

RESEARCH ARTICLE

Solidarity Matters: Prototypicality and Minority and Majority Adherence to National COVID-19 Health Advice

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The effectiveness of measures introduced to minimise the spread of Severe Acute Respiratory Syndrome CoronaVirus 2 (SARS-CoV-2 or COVID-19) depends on compliance from all members of society. The Irish response to COVID-19 has been framed as a collective effort, fostering national solidarity. However, dominant representations of the national community often unreflexively reaffirm the prototypicality of majority group members, implicitly marginalizing minority group members. This may have implications for adherence behaviours. We propose that majority/minority membership of the national community predicts adherence to COVID-19 health advice via prototypicality and national solidarity. In Study 1, we collected data online from Irish residents ($N = 1,185$) during the first wave of restrictions in Ireland's response. In Study 2, we collected data from Irish residents ($N = 537$) during the second wave of restrictions, with more targeted sampling of minority groups. Based on these two studies, there is no difference between minority and majority group members' adherence behaviours. However, mediation analysis showed that greater adherence to COVID-19 health advice is shown when group members perceive themselves to be prototypical of the Irish national community, and thereby show greater national solidarity. In Study 3, we manipulated an appeal to adhere to restrictions ($N = 689$) and show that an inclusive solidarity appeal increased reported intentions to adhere to COVID-19 restrictions compared to an exclusive solidarity appeal among minority group members. These findings suggest that appeals to national solidarity in response to COVID-19 will be most successful when they reference the diversity of the nation.

Keywords: COVID-19; health advice; group membership; prototypicality; national solidarity

Until, and even after, vaccines are widely available, flattening the curve by slowing exposure to the Severe Acute Respiratory Syndrome CoronaVirus 2 (SARS-CoV-2 or COVID-19) is considered the most important challenge in the management of this pandemic nationally and internationally. Models suggest that without measures to control the spread of the virus, up to 81% of a population will be infected (Ferguson et al. 2020). Although the pandemic is clearly a global crisis, the management of this crisis is mainly being tackled at a national level (WHO 2020). For instance, health care systems, as well as restrictions to combat the spread of the virus, often operate at the level of

individual countries (Thu et al. 2020). This approach often plays to a sense of 'nation' and national community. In this paper, we question first, whether a reliance on a national frame of reference promotes adherence to public health measures, and second, whether an exclusive national frame of reference may inadvertently undermine solidarity in those minoritised within the national community.

From the first days of this pandemic, the refrain from the World Health Organization has been: all people need to act together. Available research makes it clear that a strong sense of being 'in it together' is linked to increased behavioural adherence to public health advice (Haslam et al., 2018). Non-pharmaceutical interventions like physical distancing, hand hygiene, ventilation and staying at home are some of the few methods currently available to decrease the spread of COVID-19. Vaccination is also now an option for some. Therefore, behaviour is of central importance to combatting this virus; and enacting behaviour to protect others is more likely where people believe they are acting in solidarity with in-group members (Reicher & Haslam 2010). Indeed, a recent 'call for action' has highlighted the need to prioritise further

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research on solidarity to inform public health advice on COVID-19 (Holmes et al., 2020) The present paper aims to work towards this call.

Despite the public health emphasis on solidarity and ‘being in it together’, research shows that not all groups are at equal risk of COVID-19. In Ireland and elsewhere, the impact of COVID-19 has been linked to minority group membership. Ethnic minorities, and economically disadvantaged migrants, are affected by the disease at a greater rate than the general population (Atchinson et al. 2020); in part because of the material circumstances of their lives. For example, for individuals who live in overcrowded conditions, work in low-paid retail, have no private transport, and are employed in social care work, adhering to guidelines may be impossible (Wright, Steptoe & Fancourt 2020). They are less likely to be able to work from home and often are at greater risk of exposure to the virus (Chung et al. 2020). Whilst some minorities may have poor health literacy (Marmot 2001), in Ireland as across the EU, migrant and minority groups are also educated health professionals that contribute significantly to the health service. For these reasons, majority/minority group membership is likely to be linked to engagement with public health advice in a complex and nuanced way. In this paper we explore the impact of minority/majority group membership on perceived national prototypicality, national solidarity, and adherence to public health advice.

COVID-19 & The Relevance of the Nation

Historically, national identities have often been central to solidarity across ethnic, linguistic, and religious boundaries (Schnapper 2002). Even though national communities are increasingly diverse, Billig (1995) argues that nations retain and communicate assumed characteristics. In official communications, TV, and media, the characteristics of ethno-religious and linguistic majorities are routinely banally reproduced (Billig 1995). In this context—one of heterogeneity and difference—the national community can be said to be imagined (Wright, 2011), and our entitlement to assume a position within that community is linked to dominant representations of the national group (Stevenson & Muldoon 2010). Over the course of the current pandemic, national leaders within Ireland as elsewhere have invoked this sense of national solidarity (Kennelly et al., 2020) in public messaging.

Whilst characteristics of the national community may be banally reproduced to good effect, they may also have inadvertent consequences. In Ireland, where this study was undertaken, the nation is an increasingly heterogeneous place. There are new and old divisions with significant multilingual migrant communities from EU and non-EU states, alongside longstanding, and very different, minority groups from the Travelling community and Protestant religions (Central Statistics Office 2012). Ireland is not unusual in this regard. Across Europe, and around the globe, populations are increasingly diverse in terms of national allegiance and citizenship (International Organization for Migration 2020). Banal reference to national history, characteristics, or culture may reaffirm, in an unremarkable

and unnoticeable way, the majority position for majority group members (Stevenson & Muldoon 2010).

The majority in Ireland, those who control popular discourse, are educated, middle class, White, Christian, and English-speaking (Guillaumond 2016). They are also engaged and reliant on Irish media sources and have a good knowledge of the Irish language and cultural practices (Stevenson & Muldoon 2010). One important way in which the national community is invoked is through the use of language. The use of English and Irish, the two official languages in Ireland, to invoke adherence to health behaviours may hinder adherence in migrants who have limited English. Equally, the use of the Irish language to support restrictions usefully invokes ‘Irishness’ and is understandable to the majority but is not likely to be understood by migrants. For example, one initiative supported by An Garda Síochána (the national police service) to encourage people to stay at home was called ‘Operation Fanacht’, meaning Operation Stay. These types of references can inadvertently communicate to peripheral groups that they hold a minority position within the nation (Joyce et al. 2013).

Members of majority and minority groups generally differ in perceived similarity to a national prototype. According to the ingroup projection model (Wenzel et al., 2008), this perceived prototypicality drives identification with superordinate groups such as the national ingroup. Collective solidarity is also a central aspect of ingroup identification (Leach et al. 2008; Postmes et al. 2013). Whilst authors disagree about their relationship to identification, all agree that solidarity and prototypicality are distinct concepts (Leach et al 2008; Postmes et al., 2013). Postmes and colleagues (2013) have suggested that perceived prototypicality may rather be considered an antecedent of solidarity than a core aspect of ingroup identification. Therefore, we hypothesise that those who share majority attributes, and are characterised as majority group members of the national community, are also more likely to feel prototypically Irish than those outside the majority group. In turn, those who perceive themselves as prototypically Irish will also feel more solidarity, which in turn facilitates adherence to the respective behavioural norm. In other words, we hypothesise that national prototypicality and national solidarity are key mechanisms that link minority and majorities’ adherence behaviours.

Empirical Approach

We present three studies that examine the mechanisms linking majority/minority membership of the national community with adherence to public health advice in Ireland. Specifically, we predicted that perceived prototypicality explains a portion of variance in adherence behaviours via national solidarity (see pre-registration of hypothesis 3 as part of a larger project; https://osf.io/ftdwr/?view_only=aa558ac6b9ce4c7c84219d89349a440f). In our first study, we present data collected online during the first wave of the lockdown in Ireland’s response to the COVID-19 pandemic. This first sample, though large, was disproportionately majority group members. Our second study was conducted during the second wave of restrictions. In

addition to sampling majority group members, targeted sampling of minority members of the national community was undertaken to ensure substantial representation of minority group members. This allowed us to examine the impact of majority/minority group membership on adherence via national group prototypicality and national solidarity. In our third and final study, we experimentally manipulated an appeal to adhere to restrictions, to examine the impact of an inclusive vs. exclusive solidarity appeal on adherence amongst majority and minority University students. This group was chosen because students received considerable negative media attention for violating the COVID-19 restrictions during a trying four-month national lockdown in 2021.

Study 1

Context

The first confirmed COVID-19 case on the Island of Ireland was on February 27th, 2020, and just under two weeks later, March 10th, 2020, the first death. In the Republic of Ireland, the Irish government responded to the pandemic with partial lockdown by March 13th when many businesses, public buildings and all education facilities closed. However, by March 24th all non-essential businesses were closed in the Republic of Ireland. At this time, all health services were made public and comprehensive emergency support payments for employers and employees were implemented. The Irish Government made further public health recommendations aimed at flattening the curve in their National Action Plan. These included: increasing hand hygiene; avoiding personal contact with people outside of one's household; staying within two kilometres of one's household when going out for brief exercise; only going out for essential purposes, such as grocery shopping and medicines. These measures were in place until the 18th of May, 2020.

Methods

Participants

In total, 1,800 participants residing in the Republic of Ireland completed an online survey, presented on Qualtrics, from the 7th to the 15th of April, 2020, less than one month after the Irish Government made recommendations in line with their National Action Plan to flatten the curve in response to COVID-19. We shared the link to this survey on various social media platforms, including Facebook and Twitter, to attract as many participants as possible. Only participants who fully completed the measures for the present research question were included in the analyses. This resulted in a sample of 1,184 participants ($M_{age} = 38.66$, $SD = 14.63$, range 18–79 years) with 937 women, 240 men, three participants identified as non-binary, one as transgender, and four who opted not to disclose their gender.

Majority/minority group status

We assessed majority/minority group status with three items: 'please indicate your national group of origin', 'are you resident in your country of origin', and 'what is your ethnic background'. Responses to each of these items were considered together in order to convert these into

one dichotomous variable to present minority or majority status. Scores were assigned based on two values, 1 = majority, and 0 = minority. For example, if a participant reported their national group of origin as German, that they were not resident in their country of origin, but now living in Ireland, and their ethnic background was white other, they were assigned a score of 0 (i.e. minority group member). In total, 984 participants identified as majority group members, and 200 reported being minority group members.

Materials and Procedure

The study complied with the ethical standards of the Declaration of Helsinki, including notifying participants that the study was voluntary, that they were free to withdraw at any time, and that they would indicate their informed consent by selecting the 'agree to take part' button to start the survey. The survey included several measures (for the full survey see https://osf.io/y64gs/?view_only=1778d8bde8614aca818f90e1c60891b6), here we describe the measures that are relevant for the present research question. These measures were assessed in the reported order.

Adherence to COVID-19 health advice

Health behaviours to prevent the spread of the virus were assessed by nine items adapted from previous research assessing protective behaviours during the SARS pandemic (e.g. Brug et al., 2004; Cheng & Ng 2006). Behaviours included handwashing, physical distancing from friends and family outside your household, and physical distancing in public (sample item: 'I have avoided personal contact with people outside of my household'). Items were rated on a seven-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). Participants were instructed that the questions were to be answered in relation to the actions they had taken prior to answering the survey. Higher scores indicated higher engagement with the behaviours. One item (wearing a mask in public) decreased internal consistency from Cronbach's alpha = 0.60 to 0.52. Admittedly, wearing a face mask was not officially advised at that stage in Ireland, and first became mandatory on public transport in July 2020. Therefore, we excluded that item and averaged the remaining eight items to form the adherence to COVID-19 health advice scale.¹

Prototypicality

We assessed national group prototypicality using the three-item individual self-stereotyping scale (Leach et al., 2008; Roth & Mazziotta 2015; e.g. 'I am a typical member of the national community', 1 = *strongly disagree*, 7 = *strongly agree*, Cronbach's $\alpha = 0.92$). Items were averaged to compute mean scores, with higher scores indicating stronger perceived national group prototypicality.

National solidarity

We assessed national solidarity with three-items (Leach et al., 2008; e.g. 'I feel solidarity with the national community', 1 = *strongly disagree*, 7 = *strongly agree*, Cronbach's $\alpha = 0.91$). Items were averaged to compute mean scores, with higher scores indicating stronger national solidarity.

Design

The study had a cross-sectional and correlational design. We pre-registered the mediation hypothesis that prototypicality would affect adherence via national solidarity. A sequential mediation was the best test of our present hypothesis. Therefore, we focus our report on the sequential mediation including majority/minority group status as the independent variable (X). The preregistered indirect effect of prototypicality (M1) on adherence (Y) via national solidarity (M2) was significant in both, Study 1 and in Study 2. It also held true in the minority as well as the majority status group in both studies (see supplemental: https://osf.io/y64gs/?view_only=1778d8bde8614aca818f90e1c60891b6).

Based on the final sample size, an alpha value of 0.05, and 80% power, sensitivity analysis using G*Power (Faul et al., 2007) indicated sensitivity to detect small effects ($f = 0.008$).

Results and Discussion

Approach to Analysis

All data were exported from Qualtrics into SPSS for analysis. Preliminary checks were conducted for skewness and kurtosis, these indicated that the main study variables

were normally distributed. **Table 1** displays means, standard deviations, and bivariate correlations between majority/minority group status, prototypicality, national solidarity, and adherence to COVID-19 health advice. To this end, path analysis was conducted using PROCESS Model 6 (Hayes 2013), using 10,000 bias-corrected bootstrap samples to estimate an indirect effect. Specifically, the model tested the path detailed in the introduction, i.e., majority/minority group status, prototypicality, national solidarity, and adherence to COVID-19 health advice,² as displayed in **Figure 1**.

Indirect Effect of Majority/Minority Group Status on Adherence to COVID-19 Health Advice

Sequential mediation analysis demonstrated that the predicted indirect effect of majority/minority group status on adherence via prototypicality and national solidarity was significant, $b = 0.03$, $SE = 0.01$, 95% CI [0.01, 0.05].³ In other words, the pathway from prototypicality to solidarity accounted for a significant portion of the effect of group membership on adherence. The combination of these variables accounted for 2% of the variance in adherence to COVID-19 health advice, $R^2 = 0.02$, $F(3, 1180) = 5.46$, $p < 0.001$. The effect of majority/minority group status

Table 1: Means, standard deviations and correlations for all Study 1 variables.

	Maj	Min	M (SD)	1	2	3	4
Group status	–	–	0.84 (.37)	–	0.22**	0.17**	0.06*
Prototypicality	5.12	4.40	4.99 (1.20)		–	0.60**	0.09**
National solidarity	5.67	5.14	5.57 (1.10)			–	0.13**
Adherence	6.21	6.09	6.19 (0.78)				–

Notes. Group status refers to Majority and Minority and does not necessarily imply any hierarchical relationship between the groups. Maj = Majority, Min = Minority. * $p < 0.05$, ** $p < 0.01$.

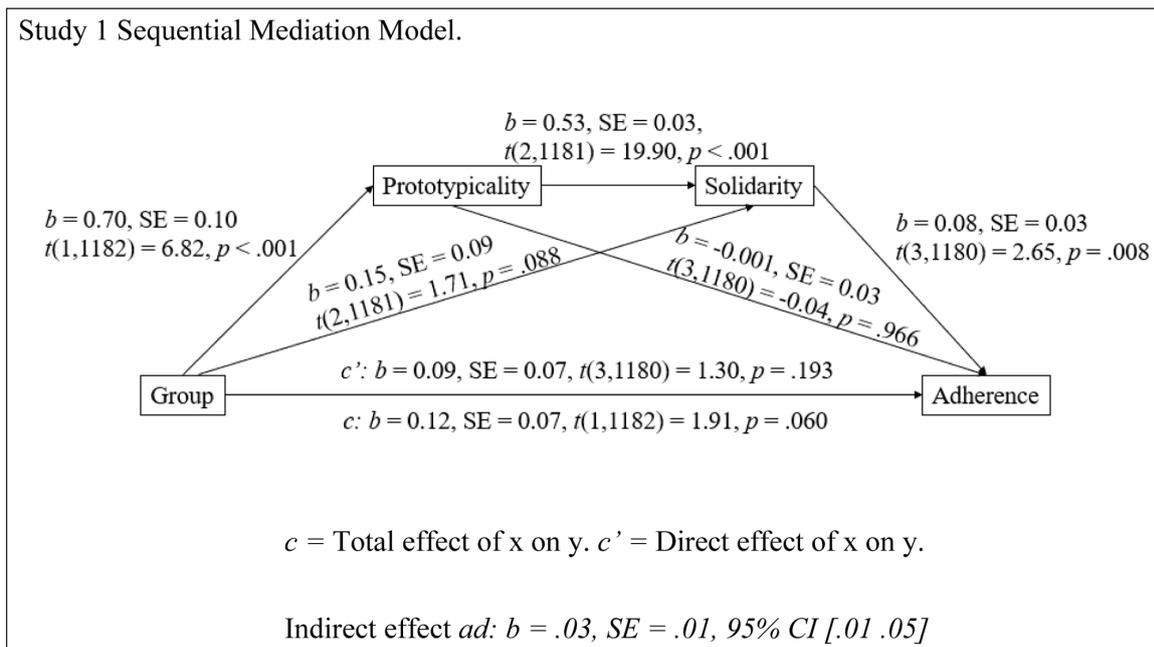


Figure 1: Sequential mediation of the effect of majority/minority group status on adherence to COVID-19 health advice mediated via prototypicality and national solidarity.

on prototypicality was statistically significant. Majority group members perceived themselves to be more prototypical of the Irish nation than minority group members. The effect of prototypicality on national solidarity, while controlling for majority/minority group status, was also statistically significant, indicating that perceiving oneself as a more prototypical member of the Irish nation goes along with stronger solidarity with the Irish national community. Finally, the effect of national solidarity on adherence to COVID-19 health advice, while controlling for prototypicality and majority/minority group status, was also statistically significant, indicating that stronger national solidarity was associated with greater adherence to the health advice. The total effect of majority/minority on adherence was not significant nor was the direct effect (see **Figure 1**). Neither the effect of majority/minority group status on national solidarity was significant, nor the effect of prototypicality on adherence, while controlling for status.

Since the present mediation results are based on cross-sectional data that prevent any conclusion about the order of the variables, we also tested a model of alternative explanations with both mediators in the reversed order (i.e., majority/minority group status, solidarity, prototypicality, and adherence). This model did not yield a statistically significant indirect effect: $b = 0.001$, $SE = 0.01$, 95% CI [-0.02, 0.02].

In summary, while there was no direct effect of majority/minority status on adherence, the hypothesised indirect effect of majority/minority membership of the national community on adherence to COVID-19 health advice was observed. These initial results suggest greater adherence to COVID-19 health advice is shown when group members perceive themselves to be prototypical of the national community, and thereby show greater solidarity with the national community. However, minority group members were underrepresented in the present sample. Therefore, we aimed to replicate these findings with a sample with a substantial representation of minority group members.

Study 2

Context

On the 18th of May, 2020, Phase 1 of the Government of Ireland Roadmap for Reopening Society and Business commenced and lasted until the 8th of June, 2020. The easing of COVID-19 restrictions allowed people to meet outdoors with up to four people while keeping at least 2 metres apart. People were still required to stay within 5 kilometres of their household and the advice continued to emphasise the importance of staying in one's physical household as much as possible. Outdoor workers could return to work and outdoor shops could reopen during this phase, on the condition that social distancing measures could be implemented. Non-contact sporting activities in groups of no more than four people within 5 kilometres of people's households were also possible. Phase 2 of the roadmap started on the 8th of June, 2020 and lasted until the 29th of June. During this phase, people were advised to stay local (i.e. travel within one's

own county, or up to 20 kilometres from one's home if crossing country boundaries). Six people from different households could meet both indoors and outdoors while adhering to social distancing guidelines. All retail shops could reopen if social distancing measures were implemented. All other businesses were encouraged to continue working from home. The wearing of face coverings on public transport was recommended during this phase.

Methods

Participants

We recruited people residing in the Republic of Ireland ($n = 537$) via Prolific, an online crowdsourcing platform, from the 5th to the 24th of June, 2020. Additionally, we used a snowballing technique inviting minority members of the national group resident in Ireland to participate in, and share, the survey from the 16th to the 28th June, 2020 in order to increase the proportion of participants with minority group status ($n = 93$). This yielded a total sample of 630 participants ($M_{age} = 32.79$, $SD = 11.44$, range 18–72 years); 357 women, 264 men, six participants identified as non-binary after excluding people who completed the survey that were not resident in Ireland. As in Study 1, we only analysed data of those participants who had completed all the measures in full. Participants who completed the survey via Prolific received 25 cents for participating (average completion time three minutes). Majority/minority group status was assessed as in Study 1. Sampling resulted in 417 majority group members, and 213 minority group members.

Based on the sample size, an alpha value of 0.05, and 80% power, sensitivity analysis using G*Power (Faul et al., 2007) indicated sensitivity to detect small effects ($f = 0.099$).

Materials and Procedure

The survey only included the variables of interest along with demographic items. We assessed majority/minority group status, prototypicality ($\alpha = 0.90$), and national solidarity ($\alpha = 0.92$) as in Study 1. In Study 2, we adjusted the adherence to COVID-19 health advice scale to represent contemporary regulations, as detailed by the Government of Ireland Roadmap for Reopening Society and Business, and updated items when regulations changed during data collection. One item from Study 1 ('I have avoided personal contact with people outside my household') was not included because this was no longer a recommended public health action. The final scale included eight items that were averaged ($\alpha = 0.77$, exact wording of all items can be found in the supplemental material).

Results and Discussion

Approach to Analysis

Table 2 displays means, standard deviations, and bivariate correlations. As in Study 1, we tested whether majority/minority group status predicted adherence to COVID-19 health advice via prototypicality and national solidarity, using 10,000 bias-corrected bootstrap samples to estimate an indirect effect.

Indirect Effect of Majority/Minority Group Status on Adherence to COVID-19 Health Advice

The predicted indirect effect of majority/minority group status on adherence via prototypicality and national solidarity replicated, with a small but significant effect, $b = 0.04, SE = 0.02, 95\% CI [0.01, 0.08]$. The combination of these variables accounted for 10% of the variance in adherence to COVID-19 health advice, $R^2 = 0.10, F(3, 626) = 18.75, p < 0.001$. The effect of majority/minority group status on prototypicality was statistically significant, indicating that majority group members perceived themselves to be more prototypical of the Irish nation than minority group members. The effect of prototypicality on national solidarity, while controlling for majority/minority group status, was also statistically significant, indicating that perceiving oneself as a more prototypical member of the Irish nation goes along with more national solidarity. Finally, the effect of national solidarity on adherence to COVID-19 health advice, while controlling for prototypicality and majority/minority group status, was also statistically significant, indicating that higher national solidarity is associated with higher adherence. Unlike Study 1, we found a significant total effect, $b = -0.21, SE = 0.09,$

$t(1,628) = -2.36, p = 0.019$, indicating that minority group members adhered more to the restrictions than majority group members. Neither the effect of majority/minority group status on national solidarity was significant, nor the effect of prototypicality on adherence while controlling for group status. The direct effect of majority/minority group status on adherence was significant (see **Figure 2**).

As in Study 1, we tested a model of alternative explanations with the order of both mediators reversed (i.e., majority/minority group status, solidarity, prototypicality, and adherence). The respective indirect effect was again not significant: $b = 0.001, SE = 0.003, 95\% CI [-0.01, 0.01]$.

In sum, the observed results support our hypothesis that the relationship between majority/minority status group and adherence to COVID-19 health advice is partially explained by national group prototypicality and national solidarity. Results of Study 2 additionally show that minority group members adhere more to COVID-19 health advice than majority group members. These findings were not expected and warrant further investigation.

A major limitation of Studies 1 and 2 is their reliance on cross sectional data. Furthermore, we have not yet tested whether an appeal to adhere to restrictions in fact matters

Table 2: Means, standard deviations and correlations for all Study 2 variables.

	Maj	Min	M (SD)	1	2	3	4
Group status	-	-	0.66 (0.47)	-	0.10*	<.001	-0.09*
Prototypicality	4.87	4.58	4.77 (1.34)		-	0.56**	0.14**
National solidarity	5.40	5.40	5.39 (1.32)			-	0.30**
Adherence	5.54	5.75	5.57 (1.09)				-

Notes. Group status refers to Majority and Minority and does not necessarily imply any hierarchical relationship between the groups. Maj = Majority, Min = Minority. * $p < 0.05$, ** $p < 0.01$.

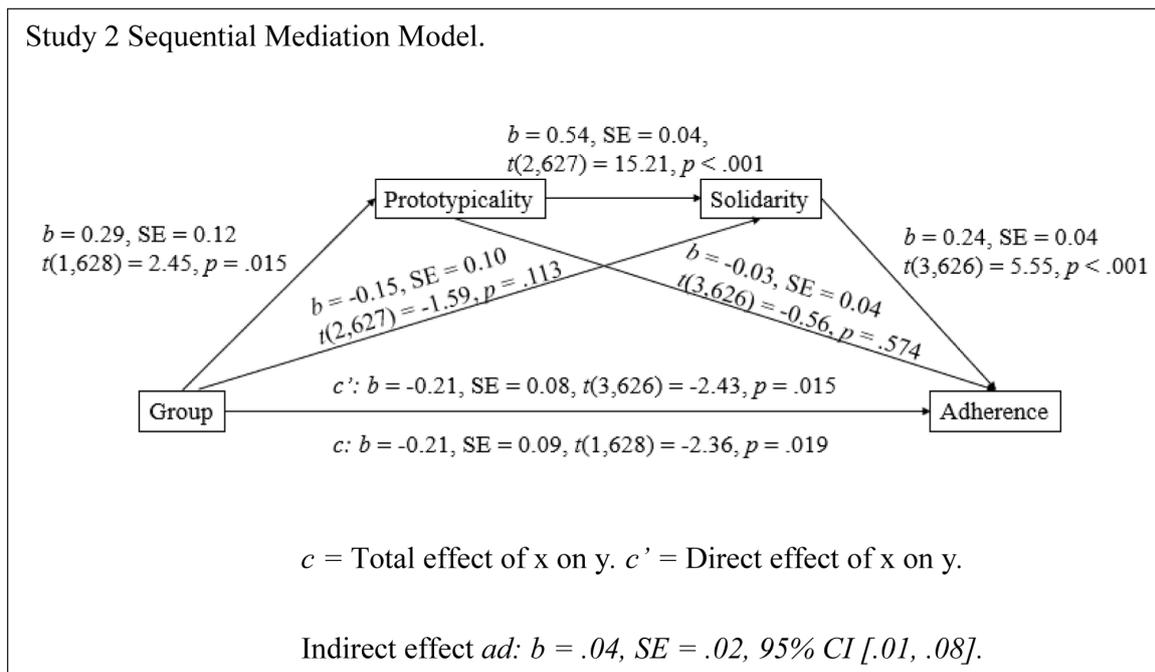


Figure 2: Sequential mediation of the effect of majority/minority group status on adherence to COVID-19 health advice mediated via prototypicality and national solidarity.

for adherence of majority and minority status groups. Testing a mediational model with cross-sectional survey data is problematic and, even though we examined alternative models and paths associated with our variables, the problem of causality remains and so an experimental design should be preferred. For these reasons, we used an experimental design in Study 3 to test the hypothesis that the call for inclusive national solidarity in response to COVID-19 increases adherence more strongly than in an exclusive solidarity control condition (see pre-registration of hypothesis: https://osf.io/ynhkhz/?view_only=80e819c7c97f401e8416bcfc050e2eb9).

Study 3

Context

On the 23rd of December, 2020, Ireland entered its worst wave of the pandemic to date with the highest number of infections registered so far. As the number of cases in Ireland rose, Ireland reimposed its highest level of lockdown nationally in early January. Schools were closed, visits to other households banned, and all non-essential retail, bars, and restaurants were closed. Non-essential travel outside of a 5 kilometres limit of one's home was not permitted. People were allowed to meet up with one other person outdoors for the purposes of exercise during this time, which lasted for 12 weeks. During this time, students and particularly those living in university housing became the focus of mainstream media attention. Adherence became a particular issue at the University of Limerick because of student parties and associated publicity (Burns 2021). This occurred in tandem with Limerick often reporting the highest incidence of daily new cases of SARS-COV-2 nationally. As a consequence, the senior university management took the unusual step of patrolling with the Gardai (Irish police service) in nightly patrols to encourage students to stay at home and to prevent mixing (Cleary 2020). University management also issued an appeal directly to students which we used as the basis for our experimental manipulation.

Methods

Participants

We recruited 689 university students to take part in an online experiment, hosted by Qualtrics ($M_{age} = 24.88$, $SD = 8.79$, range 18–61 years); 402 women, 277 men, six nonbinary people, and five participants who opted not to disclose their gender. The survey link was emailed to all students at the University of Limerick on the 26th of April, 2021. The survey was closed on the 29th of April, 2021 as the pre-registered target number of participants was surpassed. Although 922 students showed interest in the present study (i.e. started the online experiment), only participants who fully completed the measures for the present research question were included in the analyses ($n = 689$). Participants were excluded from the analysis if they failed the concentration check.

Design

The present study employed a 2×2 between-subjects design. The first between-subjects factor was appeal to adhere to restrictions operating at two levels: (i) inclusive

solidarity appeal and (ii) exclusive solidarity appeal. The second between-subjects factor was majority/minority status group. As such, the study tested the effect of an appeal to adhere to restrictions on adherence in majority ($n = 532$) and minority students ($n = 153$). The appeal to adhere to restrictions manipulation was embedded in an online survey which used a simple randomized method to assign participants alternately to either the inclusive solidarity appeal ($n = 343$) or exclusive solidarity appeal ($n = 346$) condition. The dependent variable was adherence intentions in response to WHO and Government public health advice to reduce the spread of COVID-19. Given the expected relationship of adherence with participants material circumstances (see Introduction), we controlled for demographic variables that can reflect these differences in participants; subjective socioeconomic status (SES), age, and gender to assess whether the hypothesised effect of majority/minority status group \times inclusive solidarity appeal vs exclusive solidarity appeal holds true independent of material circumstances. Since the inclusion of these covariates was not pre-registered, we also report results excluding these covariates in the supplemental materials.

Power analysis was conducted using G*Power (Faul et al., 2007). Based on our previous studies we expected a small effect size of $f = 0.025$. With a power of 0.80 and a standard 0.05 alpha error probability, G*Power indicated a minimum sample of 398 students was needed to detect a small effect with t -tests. In the analyses reported below we use ANOVA which is statistically equivalent for two-groups. Additionally, G*Power indicated a minimum sample of 158 students to detect small effects with a 2×2 ANCOVA.

Measures

COVID-19 adherence intentions

Health behaviours to prevent the spread of the virus were assessed with eight items adapted from Study 1 and Study 2 (Brug et al. 2004; Cheng & Ng 2006). A ten-item health behaviours scale was pre-registered, however two of these items (avoid public places and avoid house parties) were dropped due to concerns expressed that the survey circulated by university staff to its students could be misconstrued as support for these activities. Three further items were excluded subject to reliability analysis: handwashing, covering mouth and nose when coughing and sneezing, and mask wearing) increased the reliability of this measure ($\alpha = 0.83$). The mean score on these three items were so high that it suggested that responses were affected by social desirability. Effects were also evident with these items included in the scale. We report on the more reliable five item COVID-19 adherence measure.

However, participants were instructed that the questions were to be answered in relation to the actions *they intend to take* in the future. Higher scores indicated greater intent to engage with the adherence behaviours.

Majority/Minority group membership

All participants were asked to indicate if they identified as Irish and also whether they were member of a minority group.⁴ Participants who identified as non-Irish or

identified as a minority group member were designated as minority group members. Those who indicated they were Irish and not minority group members were designated as majority group members.

As in Study 1 and Study 2, we also assessed national solidarity ($\alpha = 0.87$) and national group prototypicality ($\alpha = 0.89$) using the same measures.

Manipulation and Procedure

Again, the study was approved by the University of Limerick Research Ethics Committee. Participants were asked to complete an online survey which randomly assigned participants to watch either of two videos (manipulation) embedded in the survey and to respond to the measures.

The video clips were used to manipulate the call to solidarity in response to COVID-19 in two conditions (inclusive solidarity appeal and exclusive solidarity appeal). In both videos the same white, Irish, female University of Limerick student, named Aoife, introduced herself and spoke to University of Limerick students about their role in containing the spread of the virus by adhering to the COVID-19 health advice. In the inclusive solidarity appeal condition, Aoife used inclusive 'us and we' language and talked about 'us all being in this together', while the backdrop was a picture of a diverse national community. In the exclusive solidarity appeal condition, Aoife used 'you' and 'your role' language and the backdrop was three Irish white male health officials and politicians at their podiums giving a COVID-19 briefing. After participants watched the assigned video, they were asked to report their intentions to adhere to COVID-19 health advice, followed by three concentration check items ('On a previous page you watched a short video clip. What was this clip about?'), the national solidarity and prototypicality measure. Finally, demographic questions were asked including gender, age, and SES.

Analytical Strategy

First, a series of one-way analyses of variance (ANOVA) determined if (i) the video manipulation influenced national solidarity and (ii) if minority group members reported lower prototypicality. Second, a 2×2 ANCOVA was conducted to examine if appeal to adhere to restrictions condition (inclusive solidarity appeal vs. exclusive solidarity appeal) and group status (majority vs. minority group) significantly predicted adherence intentions, when controlling for age, gender, and SES.

Results

Manipulation Check

A one-way ANOVA was conducted to determine whether our video manipulation influenced perceptions of national solidarity. There was a tendency that individuals in the inclusive solidarity appeal condition reported greater solidarity ($M = 4.41$, $SD = 1.49$) compared to those in the exclusive solidarity appeal condition ($M = 4.19$, $SD = 1.52$), $F(1, 687) = 3.45$, $p(\text{one-tailed}) = 0.032$, $\eta^2_p = 0.01$. A second one-way ANOVA showed that majority group members reported significantly greater prototypicality ($M = 4.82$,

$SD = 1.20$) than minority group members ($M = 4.10$, $SD = 1.48$), $F(1, 685) = 38.67$, $p < 0.001$, $\eta^2_p = 0.05$.

Impact of Solidarity Appeal Condition and Group Status on COVID-19 Adherence Intentions

An ANCOVA was conducted to examine the influence of group status (majority vs. minority) and appeal to adhere to restrictions condition (inclusive solidarity appeal vs. exclusive solidarity appeal) on reported adherence intentions to COVID-19 restrictions. Gender, age, and SES were entered as covariates. There was a significant majority/minority group status \times appeal to adhere to restrictions condition interaction on reported adherence intentions, whilst controlling for gender, age, and SES, $F(1, 652) = 4.20$, $p = 0.041$, $\eta^2_p = 0.006$. **Figure 3** demonstrates that minority groups reported greater adherence intentions in response to the inclusive solidarity appeal as compared to the exclusive solidarity appeal condition ($M = 4.70$, $SD = 1.29$ vs. $M = 4.01$, $SD = 1.00$, respectively). On the other hand, majority group members reported similar adherence intentions across the solidarity appeal conditions ($M = 4.37$, $SD = 1.36$ vs. $M = 4.36$, $SD = 1.45$, respectively). Furthermore, there was a main effect of appeal to adhere to restrictions condition on intended adherence, $F(1, 652) = 5.27$, $p = 0.022$, $\eta^2_p = 0.008$, individuals in the inclusive solidarity appeal condition reported greater intentions to adhere than those in the exclusive solidarity appeal condition ($M = 4.45$, $SD = 1.35$ vs. $M = 4.30$, $SD = 1.36$), though this effect is best understood with reference to the interaction effect above.

General Discussion

The present findings indicate that national solidarity is an important predictor of adherence to COVID-19 related public health advice. Across two cross-sectional studies we demonstrated that national solidarity and national prototypicality are mechanisms that help explain majority and minority members' adherence to the national restrictions to combat COVID-19. Extending on this, we experimentally manipulated an appeal to adhere to restrictions and demonstrated that an inclusive solidarity appeal compared to an exclusive solidarity appeal, was associated with greater intentions to adhere to restrictions during a strict lockdown, particularly for minority students. This offers preliminary causal evidence for some of the observed relationships in Study 1 and Study 2. Notably, the present results do not indicate that minority group members adhere less to the national health advice than majority group members. Rather, our results demonstrate that perceived prototypicality and national solidarity are important intervening variables in the link between national group's status and adherence.

The observed results are consistent with Postmes and colleagues' (2013) suggestion that perceiving oneself as a typical group member (i.e. prototypicality) may be a precursor for investment related aspects of ingroup identification such as solidarity with the ingroup. Crucially, the present research highlights the relevance of national solidarity for majority and minority members' adherence to the national restrictions to combat COVID-19. These

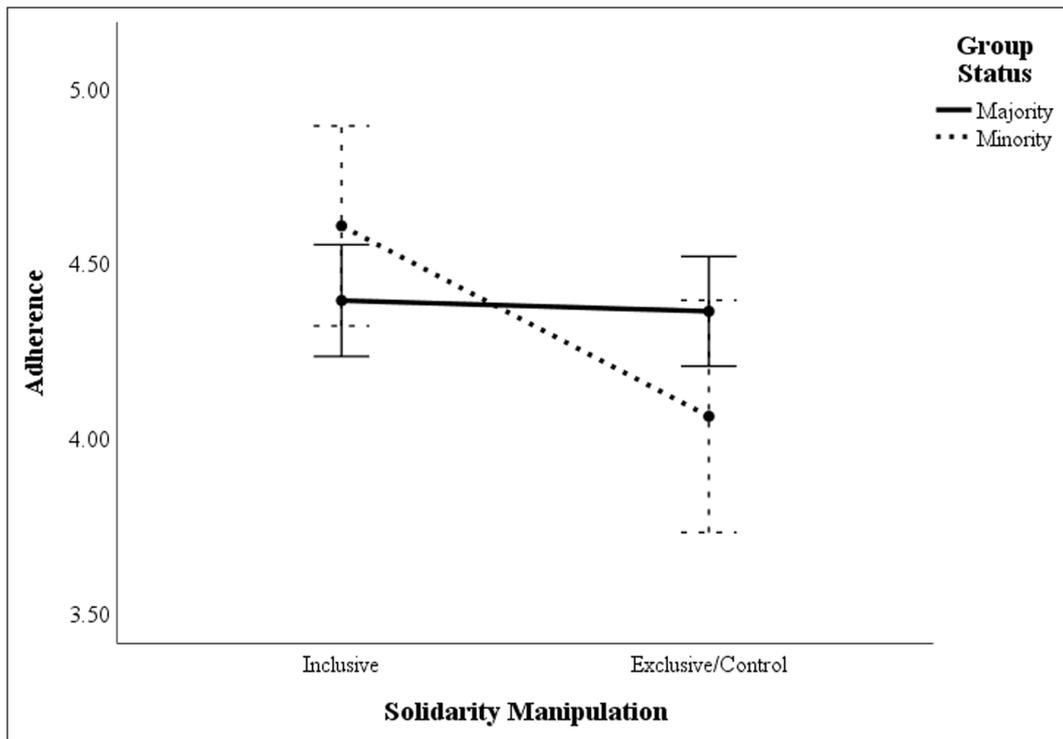


Figure 3: Minority group members in the inclusive solidarity messaging group reported greater adherence to COVID-19 guidelines compared to those who heard the exclusive message.

findings make an important contribution to our understanding of calls to national solidarity in response to the COVID-19 pandemic (Holmes et al., 2020). The study shows that, as expected, national solidarity is associated with the public's adherence to health advice (Haslam et al., 2018; Reicher & Haslam 2010). However, prototypicality is also important because national solidarity is associated with the extent to which people see themselves as representative members of the national community (Study 1 and Study 2). As such, the association between group membership, national prototypicality and national solidarity, are social identification processes that help to explain interindividual differences in reported adherence behaviours.

Nations have been central to building solidarity across the diversity of citizens (Schnapper 2002), and a sense of national community is a positive way to unite people (O'Donnell et al., 2016). Social psychological theory suggests that understandings of national communities are banal and taken-for-granted in the public imagination and are commonly understood as homogenous, being built on implicit assumptions about stereotypical national characteristics (Billig 1995). Calls to solidarity that include *all* constituent members in the nation, as well as calls that speak to the many hues of national group members, are likely to be particularly effective in promoting adherence because of expansion in the definition of the national community. Our experimental study (Study 3) speaks to this suggestion, showing that an inclusive compared to an exclusive solidarity appeal which explicitly primed an expanded, diverse definition of the national community, had a greater impact on minority group members' reported solidarity and intentions to adhere to public health advice

than it had on majority group members'. Contrary to predictions, the solidarity appeal did not impact majority participants' reported adherence intentions.

Currently, behaviours such as physical distancing, hand-hygiene, and self-isolation are some of the only measures we have to combat this unprecedented global health crisis while waiting for the vaccine rollout. The WHO has increasingly highlighted that public health messages are often framed to invoke a sense of solidarity with the national community; this is despite the global nature of the pandemic. The threat associated with the pandemic has also given rise to divided responses, notably linked to strong socio-political identities (Gollwitzer 2020). Given the propensity for the threat of the pandemic to play into national protectionism (Maher et al 2020), appeals to national solidarity need to be cautiously employed. Ireland's success in this regard can be seen to build on already high levels of social cohesion (Dragolov et al., 2016). In more divided societies, those building solidarity through national frames of reference are likely to have to tread more cautiously.

There are many factors that may affect both majority and minority group members' adherence behaviour. Some of these factors may lead majority members to show more adherence than minority members (for example, when majority members are working in occupations where working from home is possible). Other factors may work in an opposite way, leading minority members to show more adherence than majority ones (for example, when minority members work in the health sector where hygiene is of even more relevance). Another explanation may be that minority group members are more sensitive to relational cues, such as those embedded within inclusive solidarity

messaging, than majority members. In this individualised world, an independent self-construal is presumed to be the automatic response for everybody, however, this is not necessarily the case for minority group members who are more likely to behave and act in terms of interdependence with others (Kraus et al., 2012; Stephens et al., 2012). Irrespective of the complex direct relationship between group status and adherence behaviour, the present data demonstrate that identification processes are central to majority and minority members' engagement and adherence to national public health advice.

In Study 1, in line with our initial hypotheses, less prototypical minority group members reported lower levels of national solidarity than majority group members. However, in this study, majority group members were overrepresented, which may have reduced the reliability of the results. Therefore, to counter this overrepresentation of majority group members, Study 2 included targeted sampling of minority status group members to ensure adequate representation of the minority group. Again, an indirect link was found between majority/minority group status, national prototypicality, national solidarity, and adherence to health advice. These studies support the assertion that majority/minority group membership is linked to engagement with public health advice in a complex and nuanced way.

Taken together, these studies demonstrate a process that connects adherence to public health advice through solidarity to subgroup membership. Using different proportions of minority and majority group members, and with different situational and boundary conditions in terms of phases of living with COVID-19, we found converging evidence that majority and minority group membership is linked to engagement with public health advice via interindividual differences in perceived prototypicality for the national ingroup and solidarity with that group. In Study 3, an inclusive solidarity appeal and an expanded diverse definition of the national community increased minority group members' adherence compared to an exclusive solidarity appeal. Majority group members' adherence on the other hand was not affected by how the appeal was framed. This has implications for how public health officials communicate health advice and highlights the importance of calls for solidarity being inclusive of all members of society. However, from Study 1 and Study 2 alone we could not infer public health messaging was influencing solidarity. Study 3 addresses this limitation and provides preliminary evidence that an inclusive appeal for solidarity, where we are indeed all (including less prototypical members) in it together, has the potential to affect future adherence behaviours (or at the very least adherence intentions), particularly among those in minority groups.

Notably, the main effect of the manipulation in Study 3 is quite small, and it needs to be interpreted with the interaction in mind. Instead of affecting both minority and majority members, results indicate that the appeal to adhere to restrictions manipulation only affected minority members' adherence. Therefore, solidarity appeals

need to be inclusive to increase minority group members' adherence. If the solidarity appeal is framed as exclusive, it does not appear to have the desired effects on minority members adherence, but it rather decreases adherence intentions compared to an inclusive solidarity appeal.

The generalisability of our findings is also linked to the national jurisdiction of Ireland. As such, we caution researchers to apply our findings with sensitivity to the specific features of national identity in countries where they may be applied. That said, specific cases can inform, and have informed, wider efforts to combat COVID-19. Further studies could address this limitation by exploring the indirect links between majority and minority group membership and adherence to public health advice in other countries. Though the current findings are mostly in line with the predicted directionality guided by our theoretical rationale and previous empirical evidence, further studies incorporating longitudinal designs are recommended to support causality. Nevertheless, the nature of the effects demonstrated are mainly consistent with our proposed theoretical framework (Hayes 2013). As a result, while acknowledging this limitation, we believe that the present research provides valuable insights into social identification processes connected to adherence to health advice during the COVID-19 pandemic.

The studies reported here demonstrate that solidarity and national prototypicality are important factors in pandemic mitigation measures. In particular, they influence differences in adherence to national health advice aimed at slowing spread of a virus. Majority/minority group membership was linked to adherence via national prototypicality and national solidarity. Furthermore, the present data provides preliminary evidence that an inclusive solidarity appeal increases minority group members' adherence intentions compared to an exclusive solidarity appeal, while leaving majority group members' adherence unaffected. Indeed, if we are all to act together to fight a virus, we need to reference the diversity of the nation to build diverse national definitions and collective solidarity among majority and minority members alike. Banal representations of the nation can communicate that some members may represent the national prototype more so than other members (Joyce et al., 2013). This may highlight existing divisions that already serve to make minorities vulnerable and in so doing make less prototypical members of the national group even more vulnerable during a global health crisis (Atchinson et al. 2020; Chung et al. 2020). These results have important practical implications as present COVID-19 public health responses pivot to persuading people to use the newly available vaccines.

Appendix Study 3 Supplemental Material

In line with the pre-registered analysis to test hypothesis 1, an independent-samples t-test was conducted to compare the adherence intention scores of those participants exposed to the inclusive/solidarity message with those exposed to the exclusive/control message. There was a statistically significant difference in scores for those in the

inclusive/solidarity condition ($M = 4.45$, $SD = 1.35$) and those in the exclusive/control condition ($M = 4.28$, $SD = 1.39$), $t(687) = 1.65$, $p = .045$ (one-tailed).

In line with the pre-registered analysis to test hypothesis 2, a 2×2 ANOVA was conducted to explore the impact of the messaging (inclusive/solidarity vs exclusive/control) on the adherence intentions of status groups (majority vs minority). The interaction effect between condition and status group was significant $F(3, 681) = 6.92$, $p = .01$. Whereas, Majority group members adherence intentions in response to the inclusive/solidarity message ($M = 4.39$, $SD = 1.36$) did not substantially differ in response to the exclusive/control message ($M = 4.36$, $SD = 1.46$), Minority group members reported higher adherence intentions in the inclusive/solidarity condition ($M = 4.67$, $SD = 1.31$) compared to the exclusive/control message ($M = 3.98$, $SD = 1.04$).

The main effect for condition was also significant $F(3, 681) = 8.02$, $p = .005$. The main effect for status group however was not significant $F(3, 681) = 0.15$, $p = .69$.

Data Accessibility Statement

All materials, data and supplementary materials are available on the Open Science Framework (see https://osf.io/y64gs/?view_only=1778d8bde8614aca818f90e1c60891b6).

Notes

- Exploratory factor analysis revealed three underlying factors: avoidance of public places, physical distancing, and hygiene. The 'wearing a face mask' item did not load on any of these subcomponents.
- Government health advice changed during the second wave of the restrictions, requiring people to stay within 5 km of home, rather than within 2 km as advised during wave 1. The analyses reported includes items relating to staying within 2 km, but effects hold in both studies when this item is present and when it is removed.
- Including the 'wearing a face mask' item in the adherence scale showed the same results for the sequential mediation.
- Our pre-registration outlines self-identified minority group and self-identified national group membership as two variables. However, many of our respondents were represented in both groups and so assumption of independence of the two groups was violated. For this reason, they were merged for ANCOVA.

Ethics and Consent

All procedures performed in studies involving human participants were approved by institutional research ethics committee and conducted in accordance with the Code of Professional Ethics of the Psychological Society of Ireland, and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study. All authors consented to the submission of this manuscript.

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Competing Interests

The authors have no competing interests to declare.

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