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# Does COVID-19 Threat Relate to Intergroup Attitudes? A Test in the UK

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**Abstract**

Social and evolutionary psychologists propose that humans have acquired an evolutionary mechanism that facilitates pathogen avoidance behaviour: the behavioural immune system (BIS). Previous studies have revealed that the BIS yields negative attitudes towards out-group members. Given the clear relevance of pathogen-avoidance psychology to individuals' reactions to the COVID-19 global pandemic, the present research examined whether attitudes towards potentially pathogenic outgroups during the pandemic would reflect the BIS. Using large-scale panel data ($N$ = 1,548) collected in May 2020 in three of the UK's devolved nations (England, Scotland, and Wales), we examined whether perceived COVID-19 threat was associated with negative attitudes towards two different national out-groups linked to the initial outbreak (Italy and China), as well as the in-group (the UK). Failing to support the BIS hypothesis, mini-meta-analyses on results from the three nations revealed that COVID-19 threat was only very weakly associated with attitude towards the UK, Italy, and China. Results suggest that implications from pathogen psychology might be more limited than previously thought and apply only to specific out-group members.

*Keywords*: COVID-19, intergroup attitudes, pathogen threat, behavioural immune system

**Public Significance Statement**

Using large-scale panel data collected during the COVID-19 pandemic (May 2020) in England, Wales, and Scotland, we examined whether perceived threat from the coronavirus would be related to intergroup attitudes towards the UK, China, and Italy. Contrary to previous studies on pathogen psychology suggesting pathogen threat should predict negative attitudes toward out-groups, we found that COVID-19 threat was only weakly related to intergroup attitudes. Our results suggest that implications from pathogen psychology might be more limited than previously thought and apply only to specific out-group members.

# Does perceived threat from COVID-19 relate to intergroup attitudes? A test in the UK

Pathogens act as a strong selection pressure (Dobson & Carper, 1996; Wolfe et al., 2007), and researchers from various disciplines have studied how they contribute to shaping social behaviours. One important area of research investigates how pathogens relate to intergroup attitudes (Ackerman et al., 2018), with studies examining individual differences in sensitivity to pathogens (e.g., Faulkner et al., 2004; Kim et al., 2016; Klavina et al., 2011) and utilising experimental manipulations of pathogen threat (e.g., Huang et al., 2011; Laakasuo et al., 2018). They revealed that experimentally-induced pathogen threat leads to more negative out-group attitudes (for a review, see Kusche & Barker, 2019) and more positive in-group attitudes (Navarrete & Fessler, 2006).

Recently, the global COVID-19 pandemic has caught scholarly attention as an opportunity to investigate whether these laboratory-studies-based findings may generalise to explain the influence of actual pathogen threat on intergroup attitudes. The present study therefore tested whether perceived threat from COVID-19 would be associated with intergroup attitudes, using large-scale panel data collected at a critical period in the United Kingdom when pathogen threat was highly salient (May 2020): much of the UK was under lockdown, hospitalisation and death numbers were rising, and vaccines had yet to be developed.

## BIS and Intergroup Attitudes

Schaller and colleagues argue that humans have acquired an evolutionary mechanism that helps them deal with pathogen threat: the Behavioural Immune System (BIS, Schaller, 2006, 2011; Schaller & Park, 2011). The BIS is supposed to detect cues of infectious diseases in the social environment and facilitate behaviour that would protect people from these diseases, such as behavioural avoidance. Since failing to identify pathogen cues leads to more

devastating outcomes than mistakenly responding to non-infectious cues (Haselton & Buss, 2000), the BIS tends to treat diverse non-infectious cues as pathogen threats and readily prompt behavioural immune responses (i.e., false positive bias; Ackerman et al., 2009; Duncan & Schaller, 2009; Miller & Maner, 2012; Park et al., 2007) – one such cue being, crucially, foreign nationality (Schaller et al., 2003).

Fincher and Thornhill (2012) argued that the BIS triggers behavioural avoidance towards others living outside of their natal area (i.e., out-group members) but also behavioural approach towards in-group members, and several studies have collated supporting evidence (e.g., Laakasuo et al., 2018; Navarrete & Fessler, 2006). First, studies show that the BIS is associated with in-group-oriented feelings and behaviours, such as increased positive in-group attitudes, conformity, and collectivism (see Imada & Mifune, 2021). Second, evidence suggests that the more sensitive individuals are to pathogens, the more negative their attitudes towards out-group members – especially immigrants (Aaroe et al., 2017; Faulkner et al., 2004; Hodson et al., 2013; Ji et al., 2019; Karinen et al., 2019; Kim et al., 2016). In addition, individuals primed with pathogen threat express more negative attitudes towards out-group members than those who are not (Huang et al., 2011; Klavina et al., 2011; Krings et al., 2012).

Despite such evidence, there is an ongoing debate on *why* the BIS fosters negative attitudes towards out-group members. On the one hand, pathogen cues encourage individuals to avoid out-group members because these are likely to carry unfamiliar pathogens, which could be fatal to contract (the "out-group avoidance" account, Bressan, 2021; Fincher & Thornhill, 2008, 2012; but see De Barra & Curtis, 2012). On the other hand, the association between negative attitudes towards immigrants and disgust sensitivity disappears when individuals are assured that immigrants would conform to local norms (the "traditional norm" account, Karinen et al., 2019). This suggests that individuals would avoid out-group members

not because they may carry unfamiliar pathogens, but rather because they may violate local norms that have been established, in part, to deal with pathogens (Aaroe et al., 2017; Murray et al., 2011). Overall, it is not yet certain whether the BIS facilitates negative attitudes towards all out-groups or particular out-groups only (Ji et al., 2019; Karinen et al., 2019).

**Pathogen Threat and COVID-19**

Given that previous studies demonstrated that pathogen threat is associated with intergroup attitudes, it is important both as a test of theory and in terms of practical implications to consider whether the threat-attitude relationship applies to individuals' responses to the global COVID-19 pandemic (Ackerman et al., 2021). While prior research leads to the prediction that COVID-19 threat would produce outgroups negative attitudes as a behavioural immune response, recent surveys have yielded conflicting results. Using panel data from Japan, Yamagata et al. (2021) found that while self-reported pathogen avoidance tendencies were negatively associated with out-group attitudes, out-group attitudes did not increase as the pandemic worsened (i.e., increase in daily new cases, implementation of stricter policies). In addition, Adam-Troian and Bagci (2021), using survey data from Turkey, suggested that COVID-19 threat was positively associated with *both* pro- and anti-refugee attitudes during the pandemic. Thus, the relationship between COVID-19 threat and intergroup attitudes deserves further scholarly investigation. Specifically, is the link between perceived COVID-19 threat and intergroup attitudes in the general population consistent with findings from laboratory studies?

In the present study, we examined attitudes towards the UK (in-group) and two national out-groups: Italy and China. Previous studies on the BIS and out-group attitudes typically investigated attitudes towards a single out-group in comparison to the in-group. However, given the controversy as to whether the BIS would treat all out-groups in the same manner or respond to specific out-groups (Kusche & Baker, 2019), it is important to

investigate the relationship between pathogen threat and attitudes towards different out-groups. We chose Italy and China because they both had very high infection and death rates at the time of data collection (May 2020) and had been identified by news providers as the source (China) and conduit (ski resorts in Italy) of the virus. They could hence be perceived as similarly dangerous in terms of pathogen threat. In addition, Italy is relatively culturally similar to the UK, whereas China is more dissimilar, notably in terms of cultural strict norms and punishments for norm deviations (Chua et al., 2019; Eriksson et al., 2021; Gelfand et al., 2011), allowing us to distinguish between the pathogen avoidance and the normative accounts: Whilst the out-group avoidance account would predict that threat should be associated with negative attitudes towards both countries, the traditional norm account predicts this relationship would exist for China but not Italy.

## Method

### Participants and Procedure

The present data was collected as part of a large-scale research project tracking social cohesion, political views, and views on COVID-19 in the UK. The surveys used for the present analyses involved representative panels from three devolved nations of the UK: Scotland, Wales, and England (more specifically the county of Kent) – hereafter referred to as "regions." An aimed sample size of roughly 500 participants from each region was determined prior to data collection based on feasibility and funding capacities and desired power to detect small effect sizes.

A total of 1,571 respondents completed the online questionnaire in May 2020 during the UK first lockdown. We excluded 23 participants who failed attention checks, resulting in $N$ = 1,548 participants ($M_{age}$ = 55.99, $SD$ = 14.80; 782 females, 764 males), including 501 English, 529 Scottish, and 518 Welsh participants. Alongside other measures that are beyond

the scope of the present paper, participants completed measures of perceived threat from COVID-19 and intergroup attitudes.

The three regions were selected to represent a variety of geographical, social, and political landscapes. We had no theoretical reason to expect that individuals in different countries would show differing patterns of out-group attitudes. Thus, following Abrams and Travaglino (2018), we separately analysed data from these regions and treated them as conceptual replications of one another. We report regional results in online appendices alongside publicly-accessible data and analysis code (https://osf.io/b2zuf/) and focus here on the meta-analyses of the effects observed in the three regions.

## Measures

### Perceived COVID-19 Threat

A single item measured perceived threat from COVID-19: "How much do you think the coronavirus poses a threat to the safety and security and/or to traditions and general way of life of people in Britain?" using a 5-point scale (1 = *Not a threat*, 5 = *Very serious threat*).

### Intergroup Attitudes

Intergroup attitudes were measured using a "feeling thermometer" (Lavrakas, 2012). Participants indicated their feelings towards the UK, China, and Italy, as well as other countries that are not key to the current research question (0° = *Very cold and unfavourable*, to 100° = *Very warm and favourable*).

### Control Variables: Demographics

Given the potential influence of demographic factors, we used the following as control variables in the analyses: gender (recoded as 0 = *Male*, 1 = *Female*), age, 7-point political orientation (1 = *Left*, 7 = *Right*), 8-point subjective status (status ladder), ethnicity (recoded as 0 = *Non-White*, 1 = *White*), and personal exposure to COVID-19, which was the sum score of three indicators: whether participants had personally contracted the virus,

whether someone close to them had contracted the virus, and whether they had personally been seriously affected by COVID-19 (0 = *No*, 1 = *Not sure*, 2 = *Yes*) – resulting in a summed score ranging 0 to 6.[1]

## Results

Table 1 summarises descriptive statistics and inter-measure correlations. For each region, we used a linear mixed model and allowed the intercept to vary between participants. We regressed attitudes on target country (within-person factor: UK vs. China vs. Italy), perceived COVID-19 threat (between-person predictor), their (cross-level) interaction, and control variables. Regression coefficients were converted into correlation coefficients to be used in the meta-analysis. We then meta-analysed the COVID-19 threat × target country interaction observed in the three regions. The meta interaction effect was significant, $r$ = .07, 95% CI [.02, .12], $p$ = .008 (Figure 1), and homogeneous across samples, Cochran's $Q$ = 0.55, $p$ = .76.

As the meta-interaction was found significant, we carried on to meta-analyse the simple slopes of COVID-19 threat on attitudes towards each target country. The overall association between COVID-19 threat and attitude towards the UK (in-group attitude) was only marginally significant, $r$ = .05, 95% CI [.00, .10], $p$ = .067, and homogeneous across samples, Cochran's $Q$ = 1.06, $p$ = .59. We found a small and significant overall association between COVID-19 threat and attitude towards China, $r$ = -.06, 95% CI [-.11, -.01], $p$ = .02, homogeneously across samples, Cochran's $Q$ = 1.49, $p$ = .47. Turning to attitudes towards Italy, results showed a non-significant overall association with COVID-19 threat, $r$ = .04, 95% CI [-.01, .08], $p$ = .167, again homogeneously across samples, Cochran's $Q$ = 1.22, $p$ = .54. In sum, results indicated fairly weak relationships between perceived threat from

[1] One could wonder whether an exposure index relying solely on contracting the virus (i.e., the first two items) would be a more relevant covariate (i.e., focusing on the first two items and discarding the measure of being affected in other ways). It can be noted that results remain unchanged in terms of coefficients, *p*-values, and effect sizes, whether the 2- or 3-item exposure index is used as covariate.

COVID-19 and intergroup attitudes: the link was only marginal for the ingroup (UK), nonsignificant for Italy, and significant but fairly small for China.

**Table 1**

*Descriptive statistics and correlations for the overall sample (*N *= 1,548)*

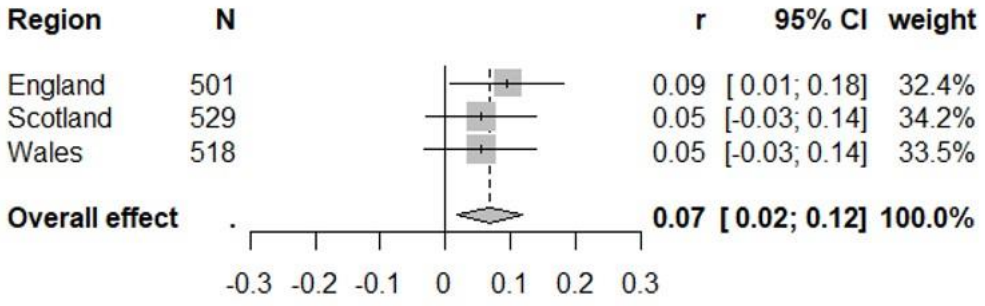
| | | | Pearson's correlations | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *M* (*SD*) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | Attitude towards UK | 71.94 (22.03) | - | | | | | | |
| 2 | Attitude towards China | 42.69 (27.33) | .12*** | - | | | | | |
| 3 | Attitude towards Italy | 65.21 (21.57) | .42*** | .41*** | - | | | | |
| 4 | COVID-19 threat | 4.40 (0.91) | .05* | -.04 | .05* | - | | | |
| 5 | Political orientation | 4.02 (1.36) | .21*** | -.30*** | -.11*** | -.05 | - | | |
| 6 | Age | 55.99 (14.80) | .10*** | -.08 | .01 | .06* | .15*** | - | |
| 7 | Exposure to COVID-19 | 0.83 (1.57) | -.01 | .05 | .05* | .05 | -.05* | -.06* | - |
| 8 | Subjective status | 4.33 (1.34) | .13*** | -.002 | .12*** | .02 | .10*** | .24*** | .01 |

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

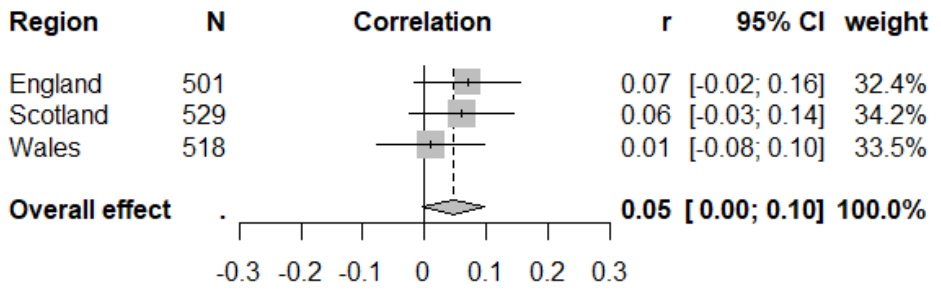
**Figure 1**

*Forest plot of the associations between COVID-19 threat and intergroup attitudes: (a) COVID-19 Threat × Target Country interaction, and simple slopes of attitudes towards (b) the UK, (c) China, and (d) Italy*

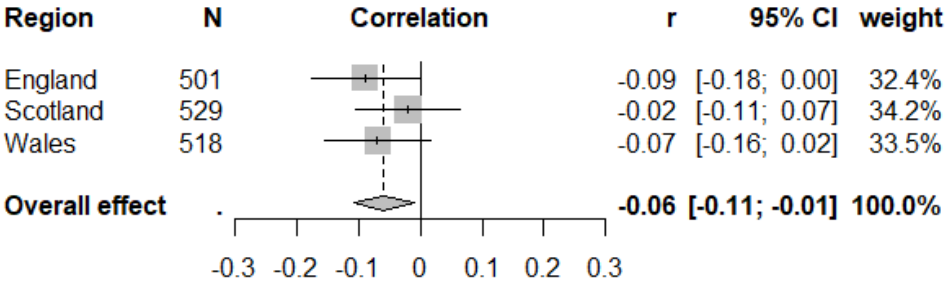
**(a)**



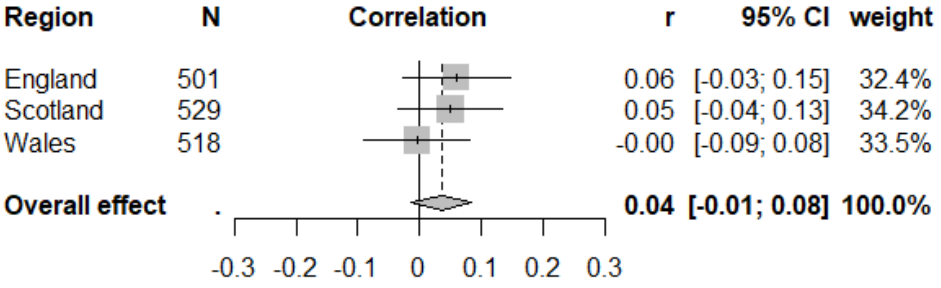
**(b) Attitudes towards the UK**




**(c) Attitudes towards China**




**(d) Attitudes towards Italy**




## Discussion

We examined here whether and how COVID-19 threat was associated with intergroup attitudes in the UK. We did not find evidence that COVID-19 threat was associated with in-group attitude nor attitude towards Italy. Yet, we did detect a weak negative relationship between COVID-19 threat and attitude towards China. These differential results are more

consistent with the norm violation account (Karinen et al., 2019) than the out-group avoidance account (Fincher & Thornhill, 2008, 2012).

Our meta-analyses, overall, provided little evidence that COVID-19 threat is meaningfully associated with in-group attitudes. Imada and Mifune (2021) suggested that fear of contracting a disease might not necessarily be relevant to in-group attitudes. They argue that pathogen stress had shaped in-group-oriented attitudes because this would help individuals acquire social support when they are sick and in need of support. In other words, the BIS would foster positive in-group attitudes as a reactive immune response against pathogen *infections* but not against pathogen *threat* per se. It is therefore less surprising that perceived threat of COVID-19 was unrelated to in-group attitudes.

Perceived COVID-19 threat was also barely associated with attitudes towards two out-groups, conflicting with previous findings on the BIS and intergroup attitudes (e.g., Fincher & Thornhil, 2012; Kusche & Baker, 2019). However, the null results could be attributed to the nature of our measure of attitudes, which focused on out-*groups* rather than immigrants or out-group *members* themselves. Although countries with high COVID-19 infection rates could be perceived as sources of pathogen infection, it is the members of these countries who could bring and expose the in-group to COVID-19. Future studies might need to investigate attitudes towards Italian and Chinese people instead of Italy and China. That being said, our results did reveal a stronger association with attitudes towards China than Italy, suggesting that respondents still made a difference between target countries. In line with this view, recent research finds that interpersonal value (i.e., how much we have in common and appreciate a person) is used as a cue for tolerating infection-risky interactions (Tybur et al., 2020). While China is culturally more different from the UK than Italy is, recent findings suggest that COVID-19 might have increased the perceived infectiousness of the out-group of Asian people in particular (Makhanova, 2022). An alternative explanation

might hence be that Italy and China differed, for our participants, not just in terms of cultural similarity but also in terms of actual infectious risk.

Our single-item measure of threat, potentially conflating a variety of threats such as pathogen and economic threat, might also have been suboptimal, blurring the strength of the relationship between the BIS and out-group attitudes. It is also a less narrow measure than the infection threats discussed in most classic BIS literature, a distinction that might be responsible for some differences in the results observed. That being said, at the time of data collection media coverage and people's perception of the consequences from the pandemic were rather intertwined, with health aspects completely mixed with economic and even more symbolic aspects. In other words, perception of one type of threat was likely very much connected to perceptions of other threats (see https://osf.io/b2zuf/ for additional data on this point). We are hence confident that our measure, albeit not perfect, was still suitable to apprehend perceived threat from COVID-19. Still, future studies might want to employ items that can better distinguish between different types of threats and directly measure pathogen-specific threat perception, to potentially reveal stronger association between COVID-19 threat and intergroup attitudes.

Methodological considerations put aside, our results could also suggest that pathogen threat is not associated with attitude towards out-groups after all, which is in line with recent theorising that it might not be out-group membership *per se* that is related to the BIS (Bressan, 2021; van Leeuwen & Petersen, 2017). Previous studies on the BIS and out-group attitudes have found associations between pathogen threat and negative out-group attitudes, but these studies predominantly focused on attitudes towards immigrants. Immigrants by definition live within the in-group and, as such, differ from out-group members who are assumed to live outside of the in-group natal area (Fincher & Thornhill, 2012). According to both the out-group avoidance and norm violation accounts, individuals would hold negative

attitudes towards out-group members present in the in-group (i.e., immigrants) more strongly than they would towards completely out-group members. Indeed, individuals can easily encounter immigrants who might possess dangerous pathogens and, assuming that they expect immigrants to be unlikely to follow in-group norms, immigrants would appear dangerous for controlling pathogen prevalence in the in-group. It might also be worth distinguishing recently arrived and already-settled immigrants. Both the norm violation account and positive intergroup contact theory suggest that well-settled immigrants would trigger less negative attitudes, either because they demonstrate conformity with ingroup norms and/or because of repeated instances of positive contact.

Overall, our research suggested that perceived threat from COVID-19 was barely associated with intergroup attitude. Our findings call for the careful examination of towards which out-groups the BIS would promote negative attitude.

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