and less strict governmental rules created greater variability in compliance with prevention measures. This study experimentally manipulated thoughts of belongingness to the family, to the national group and included a control condition in order to examine the effectiveness of an intervention that primes thoughts of belongingness to promote preventive behavior intentions. We predict that thoughts of belongingness to family and to the national ingroup will be associated with greater intentions to comply with prevention behaviors such as social distancing and barrier gestures and with more concern for protecting oneself and others.

### **Method<sup>5</sup>**

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<sup>5</sup> As in Studies 1 and 2, a measure of perceived risk of death was also included in our study. All exclusions and manipulations are reported.

**Participants**

We recruited 289 participants using both Facebook and the Foulefactory crowdsourcing platform, on which participants were paid 1€ for their time. We excluded from the analysis participants who were not French ( $n = 4$ ), those who reported having risk factors related to COVID-19 ( $n = 46$ ) and those who reported being diagnosed with or having symptoms of COVID-19 ( $n = 18$ ). An inspection of the responses given by participants to check for mentions of belongingness to family or nation was conducted. Thus, we excluded participants who did not correctly complete the induction task (i.e., did not write about feeling close to and happy to be a member of one's family,  $n = 4$ , or French citizens,  $n = 10$ , in the appropriate condition). The final sample is composed of 215 people (99 women, 115 men, 1 missing), aged between 18 and 71 years ( $M = 36.48$ ,  $SD = 13.58$ , 6 missing). This sample allows us to detect a low to moderate effect size ( $f = .21$ ) for a one-way ANOVA with three groups or for an ANCOVA with one control variable, with an alpha of .05 and a power of .80 (G\*Power, Faul et al., 2007).

**Procedure**

Participants were recruited to participate in an online study, which was presented as a study on perceptions of COVID-19. After giving consent, they were randomly assigned to one of three conditions: activating thoughts of belongingness to family (condition *Family*,  $n = 75$ ), activating thoughts of belongingness to the French group (condition *Nation*,  $n = 66$ ) or a condition without belongingness activation (condition *Neutral*,  $n = 74$ ). Participants were asked to read a paragraph, aimed at highlighting belongingness to the family or French people, about a survey showing that “more than 85% of the French felt close [to their family / to other French people] and said they were happy to be [a member of their family / French]”. Participants were then asked to write a paragraph on their experience of belongingness to the family or national group (complete instructions can be found in supplementary materials). In the neutral condition, participants were sent directly to answer questionnaires. All participants answered questions on risk perception regarding COVID-19, past compliance with preventive behaviors and intentions to comply with prevention behaviors in

the future, questions regarding COVID-19 (risk factors and previous diagnosis), and sociodemographic information (including nationality, age, gender, political orientation).

### **Measures**

**Measures From Studies 1 and 2.** Perceived risk of contamination,  $r = .60$ ,  $p < .001$ , intentions to comply with general preventive behaviors, the five reasons to comply with preventive behaviors, and political orientation,  $\alpha = .77$ , were measured with the same items used in Studies 1 and 2.

**Past Preventive Behaviors.** The past compliance with preventive behaviors was measured by one item ("To what extent did you comply with the stay-at-home order during the two months it was implemented?"), on a 7-points scale ranging from 1 = *Not at all*, to 7 = *Very much*.

The means of the variables for the entire sample and for each condition, as well as the correlations between the variables in the entire sample are presented in Table 4.

**Table 4**

*Means, Standard Deviation, and Correlations of the Variables in Study 3 (N = 215)*

Variable	<i>M</i> <sub>Total</sub> ( <i>SD</i> )	<i>M</i> <sub>Family</sub> ( <i>SD</i> )	<i>M</i> <sub>Nation</sub> ( <i>SD</i> )	<i>M</i> <sub>Neutral</sub> ( <i>SD</i> )	1	2	3	4	5	6	7	8	9	10
1. Intentions to comply with general preventive behaviors	5.64 (1.24)	5.91 (1.08)	5.45 (1.30)	5.53 (1.32)	1									
2. Past preventive behaviors	6.47 (0.94)	6.47 (0.91)	6.58 (0.75)	6.38 (1.12)	.32***	1								
3. To protect oneself	5.54 (1.77)	6.05 (1.22)	5.03 (2.11)	5.47 (1.78)	.58***	.29***	1							
4. To protect relatives	6.41 (1.10)	6.69 (0.64)	6.30 (1.37)	6.23 (1.17)	.50***	.38***	.57***	1						
5. To protect vulnerable people	6.41 (1.10)	6.56 (0.90)	6.45 (1.24)	6.22 (1.14)	.38***	.33***	.45***	.74***	1					
6. To protect French people	5.50 (1.58)	5.48 (1.56)	5.45 (1.75)	5.55 (1.44)	.48***	.30***	.51***	.49***	.57***	1				
7. To protect humanity	5.01 (1.91)	5.00 (1.92)	4.82 (2.05)	5.20 (1.77)	.48***	.25***	.56***	.47***	.48***	.82***	1			
8. Perceived Risk	30.82 (20.13)	32.45 (20.98)	29.78 (20.76)	30.09 (18.82)	.06	-.01	.14*	.10	.01	.04	.14*	1		
9. Political orientation	3.79 (1.38)	3.92 (1.28)	3.70 (1.50)	3.74 (1.37)	.02	-.07	.06	.01	-.11	-.02	-.16*	-.06	1	
10. Age	36.48 (13.58)	36.52 (13.97)	36.35 (13.91)	36.57 (13.07)	.02	.13	-.02	-.08	-.03	-.09	-.10	-.18**	-.04	1

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$



## Results

### *Preliminary Analyses*

The experimental condition groups did not differ in terms of age,  $F(2,206) = 0.01, p = .995, \eta^2_p < .001$ , political orientation,  $F(2,212) = 0.51, p = .603, \eta^2_p = .01$ , gender,  $\chi^2(4) = 6.30, p = .178$ , or perceived risk of contamination,  $F(2,212) = 0.38, p = .683, \eta^2_p = .004$ .

Complete results of following analyses can be found in supplementary materials, Table S3.

### *Effects of Conditions on Intentions to Comply with General Preventive Behaviors*

We conducted an ANCOVA with the three conditions as a categorical variable, and past compliance (standardized score) as a control variable on intentions to comply with preventive behaviors. The conditions had an effect on intentions to comply with preventive behaviors,  $F(2, 211) = 3.39, p = .035, \eta^2_p = .03$ . Post-hoc comparison with a Bonferroni adjustment showed that the level of intention to comply with preventive behaviors was higher in the Family than in the Nation condition,  $p = .037$ . No difference has been observed between the Family and the Neutral condition,  $p = .228$ , or the Nation and the Neutral condition,  $p = 1.00$ .

### *Effects of Conditions on Reasons for Complying With Preventive Behaviors*

We conducted ANOVAs on the five reasons to comply with preventive behaviors as dependent variables. Conditions had an effect on concern for protecting oneself,  $F(2, 212) = 6.26, p = .002, \eta^2_p = .06$ , and close relatives,  $F(2, 212) = 3.88, p = .022, \eta^2_p = .04$ . Post-hoc tests with Bonferroni adjustments showed that concern for protecting oneself was higher in the Family than in the Nation condition,  $p = .002$ , and no difference was found between Family and Neutral,  $p = .123$ , or Nation and Neutral,  $p = .393$ . Concern for protecting close relatives was higher in the Family condition than in the Neutral condition,  $p = .030$ , and no difference has been observed between Family and Nation,  $p = .104$ , or between Nation and Neutral,  $p = 1.00$ , conditions.

## Intermediate Discussion

Study 3 shows that activating thoughts of family belongingness can be effective at promoting preventive health behaviors. Indeed, participants reported greater intentions to comply

with preventive behaviors when they had thought of their family rather than of their nation. Moreover, when thinking about family, participants were more motivated to protect themselves and close relatives, confirming that priming family increases self-centered but also prosocial reasons for compliance. However, activating thoughts of national identification was not effective at increasing intentions to comply with preventive behaviors or self-centered or prosocial reasons for compliance.

### **General Discussion**

The current research aimed to test the role of social belongingness in promoting health prevention behavior intentions and the reasons for complying with these behaviors in order to reduce the spread of COVID-19 in people who are at low risk of suffering grave consequences of COVID-19. Across three studies, we found that belongingness can promote preventive health behaviors and increase both self-centered and prosocial reasons for engaging in these behaviors but that these associations depend on the type of group. Belonging to a more tightly knit, intimate group (family) versus a social category, more distant group (nation) was more effective at promoting health behaviors and concerns for protecting one's own and other's health by engaging in these behaviors.

### **Closeness to Family and Preventive Behaviors**

In the current research, we found strong correlational and experimental support for our hypothesis that greater belongingness to one's family would lead to greater intentions to engage with preventive behaviors and more prosocial reasons for these behaviors. In the natural experiment of Study 1, feelings of belongingness to the family particularly reinforced preventive behavior intentions at a time when preventive measures were not enforced by law. This result suggests that, when no other official regulations are at work, people at low risk may rely on their social groups, particularly intimate groups, to act for the group's goal and engage in preventive behaviors. This result is also found in Study 2, showing a positive link between closeness to family and intentions to engage in preventive behaviors in both situations of threat to belongingness or not. Finally, Study 3 confirmed this effect by experimentally manipulating thoughts of belongingness to family. Thus, the simple fact of thinking about belongingness to family is sufficient to increase intentions to comply

with preventive behaviors related to COVID-19. Our study adds to prior research that shows support from family leads to better health outcomes. Belongingness in one's family has been shown to be a strong predictor of adherence to medical treatments and adoption of health behaviors (e.g., DiMatteo, 2004; Grzywacz & Marks, 1999).

One mechanism which may account for this link is that belongingness to family increases normative and prosocial behaviors, leading to self-enforcement of norms concerning preventive behaviors (see Rook et al., 1990; Umberson, 1987). Indeed, in our studies, belongingness in family did motivate people to not only act for themselves, but also for others. In Study 2, closeness to family was correlated with reasons for engaging in preventive health behaviors to protect oneself, close relatives and vulnerable people. While we did not replicate all of these associations, when we experimentally manipulated thoughts of belongingness to family in Study 3, we did find that priming belongingness to family predicted greater concern for protecting close relatives and oneself. Thus, we find support for both prosocial and more self-centered reasons for engaging in preventive health behaviors related to COVID-19 when people feel greater belongingness in their family. Our findings on prosocial reasons are in line with previous literature which reports evidence for the relationships between social attachment and prosocial behaviors (e.g., Laible, 2007; Mikulincer & Shaver, 2007). Surprisingly, we found that belongingness was associated with greater concern for protecting themselves. Some studies however have found that the motivations behind health-related behaviors can never fully be separated between selfish and selfless (Hallowell et al., 2010; Lipkus et al., 2013; Yilmaz et al., 2006). This is because caring for one's individual health has knock-on effects for one's family. This is true in the case of COVID-19 as well. While people may engage in preventive behaviors to protect their family from infection, they also know that if they contract the virus, their poor health will also directly affect their family by preventing them from going to work, providing childcare, and helping with household chores. Furthermore, previous research on belongingness to family and health behaviors suggests that family members provide social support to each other that frees up time and energy (both emotional and physical) for individuals to engage in preventive

behaviors (Kaplan & Hartwell, 1987). Thus, the mixed motives we see in relation to closeness to the family, may be related to the fact that one's own health and ability to care for it is closely tied to one's family life.

### **National Identification and Preventive Behaviors**

Belongingness in a more distant group (nation) produced mixed results. Although a positive effect of national identification on subjective health and well-being has been demonstrated (Bonetto et al., 2020; Gilles et al., 2011), few studies report the implication of national identity on the adoption of preventive health behaviors. Our work highlights why such effects are infrequently observed or quite weak (Van Bavel et al., 2020). Indeed, in our studies, national identification among people at low risk reinforced intentions to comply with preventive behaviors only under certain conditions: at the beginning of the pandemic, when measures were not enforced by law (Study 1) or when individuals were faced with a threat to social belongingness (Study 2). However, we did not find evidence that priming thoughts of national belongingness is effective to promote preventive behavior intentions or prosocial or self-centered reasons for doing so.

Highlighting the national group, which is a looser and less entitative group than the family (see Hamilton et al., 2004) was not effective in engaging individuals and developing prosocial reasons (see Dovidio & Morris, 1975). Our first study highlighted that self-reported levels of national identification were linked to greater intentions to comply with preventive behaviors at the beginning of the pandemic, when measures were not enforced by law. However, this effect was not observed in Study 2 and national identification only had a buffering effect when facing threat to belongingness. At first glance, these results may seem to be in contradiction with research by Van Bavel and colleagues (2020), showing that national identification was linked to intentions to comply with COVID-19 preventive measures in 37 countries, including France. However, this study was conducted in April 2020, the same time as the third time period of our Study 1. Thus, it would appear that at the beginning of the pandemic, feelings of belongingness to the national group were a means of promoting prevention behaviors, but that this effect faded over time (e.g., in Study 2).

This may be because compliance with prevention behaviors was very strong at the beginning of the pandemic and declined thereafter (Ifop, 2020), which may have led to a change in descriptive national norms concerning preventive behaviors. Thus, people who felt most a part of the national group, likely to act on behalf of it, may have engaged in more prevention behaviors when these were normative (i.e., early in the pandemic), but this effect diminished as the pandemic progressed and perceptions of descriptive norms of adherence to prevention behaviors declined. Furthermore, Van Bavel and colleagues called for experimental testing of these effects, as well as comparison with other social groups. Our studies do show that activating thoughts related to the national group is not sufficient to stimulate engagement with preventive health behaviors, but that communication should instead focus on intimate groups, such as the family group.

Interestingly, identification with the French national group buffers the negative effects of threat to belongingness on prevention behaviors. In Study 2, national identification was related to greater intentions to comply with preventive behaviors when belongingness to a minimal group was threatened. At the same time, it was related to a more selfish reason, to protect oneself. Threat to belongingness may generate a set of paradoxical behavioral responses that can be characterized by both antisocial and prosocial tendencies (e.g., Wesselmann et al., 2015). Our results suggest that in a situation of threat to belongingness, the most identified individuals could comply with recommended behaviors that can be seen as injunctive norms, but these processes of obedience could reflect more selfish reasons to conform in order to be accepted back into society (see for example Riva et al., 2014; Williams et al., 2000). More research is needed to understand the self-focused reasons of prosocial behavior as a result of a threat to social belongingness. This is all the more important in the context of COVID-19 where situations of de facto lack of social interactions have occurred due to distancing measures and stay-at-home recommendations (Ammar et al., 2020), particularly among certain groups, such as students (Belghith et al., 2020; Elmer et al., 2020). Feelings of belongingness to the national group may therefore have played a role in the adherence

to preventive behaviors during the COVID-19 crisis, leading individuals to comply more with national norms, but this may have been accompanied with a self-centered reason, to protect themselves.

### **Limitations and Perspectives**

Despite the importance of these results, some limitations should be noted. For example, although a robust link between intentions and actual preventive behaviors in the COVID-19 context has been shown (Hagger et al., 2020), we looked at the impact of belongingness only on behavioral intentions, and therefore cannot draw conclusions about actual behavior. In addition, we measured behavioral intentions with a single-item in Studies 1 and 3. The more diversified measurement of specific behaviors in Study 2 is closer to the participants' everyday life, and may be more accurate in measuring behaviors, which may explain why we found stronger effects on this measure. Future studies should focus on a diversity of prevention behaviors in order to have a more nuanced approach to health behaviors related to COVID-19. Moreover, the effect sizes associated with our results are relatively small. However, in crisis contexts such as that of COVID-19, any intervention that can lead individuals to adopt behaviors to combat the pandemic, even if its effect is small, can play a role at the country or global level.

Future research may also examine the role of belongingness on other preventive behaviors to fight COVID-19: the intention to vaccinate and actual vaccination. Surveys indicate that young people are reluctant to be vaccinated, in particular because of the low risk of COVID-19 for them (e.g., BVA, 2020). Highlighting belongingness to family could have similar effects on willingness to vaccinate to those observed on the preventive behaviors measured in our studies, and thus be key to motivating individuals who are least at risk (i.e., young people) to be vaccinated.

### **Conclusion**

Our work outlines how belongingness can be used to combat a global threat, such as COVID-19, by leading to individual engagement in prevention behaviors. While governments regularly call for national solidarity in the face of this crisis, this strategy does not always seem to be the most

appropriate. Centering health campaigns on intimate groups, such as the family, would be a more effective way to promote the prosocial, health behaviors necessary to tackle COVID-19.

### References

- Ammar, A., Chtourou, H., Boukhris, O., Trabelsi, K., Masmoudi, L., Brach, M., Bouaziz, B., Bentlage, E., How, D., Ahmed, M., Mueller, P., Mueller, N., Hsouna, H., Aloui, A., Hammouda, O., Paineiras-Domingos, L. L., Braakman-Jansen, A., Wrede, C., Bastoni, S., ... on behalf of the ECLB-COVID19 Consortium. (2020). COVID-19 Home Confinement Negatively Impacts Social Participation and Life Satisfaction: A Worldwide Multicenter Study. *International Journal of Environmental Research and Public Health*, *17*(17), 6237.  
<https://doi.org/10.3390/ijerph17176237>
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of Other in the Self Scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, *63*(4), 596–612.  
<https://doi.org/10.1037/0022-3514.63.4.596>
- Baldassarri, D., & Grossman, G. (2013). The Effect of Group Attachment and Social Position on Prosocial Behavior. Evidence from Lab-in-the-Field Experiments. *PLOS ONE*, *8*(3), e58750.  
<https://doi.org/10.1371/journal.pone.0058750>
- Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Twenge, J. M. (2005). Social exclusion impairs self-regulation. *Journal of Personality and Social Psychology*, *88*(4), 589–604.  
<https://doi.org/10.1037/0022-3514.88.4.589>
- Baumeister, R. F., & Leary, M. R. (1995). The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation. *Psychological Bulletin*, *117*(3), 497–529.  
<https://doi.org/10.1037/0033-2909.117.3.497>
- Belghith, F., Ferry, O., Patros, T., & Tenret, É. (2020). *La vie d'étudiant-e confiné-e [Life as a confined student]*. Observatoire de la Vie Etudiante. <http://www.observatoire-national.education.fr/enquete/la-vie-detudiant-confine/>
- Bonetto, E., Delouée, S., Mahfud, Y., & Adam-Troian, J. (2020). *National Identification, A Social Cure for COVID-19? Evidence From 67 Countries* [Preprint]. PsyArXiv.  
<https://doi.org/10.31234/osf.io/294r5>



- Brewer, M. B., & Gardner, W. (1996). Who is this “We”? Levels of collective identity and self representations. *Journal of Personality and Social Psychology*, *71*(1), 83–93.  
<https://doi.org/10.1037/0022-3514.71.1.83>
- BVA. (2020). *Les Français et la vaccination contre le Covid-19 [The French and vaccination against Covid-19]*. BVA. <https://www.bva-group.com/sondages/francais-vaccination-contre-covid-19-sondage-bva-europe-1/>
- CovidTracker. (n.d.). *CovidTracker—France*. Retrieved November 27, 2020, from <https://covidtracker.fr/covidtracker-france/>
- Davis, M. J. (2010). Contrast coding in multiple regression analysis: Strengths, weaknesses, and utility of popular coding structures. *Journal of Data Science*, *8*, 61–73.
- DeWall, C. N., & Richman, S. B. (2011). Social Exclusion and the Desire to Reconnect. *Social and Personality Psychology Compass*, *5*(11), 919–932. <https://doi.org/10.1111/j.1751-9004.2011.00383.x>
- Dibble, J. L., Levine, T. R., & Park, H. S. (2012). The Unidimensional Relationship Closeness Scale (URCS): Reliability and validity evidence for a new measure of relationship closeness. *Psychological Assessment*, *24*(3), 565–572. <https://doi.org/10.1037/a0026265>
- DiMatteo, M. R. (2004). Social support and patient adherence to medical treatment: A meta-analysis. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association*, *23*(2), 207–218. <https://doi.org/10.1037/0278-6133.23.2.207>
- Dovidio, J. F., & Morris, W. N. (1975). Effects of stress and commonality of fate on helping behavior. *Journal of Personality and Social Psychology*, *31*(1), 145–149.  
<https://doi.org/10.1037/h0076236>
- Ellemers, N., Spears, R., & Doosje, B. (2002). Self and Social Identity. *Annual Review of Psychology*, *53*(1), 161–186. <https://doi.org/10.1146/annurev.psych.53.100901.135228>

- Elmer, T., Mepham, K., & Stadtfeld, C. (2020). Students under lockdown: Comparisons of students' social networks and mental health before and during the COVID-19 crisis in Switzerland. *PLOS ONE*, *15*(7), e0236337. <https://doi.org/10.1371/journal.pone.0236337>
- Everett, J. A., Colombatto, C., Chituc, V., Brady, W. J., & Crockett, M. (2020). *The effectiveness of moral messages on public health behavioral intentions during the COVID-19 pandemic* [Preprint]. PsyArXiv. <https://doi.org/10.31234/osf.io/9yqs8>
- Falomir-Pichastor, J. M., Gabarrot, F., & Mugny, G. (2009). Group motives in threatening contexts: When a loyalty conflict paradoxically reduces the influence of an anti-discrimination ingroup norm. *European Journal of Social Psychology*, *39*(2), 196–206. <https://doi.org/10.1002/ejsp.520>
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G\*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191. <https://doi.org/10.3758/BF03193146>
- Fayant, M.-P., Muller, D., Hubertus Joseph Hartgerink, C., & Lantian, A. (2014). Is Ostracism by a Despised Outgroup Really Hurtful?: A Replication and Extension of. *Social Psychology*, *45*(6), 489–494. <https://doi.org/10.1027/1864-9335/a000209>
- Gilles, I., Bangerter, A., Clémence, A., Green, E. G. T., Krings, F., Staerklé, C., & Wagner-Egger, P. (2011). Trust in medical organizations predicts pandemic (H1N1) 2009 vaccination behavior and perceived efficacy of protection measures in the Swiss public. *European Journal of Epidemiology*, *26*(3), 203–210. <https://doi.org/10.1007/s10654-011-9577-2>
- Godin, G., Côté, J., Naccache, H., Lambert, L. D., & Trottier, S. (2005). Prediction of adherence to antiretroviral therapy: A one-year longitudinal study. *AIDS Care*, *17*(4), 493–504. <https://doi.org/10.1080/09540120412331291715>
- Greenaway, K. H., Cruwys, T., Haslam, S. A., & Jetten, J. (2016). Social identities promote well-being because they satisfy global psychological needs. *European Journal of Social Psychology*, *46*(3), 294–307. <https://doi.org/10.1002/ejsp.2169>

Greenaway, K. H., Haslam, S. A., Cruwys, T., Branscombe, N. R., Ysseldyk, R., & Heldreth, C. (2015).

From “we” to “me”: Group identification enhances perceived personal control with consequences for health and well-being. *Journal of Personality and Social Psychology*, *109*(1), 53–74. <https://doi.org/10.1037/pspi0000019>

Grzywacz, Joseph G., & Marks, N. F. (1999). Family Solidarity and Health Behaviors: Evidence From the National Survey of Midlife Development in the United States. *Journal of Family Issues*, *20*(2), 243–268. <https://doi.org/10.1177/019251399020002004>

Hagger, M. S., Smith, S. R., Keech, J. J., Moyers, S. A., & Hamilton, K. (2020). Predicting Social Distancing Intention and Behavior During the COVID-19 Pandemic: An Integrated Social Cognition Model. *Annals of Behavioral Medicine*, *54*(10), 713–727. <https://doi.org/10.1093/abm/kaa073>

Hallowell, N., Cooke, S., Crawford, G., Lucassen, A., Parker, M., & Snowden, C. (2010). An investigation of patients’ motivations for their participation in genetics-related research. *Journal of Medical Ethics*, *36*(1), 37–45. <https://doi.org/10.1136/jme.2009.029264>

Hamilton, D. L., Sherman, S. J., & Rodgers, J. S. (2004). Perceiving the Groupness of Groups: Entitativity, Homogeneity, Essentialism, and Stereotypes. In V. Yzerbyt, C. M. Judd, & O. Corneille (Eds.), *The psychology of group perception: Perceived variability, entitativity, and essentialism* (pp. 39–60). Psychology Press.

Howard, M. C. (2020). Understanding face mask use to prevent coronavirus and other illnesses: Development of a multidimensional face mask perceptions scale. *British Journal of Health Psychology*, *25*(4), 912–924. <https://doi.org/10.1111/bjhp.12453>

Howell, J. L., & Shepperd, J. A. (2017). Social exclusion, self-affirmation, and health information avoidance. *Journal of Experimental Social Psychology*, *68*, 21–26. <https://doi.org/10.1016/j.jesp.2016.05.005>

Ifop. (2020). *Les Français et le reconfinement: Entre dépression et transgression [The French and reconfinement: between depression and transgression]*. Ifop.

<https://www.ifop.com/publication/les-francais-et-le-reconfinement-entre-depression-et-transgression/>

Jansen, W. S., Otten, S., Zee, K. I. van der, & Jans, L. (2014). Inclusion: Conceptualization and measurement. *European Journal of Social Psychology, 44*(4), 370–385.

<https://doi.org/10.1002/ejsp.2011>

Jordan, J., Yoeli, E., & Rand, D. (2020). *Don't get it or don't spread it? Comparing self-interested versus prosocial motivations for COVID-19 prevention behaviors* [Preprint]. PsyArXiv.

<https://doi.org/10.31234/osf.io/yuq7x>

Kaplan, R. M., & Hartwell, S. L. (1987). Differential effects of social support and social network on physiological and social outcomes in men and women with type II diabetes mellitus. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association, 6*(5), 387–398. <https://doi.org/10.1037//0278-6133.6.5.387>

Kelley, H. H., & Thibaut, J. W. (1978). *Interpersonal relations: A theory of interdependence*. Wiley.

Kerr, M. H., Beck, K., Shattuck, T. D., Kattar, C., & Uriburu, D. (2003). Family involvement, problem and prosocial behavior outcomes of Latino youth. *American Journal of Health Behavior, 27 Suppl 1*, S55-65. <https://doi.org/10.5993/ajhb.27.1.s1.6>

Laible, D. (2007). Attachment with parents and peers in late adolescence: Links with emotional competence and social behavior. *Personality and Individual Differences, 43*(5), 1185–1197. <https://doi.org/10.1016/j.paid.2007.03.010>

Leach, C. W., van Zomeren, M., Zebel, S., Vliek, M. L. W., Pennekamp, S. F., Doosje, B., Ouwerkerk, J. W., & Spears, R. (2008). Group-level self-definition and self-investment: A hierarchical (multicomponent) model of in-group identification. *Journal of Personality and Social Psychology, 95*(1), 144–165. <https://doi.org/10.1037/0022-3514.95.1.144>

Levine, M., Prosser, A., Evans, D., & Reicher, S. (2005). Identity and Emergency Intervention: How Social Group Membership and Inclusiveness of Group Boundaries Shape Helping Behavior.

*Personality and Social Psychology Bulletin*, 31(4), 443–453.

<https://doi.org/10.1177/0146167204271651>

Lickel, B., Hamilton, D. L., & Sherman, S. J. (2001). Elements of a Lay Theory of Groups: Types of Groups, Relational Styles, and the Perception of Group Entitativity. *Personality and Social Psychology Review*, 5(2), 129–140. [https://doi.org/10.1207/S15327957PSPR0502\\_4](https://doi.org/10.1207/S15327957PSPR0502_4)

Lickel, B., Hamilton, D. L., Wierzchowska, G., Lewis, A., Sherman, S. J., & Uhles, A. N. (2000). Varieties of groups and the perception of group entitativity. *Journal of Personality and Social Psychology*, 78(2), 223–246. <https://doi.org/10.1037//0022-3514.78.2.223>

Lickel, B., Schmader, T., & Hamilton, D. L. (2003). A case of collective responsibility: Who else was to blame for the Columbine high school shootings? *Personality & Social Psychology Bulletin*, 29(2), 194–204. <https://doi.org/10.1177/0146167202239045>

Lilleker, D., Coman, I. A., Gregor, M., & Novelli, E. (2021). *Political Communication and COVID-19: Governance and Rhetoric in Times of Crisis*. Routledge.

Lipkus, I. M., Ranby, K. W., Lewis, M. A., & Toll, B. (2013). Reactions to Framing of Cessation Messages: Insights From Dual-Smoker Couples. *Nicotine & Tobacco Research*, 15(12), 2022–2028. <https://doi.org/10.1093/ntr/ntt091>

Lunn, P. D., Timmons, S., Barjaková, M., Belton, C. A., Julienne, H., & Lavin, C. (2020). *Motivating social distancing during the Covid-19 pandemic: An online experiment* [Preprint]. PsyArXiv. <https://doi.org/10.31234/osf.io/x4agb>

Macron, E. (2020). *Adresse aux Français [Address to French people] [Speech by the President of the Republic]*. <https://www.elysee.fr/emmanuel-macron/2020/10/28/adresse-aux-francais-28-octobre>

Marinthe, G., Brown, G., Delouée, S., & Jolley, D. (2020). Looking out for myself: Exploring the relationship between conspiracy mentality, perceived personal risk, and COVID-19 prevention measures. *British Journal of Health Psychology*, 25(4), 957–980. <https://doi.org/10.1111/bjhp.12449>

Markiewicz, D., Doyle, A. B., & Brendgen, M. (2001). The quality of adolescents' friendships:

Associations with mothers' interpersonal relationships, attachments to parents and friends, and prosocial behaviors. *Journal of Adolescence*, *24*(4), 429–445.

<https://doi.org/10.1006/jado.2001.0374>

Mikulincer, M., & Shaver, P. R. (2007). Boosting Attachment Security to Promote Mental Health,

Prosocial Values, and Inter-Group Tolerance. *Psychological Inquiry*, *18*(3), 139–156.

<https://doi.org/10.1080/10478400701512646>

Poussielgue, G. (2020, January 11). L'exécutif face à un deuxième confinement plus compliqué que le

premier [The government is faced with a second, more complicated containment than the

first]. *Les Echos*. [https://www.lesechos.fr/politique-societe/emmanuel-macron-](https://www.lesechos.fr/politique-societe/emmanuel-macron-president/lexecutif-face-a-un-deuxieme-confinement-plus-complique-que-le-premier-1261053)

[president/lexecutif-face-a-un-deuxieme-confinement-plus-complique-que-le-premier-](https://www.lesechos.fr/politique-societe/emmanuel-macron-president/lexecutif-face-a-un-deuxieme-confinement-plus-complique-que-le-premier-1261053)

[1261053](https://www.lesechos.fr/politique-societe/emmanuel-macron-president/lexecutif-face-a-un-deuxieme-confinement-plus-complique-que-le-premier-1261053)

Prasetyo, Y. T., Castillo, A. M., Salonga, L. J., Sia, J. A., & Seneta, J. A. (2020). Factors affecting

perceived effectiveness of COVID-19 prevention measures among Filipinos during Enhanced

Community Quarantine in Luzon, Philippines: Integrating Protection Motivation Theory and

extended Theory of Planned Behavior. *International Journal of Infectious Diseases*, *99*, 312–

323. <https://doi.org/10.1016/j.ijid.2020.07.074>

Riva, P., Williams, K. D., Torstrick, A. M., & Montali, L. (2014). Orders to shoot (a camera): Effects of

ostracism on obedience. *The Journal of Social Psychology*, *154*(3), 208–216.

<https://doi.org/10.1080/00224545.2014.883354>

Rook, K. S., Thuras, P. D., & Lewis, M. A. (1990). Social control, health risk taking, and psychological

distress among the elderly. *Psychology and Aging*, *5*(3), 327–334.

<https://doi.org/10.1037/0882-7974.5.3.327>

Sætrevik, B. (2020). *Realistic expectations and prosocial behavioural intentions to the early phase of*

*the COVID-19 pandemic in the Norwegian population* [Preprint]. PsyArXiv.

<https://doi.org/10.31234/osf.io/uptyq>

- Setbon, M., & Raude, J. (2010). Factors in vaccination intention against the pandemic influenza A/H1N1. *European Journal of Public Health, 20*(5), 490–494.  
<https://doi.org/10.1093/eurpub/ckq054>
- Sheeran, P., Harris, P. R., & Epton, T. (2014). Does heightening risk appraisals change people's intentions and behavior? A meta-analysis of experimental studies. *Psychological Bulletin, 140*(2), 511–543. <https://doi.org/10.1037/a0033065>
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In S. Worchel & W. Austin (Eds.), *Psychology of intergroup relations* (pp. 7–24). Nelson-Hall Publishers.
- Twenge, J., Baumeister, R., DeWall, C., Ciarocco, N., & Bartels, J. (2007). Social Exclusion Decreases Prosocial Behavior. *Journal of Personality and Social Psychology, 92*(1), 56–66.  
<https://doi.org/10.1037/0022-3514.92.1.56>
- Umberson, D. (1987). Family Status and Health Behaviors: Social Control as a Dimension of Social Integration. *Journal of Health and Social Behavior, 28*(3), 306–319.  
<https://doi.org/10.2307/2136848>
- Van Bavel, J. J., Cichocka, A., Capraro, V., Sjøstad, H., Nezlek, J. B., Alfano, M., Azevedo, F., Cislak, A., Lockwood, P., Ross, R. M., Agadullina, E., Apps, M. A. J., Aruta, J. J. B. R., Bor, A., Crabtree, C., Cunningham, W. A., De, K., Elbaek, C. T., Ejaz, W., ... Palomäki, J. (2020). *National identity predicts public health support during a global pandemic: Results from 67 nations* [Preprint]. PsyArXiv. <https://doi.org/10.31234/osf.io/ydt95>
- van Beest, I., Carter-Sowell, A. R., van Dijk, E., & Williams, K. D. (2012). Groups being ostracized by groups: Is the pain shared, is recovery quicker, and are groups more likely to be aggressive? *Group Dynamics: Theory, Research, and Practice, 16*(4), 241–254.  
<https://doi.org/10.1037/a0030104>
- Viswanath, K., Steele, W. R., & Finnegan, J. R. (2006). Social capital and health: Civic engagement, community size, and recall of health messages. *American Journal of Public Health, 96*(8), 1456–1461. <https://doi.org/10.2105/AJPH.2003.029793>

Wesselmann, E. D., Ren, D., & Williams, K. D. (2015). Motivations for responses to ostracism.

*Frontiers in Psychology*, 6. <https://doi.org/10.3389/fpsyg.2015.00040>

Williams, K. D. (2009). Ostracism: A Temporal Need-Threat Model. In M. P. Zanna (Ed.), *Advances in*

*Experimental Social Psychology* (Vol. 41, pp. 275–314). Elsevier Academic Press.

[https://doi.org/10.1016/S0065-2601\(08\)00406-1](https://doi.org/10.1016/S0065-2601(08)00406-1)

Williams, K. D., Cheung, C. K. T., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the

Internet. *Journal of Personality and Social Psychology*, 79(5), 748–762.

<https://doi.org/10.1037/0022-3514.79.5.748>

Wolf, W., Levordashka, A., Ruff, J. R., Kraaijeveld, S., Lueckmann, J.-M., & Williams, K. D. (2015).

Ostracism Online: A social media ostracism paradigm. *Behavior Research Methods*, 47(2),

361–373. <https://doi.org/10.3758/s13428-014-0475-x>

Yilmaz, G., Karacan, C., Yöney, A., & Yilmaz, T. (2006). Brief intervention on maternal smoking: A

randomized controlled trial. *Child: Care, Health and Development*, 32(1), 73–79.

<https://doi.org/10.1111/j.1365-2214.2006.00570.x>