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**Lalot, F., & Abrams, D. (2023). A Stranger or a Friend? Closer Descriptive Norms Drive Compliance with COVID-19 Social Distancing Measures. *Zeitschrift für Psychologie, 231*(2).**

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# A Stranger or a Friend? Closer Descriptive Norms Drive Compliance with COVID-19 Social Distancing Measures

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## Conflict of Interest

The authors have no competing interests to declare.

## Open Data

Open Data: The information needed to reproduce all of the reported results is available at https://osf.io/z29sa/

Open Materials: The information needed to reproduce all of the reported methodology is available at https://osf.io/z29sa/

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## Abstract

A growing volume of work suggests a positive impact of descriptive norms on health-protective behaviour in the COVID-19 pandemic. However, past work has often been correlational and has rarely compared the effect of different group norms. In the present paper, we present the results of a longitudinal study ($N$=1051) that addresses these gaps by testing the cross-sectional and cross-lagged effects of norms, and directly compared three different norms (close circle, neighbourhood, and country) on compliance with COVID-19 regulations. Results revealed a positive effect of the close circle norm (associated with more compliant behaviour both cross-sectionally and longitudinally), no effect of the neighbourhood norm, and a negative effect of the national norm (associated with less compliant behaviour). Compliant behaviour also led to a greater close circle norm longitudinally, suggesting that both feed into each other. We discuss the challenges but also the chances this research highlights for norm-based interventions.


*Keywords*: compliance; COVID-19; descriptive norms; social influence; social norms

# A stranger or a friend? Close-circle descriptive norms drive compliance with social distancing measures during the COVID-19 pandemic

## Introduction

The potential for norms to influence individuals' behaviour has long been recognised in psychology research. People are more likely to adopt a behaviour if they perceive it as socially valorised by a relevant group (i.e., injunctive norm) and already adopted by others (i.e., descriptive norm, Cialdini, 2012; Cialdini et al., 1990). Unsurprisingly, during the COVID-19 pandemic evidence confirms that individuals have been more likely to adopt health protective behaviour and respect social distancing regulations if they perceived other people as doing the same (e.g., Peterson et al., 2021; Rudert & Janke, 2021; Tunçgenç et al., 2021).

However, COVID-19 research has not consistently determined the *level* at which descriptive norms are operationalised, sometimes focusing on close others (family, friends) and sometimes on the social group at large ("others"). Moreover, the impact of norms at these different levels is rarely compared. In addition, studies measuring COVID-19 norm perceptions generally employed cross-sectional designs, making it difficult to infer causality. In the present paper, we address these gaps with evidence from a longitudinal study that enables us to (a) test both the cross-sectional and cross-lagged effects of norms, and (b) directly compare the effect of three different levels of descriptive norm (i.e., family and friends, one's neighbourhood, and people in the country) on compliance with COVID-19 regulations.

### The Impact of Social Norms on Behaviour

Social norms represent the observation of and expectations about the opinions and actions of those around us; they are often associated with specific social groups (national

group, organisation, team, etc., Smith, 2020). Social influence research proposes that people turn to social norms to fulfil two different needs: on the one hand, a need for affiliation and social approbation (i.e., normative social influence), and on the other hand a need to reduce uncertainty (i.e., informational social influence, Deutsch & Gerard, 1955). In other words, people might adopt others' behaviours and opinions either because they want to be accepted in the group and/or because they use them as cues to the 'correct' demeanour.

Cialdini's influential focus theory of normative conduct (Cialdini, 2012; Cialdini et al., 1990) distinguishes between two types of norms. Descriptive norms "refer to what is commonly done in a given situation, and they motivate human action by informing individuals of what is likely to be effective or adaptive behaviour in that situation" (Goldstein & Cialdini, 2009, p. 275), whilst injunctive norms "refer to what is commonly approved or disapproved within the culture, and they motivate behaviour through informal social sanctions" (ibid.). The positive influence of social (injunctive and descriptive) norms on individuals' behaviour is widely acknowledged: norms feature predominantly in many models of human behaviour such as the theory of planned behaviour (Ajzen, 1991) or the prototype willingness model (Gerrard et al., 2008) and have informed many behaviour change interventions (for a discussion of norm-based interventions, see e.g., Miller & Prentice, 2016; Reynolds et al., 2015).

An important aspect of normative influence is to consider the specific group whose norm people might follow. According to a social identity approach (Hogg & Abrams, 1988; Turner et al., 1987), people are not motivated to respect the norms of just any group but specifically that of their ingroup, or reference group (Goldstein & Cialdini, 2009; Hogg, 2003). Willingness to follow the group norms also increases with the salience of group identity and the importance of group membership for one's self-definition (Abrams & Hogg, 1990; Abrams et al., 1990; Christensen et al., 2004; Hogg, 2003). Crucially, individuals are

members of many different groups ranging from smaller and concrete entities (e.g., one's family, close group of friends) to broader and more abstract ones (e.g., a national or ideological group, Turner, 1991). One's behaviour at a given time and in a given context might therefore depend on the group membership that is contextually most salient and more important. This in turn will determine which group's norms will be most influential (Neville et al., 2021; Reynolds et al., 2015).

**The Impact of Norms in the COVID-19 Pandemic**

Norms might be expected to be particularly influential during a period of crisis marked by high levels of uncertainty. Indeed, groups facing greater societal threats implement stronger norms and expect greater compliance and coordination from their members (Roos et al., 2015). Consistent with the uncertainty-reduction function of informational influence, people also rely on norms to a greater extent during uncertain times to determine how to best behave in the situation (Cialdini & Goldstein, 2004; Gelfand & Harrington, 2015). Both the salience and the uncertainty arguments suggest that norms might be especially potent during the COVID-19 pandemic (Kruglanski et al., 2021), because of the the continual emergence of new behaviours that quickly became normative (mask-wearing, social distancing and so on) and the multiple sources of uncertainty (about where the virus was coming from, how dangerous it really is, how it transmits, how to best limit the spread, etc.), respectively.

An emerging body of findings on COVID-19 compliance suggests this was indeed the case (see Table 1 for an overview). Specifically, a number of papers have looked at the relationship between people's perception of descriptive norms (i.e., belief about how much others adopt health protective behaviours and respect governmental regulations) and their own behaviour or intentions. Consistent with expectations, researchers have found positive relationships between norms and behaviour (Andarge et al., 2020; Chambon et al., 2022;

Farias & Pilati, 2022; Lin et al., 2020; Nakayachi et al., 2020; Norman et al., 2020; Peterson et al., 2021; Prasetyo et al., 2020; Reinders Folmer et al., 2021; Rudert & Janke, 2021; Tunçgenç et al., 2021). A positive descriptive norm was also associated with lower scepticism (i.e., denial of the seriousness of the virus, Latkin et al., 2021). In an experiment manipulating normative information, Sinclair and Agerström (2021) consistently found a significant – although small – effect of the strong descriptive norm on adolescents' intentions to take the COVID-19 vaccine. Finally, it is worth noting that, prior to this pandemic, researchers had identified a positive effect of descriptive norms on the adoption of similar health protective behaviour against the flu (e.g., Miller et al., 2012; Yardley et al., 2010).

Although these findings are mostly consistent, the extant research suffers from two main limitations. First, most of the work cited above relied on cross-sectional design, which limits a causal interpretation of the findings (as exceptions, Lin et al., 2020; Norman et al., 2020; and Peterson et al., 2021, utilised longitudinal designs; and Rudert & Janke, 2021, used a cross-lagged panel model). Longitudinal designs are desirable if one hopes to infer causal links and justify the development of norm-based interventions to promote health protective behaviour. Indeed, although theoretically one would expect norms to precede behaviour (Ajzen, 1991), an alternative motivational explanation is also possible: people might distort their perception of others' behaviour so as to validate their own beliefs and justify their own behaviour (see e.g., the false consensus effect, Mullen et al., 1985). In the one test (that we are aware of) of the cross-lagged relationships between norms and COVID-19 protective behaviours, Rudert and Janke (2021) indeed found both relationships to hold: perceived descriptive norms amongst family and friends at time 1 predicted behaviour at time 2 (two weeks later), but behaviour at time 1 also predicted norms at time 2. Therefore, we contend that the bidirectional relationships between perceived norms and behaviour need further investigation.

**Table 1**.

*Social norms during COVID-19: Research overview*

| Article | Design | Population and N | Norm | Group | Dependent measure | Findings |
|---|---|---|---|---|---|---|
| Andarge et al. (2020) | Cross-sectional | *N* = 806 adults with chronic conditions, Southern Ethiopia | Unclear | Unclear | Intentions to adopt personal preventive measures | Subjective norm positively associated with intentions |
| Chambon et al. (2022) | Cross-sectional | *N* = 1022 adults, UK and Netherlands | Descriptive | Close (family & friends) + People in general | Preventive behaviour | Strong relationship between close norm and preventive behaviour (network analysis). ***No*** direct relationship between general norm and behaviour. |
| Farias and Pilati (2021) | Cross-sectional | *N* = 2056 adults, Brazil | Descriptive and injunctive | Close (family & friends) + People in general | Intentions of noncompliance with social distancing | Only the close descriptive norm is associated with intentions (injunctive norms and general norms are ***not***) |
| Lin et al. (2020) | Longitudinal | *N* = 1569 adults, Iran | Injunctive | Close (people who are important to me) | Preventive intentions + behaviour | Subjective norm positively predicts behaviour (directly and indirectly through intentions) |
| Nakayachi et al. (2020) | Cross-sectional | *N* = 1000 adults, Japan | Injunctive | Perceived normative pressure (people in general) | Frequency of wearing masks | Subjective norm positively associated with mask wearing |
| Nivette et al. (2021) | Longitudinal | *N* = 737 young adults, Switzerland | Descriptive | People in general | Non-compliance with public health measures | Subjective norm does ***not*** predict non-compliance |
| Norman et al. (2020) | Longitudinal | *N* = 477 adults, UK | Descriptive and injunctive | People in general | Preventive behaviour | Both norms are related to behaviour (zero-order correlation), but effects disappear when other variables are included in the model |
| Peterson et al. (2021) | Longitudinal | *N* = 738 adults, USA | Descriptive | Close/intermediate (family & close friends & people in your community) | Preventive intentions + behaviour | Subjective norm positively predicts behaviour (directly and indirectly through intentions) |
| Prasetyo et al. (2020) | Cross-sectional | *N* = 649 adults, Philippines | Descriptive | Close/intermediate (most people I know) | Intentions to follow recommendations | Subjective norm positively associated with intentions |
| Reinders Folmer et al. (2021) | Cross-sectional | *N* = 2919 adults, USA | Descriptive | Close/intermediate (most people I know) | Adherence to social distancing measures | Subjective norm positively associated with adherence |
| Rudert and Janke (2021) | Longitudinal | *N* = 1907 adults, Germany | Descriptive | Close (family, friends, acquaintances) | Adherence to social distancing measures | Subjective norm positively predicts adherence, and vice-versa (cross-lagged) |
| Tunçgenç et al. (2021) | Cross-sectional | *N* = 6675 adults, UK, Turkey, and 10+ other countries | Descriptive and injunctive | Close (close circle) + national (country) + world | Adherence to social distancing measures | Close and world norms positively associated with adherence (national norm is ***not***) |

Second, most of this previous work has measured norms with respect to only one single group, differing from study to study. Some work (often building on the theory of planned behaviour) focuses on an undefined group of others close to the self (e.g., "people you know", "people who are important to you", Andarge et al., 2020; Lin et al., 2020; Miller et al., 2012; Prasetyo et al., 2020; Reinders Folmer et al., 2021; Yardley et al., 2010) while some asks about the group at large: "other people" or "people in general" (Nakayachi et al., 2020; Nivette et al., 2021; Norman et al., 2020). Others focus on a smaller and more concrete group: Rudert and Janke (2021) asked about the descriptive norm of one's "family and friends", and Peterson et al. (2021) about one's family, friends, and close community (items aggregated into a single score).

Only a few pieces of work measured and compared the norm of different ingroups. All of these, unfortunately, are cross-sectional. Specifically, Chambon et al. (2022) assessed the descriptive norm of one's family-and-friends, and of people in general; Farias and Pilati (2022) included family, peers, and people in general; and Tunçgenç et al. (2021) included family-and-friends, one's country, and the world. Crucially, these studies suggest that in the context of the COVID-19 pandemic, the descriptive norm of close others (family and friends) has a stronger impact on individual behaviour than the descriptive norm of wider and more abstract groups (people in general, country, world).

Different theoretical perspectives can account for this stronger effect of a close-circle norm. The social identity theory perspective holds that an individual will be more motivated to conform with the norms of a group that is more salient and more relevant to the self (Christensen et al., 2004; Hogg, 2003). Arguably, one's family and friends might constitute a more relevant and salient target as well as a group with whom one shares more attributes and similarities, than larger group such as the nation, or the world. The smaller size of the close-circle group might even bolster the positive impact of conformity on social identity for the

individual, as compared to a larger group (Brewer, 2003). In addition, an informational influence perspective (Deutsch & Gerard, 1955) suggests that people might believe that their close-circle group shares their own social reality more closely and therefore that their behaviour is a more relevant source of information than that of other people in different places or from a different background (Goldstein et al., 2008). People might believe that health protective behaviour is more or less relevant based on their local context, for example, local infection rates, (dis)trust in their community, or even shared medical history within the family.

Another, related, explanation lies in the idiosyncrasy of the pandemic itself: if one's close-circle group includes people more vulnerable to the virus, we can expect the group's norm to be more careful (as more vulnerable people need to protect themselves better). At the same time, one's motivation to adopt health protective behaviour would increase out of a prosocial concern for these vulnerable close others (e.g., Lalot et al., 2022) – resulting in a positive correlation between the descriptive norm and one's own behaviour. Finally, one's behaviour is more directly observable (and potentially criticisable) by close others (see Latané et al., 1979). "People in general" might not know whether a particular individual washes their hands regularly, or respects social distancing measures, but that person's close circle will. This direct accountability might make people more cautious about respecting the close circle's norm, even if only out of mere compliance and impression management concerns (Kelman, 1958; Moscovici, 1980).

## The Present Research

In summary, a growing amount of work suggests there has been a positive impact of descriptive norms on the adoption of health protection behaviour during the COVID-19 pandemic. However, past work has often relied on correlational designs, limiting the potential for causal inference. Although different studies have considered norms at different levels

(ranging from close others to the social group at large) they have rarely compared them. The present paper shares the results of a longitudinal study which addresses these two gaps by (a) testing both the cross-sectional and cross-lagged effects of norms, and (b) directly comparing the effect of three different norms (i.e., family and friends, one's neighbourhood, and people in the country) on compliance with COVID-19 regulations. Given that descriptive and injunctive norms may sometimes contradict each other, and that in this case the descriptive norm tends to prevail (Cialdini et al., 1990; Goldstein & Cialdini, 2009; Neville et al., 2021), we focus here on descriptive norms (see also Rudert & Janke, 2021).

Based on previous findings, we expect that the positive effect of norms on compliance should increase with their psychological proximity to the self. We expect norms to have an effect on individual behaviour both cross-sectionally and longitudinally. We also explore the converse positive effect of compliant behaviour on perceived norms in the cross-lagged panel model.

## Methods

### Participants and Procedure

Data were collected as part of a large-scale survey of social cohesion in the UK during COVID-19 (Abrams et al., 2021). We focus here on consecutive waves of data collection allowing for longitudinal and cross-lagged analyses: August-September 2020 (T1) and October 2020 (T2). Sample size was determined prior to data collection based on feasibility and the available funding. Respondents were recruited to complete an online survey through two complementary channels: via Qualtrics Panels, and via social media and distribution through partnering local councils and associations.[1] All respondents gave their

[1] The overall research project had a strong focus on and aimed to compare the lived experiences of people from different areas during the pandemic. Qualtrics Panels could not offer to recruit sufficient numbers of respondents from some of the small localities targeted for this project, making it necessary to reach these respondents through other means.

informed consent prior to starting the survey and were remunerated £5 for their participation. The research received approval from the School of Psychology Ethics Committee at the University of Kent.

A total of 3,372 participants completed the T1 questionnaire, of which 1,138 also completed the T2 questionnaire. We excluded 87 participants who failed two attention checks, resulting in a final longitudinal sample of $N$ = 1,051 (431 men, 609 women, 1 'other' and 10 undisclosed, $M_{age}$ = 49.95, $SD$ = 15.17). Participants completed measures of perceived descriptive norms and personal compliance with COVID-19 government instructions. Descriptive statistics and correlations between all measures are reported in Table 2. Participants also completed other measures that are beyond the scope of the present paper. All data and code for the analyses are publicly available on the OSF webpage of the project: https://osf.io/z29sa/.

**Materials**

**Perceived Descriptive Norms**. At both time points, participants were asked what proportion of people from different categories, in their opinion, was "closely respecting the government instructions about social distancing" (i.e., perceived descriptive norm; all items: 1 = Almost none of them, 5 = Nearly all of them): (1) *People in the UK* (national norm), (2) *People in your neighbourhood* (local norm), and (3) *Your family /* (4) *Your friends* (these last two items were aggregated into a single average score of close circle norm, $r_{T1}(1049) = .52$, $p < .001$, $r_{T2}(1005) = .60$, $p < .001$).

**Compliance With COVID-19 Regulations**. Participants were asked to report their personal degree of compliance with government instructions, which we measured at two levels. A first item measured their general compliance with COVID-19 regulations: "How do you think your own behaviour compares to the government guidelines?" (1 = Less careful than the guidelines, 5 = More careful than the guidelines). To consider a more specific and

concrete form of compliance, a second item assessed their likelihood of breaking the mandatory 14-day self-isolation rule after having been in contact with someone who tested positive (1 = Extremely unlikely, 7 = Extremely likely):

> *People who have been in close contact with someone who tested positive to coronavirus and whom are called by the Test & Trace (T&T) service are then supposed to stay at home (self-isolate) for 14 days. Let's imagine T&T contacts you. How likely would you be to break the self-isolation before the end of the 14-day period?*

This emphasis on mandatory self-isolation reflected the state of things in the UK during autumn 2020: In the absence of a vaccine, efforts to limit the spread the infection were focused on quarantine for people who tested positive and self-isolation for their close contacts, who were localised and contacted through the government "Test and Trace" system. However, it was evident that the government lacked the resources to enforce strict respect for the rule (e.g., calling or visiting to check on people supposed to be isolating) and relied largely on people's voluntary compliance.

**Table 2.**

*Descriptive statistics and zero-order correlations between all measures*

| | | | Pearson's correlations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *M* (*SD*) | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | *Time 1* | | | | | | | | | | |
| 1 | T1 National norm | 3.35 (0.81) | .44*** | .35*** | -.10** | -.01 | .42*** | .31*** | .24*** | -.11*** | .02 |
| 2 | T1 Local norm | 3.45 (0.95) | | .46*** | .04 | -.09** | .25*** | .47*** | .25*** | .002 | -.09** |
| 3 | T1 Close circle norm | 3.95 (0.79) | | | .19*** | -.20*** | .25*** | .30*** | .48*** | .18*** | -.20*** |
| 4 | T1 Self-reported compliance | 3.52 (1.02) | | | | -.31*** | -.06 | .02 | .21*** | .60*** | -.29*** |
| 5 | T1 Breaking self-isolation | 1.84 (1.22) | | | | | -.03 | -.10** | -.25*** | -.29*** | .44*** |
| | *Time 2* | | | | | | | | | | |
| 6 | T2 National norm | 3.45 (0.83) | | | | | | .47*** | .38*** | -.08* | .01 |
| 7 | T2 Local norm | 3.56 (0.96) | | | | | | | .46*** | .04 | -.04 |
| 8 | T2 Close circle norm | 4.09 (0.86) | | | | | | | | .20*** | -.23*** |
| 9 | T2 Self-reported compliance | 3.47 (1.03) | | | | | | | | | -.36*** |
| 10 | T2 Breaking self-isolation | 1.85 (1.24) | | | | | | | | | |

$^{*}$ $p < .05$, $^{**}$ $p < .01$, $^{***}$ $p < .001$

## Results

### Cross-Sectional Analyses

We first tested the relationships between descriptive norms and compliant behaviour in each wave with cross-sectional linear regression analyses.[2] Results are reported in Table 3. Within both waves there was a consistent *positive* effect of the close circle norm (i.e., family and friends) which was related to higher levels of self-reported compliance (T1: $\beta = .26$, $p < .001$; T2: $\beta = .27$, $p < .001$) and lower self-perceived likelihood of breaking the 14-day self-isolation period (T1: $\beta = -.22$, $p < .001$, T2: $\beta = -.28$, $p < .001$). In contrast, the perceived national norm (i.e., people in the UK) had a *negative* effect on compliance, decreasing self-reported compliance (T1: $\beta = -.19$, $p < .001$, T2: $\beta = -.18$, $p < .001$) and – although to a lesser extent – increasing likelihood of breaking self-isolation (T1: $\beta = .07$, $p = .038$, T2: $\beta = .09$, $p = .013$). In-between these two contrasting effects, the local norm (i.e., neighbourhood) had no significant effect on compliance ($\beta_s < .05$, $p_s > .22$).

**Table 3.**

*Results of the cross-sectional analyses testing the effect of the three norms on self-reported compliance and likelihood of breaking self-isolation at the two time points*

| | *b* (*SE*) | 95% CI *b* | *t*-test | *p*-value | Standardised estimate *β* |
|---|---|---|---|---|---|
| **Time 1: Compliance** | | | | | |
| Constant | 3.52 (.030) | [3.46, 3.58] | 116.13 | < .001 | |
| National norm | -0.19 (.034) | [-0.26, -0.12] | -5.49 | < .001 | -.185 |
| Local norm | -0.001 (.036) | [-0.07, 0.07] | -0.02 | .98 | -.001 |
| Close circle norm | 0.26 (.035) | [0.20, 0.33] | 7.58 | < .001 | .259 |
| *Regression*: $F(3, 1047) = 25.44$, $p < .001$, $R^2_{adj} = .07$ | | | | | |
| **Time 1: Likelihood of breaking self-isolation** | | | | | |
| Constant | 1.84 (.037) | [1.77, 1.91] | 49.80 | < .001 | |
| National norm | 0.09 (.042) | [0.01, 0.17] | 2.08 | .038 | .071 |
| Local norm | -0.02 (.044) | [-0.11, 0.06] | -0.53 | .60 | -.019 |
| Close circle norm | -0.27 (.042) | [-0.35, -0.19] | -6.38 | < .001 | -.220 |

[2] Controlling for demographics (age, gender, socioeconomic status, and political orientation) left the results virtually unchanged; we therefore do not discuss these variables further. Outputs of these additional analyses can be found in Supplementary Material ESM1.

| | | | | | |
|---|---|---|---|---|---|
| *Regression*: $F(3, 1047) = 16.69$, $p < .001$, $R^2_{adj} = .04$ | | | | | |
| **Time 2: Compliance** | | | | | |
| Constant | 3.47 (.031) | [3.41, 3.53] | 110.89 | < .001 | |
| National norm | -0.18 (.036) | [-0.25, -0.11] | -5.02 | < .001 | -.177 |
| Local norm | -0.01 (.038) | [-0.08, 0.07] | -0.15 | .88 | -.005 |
| Close circle norm | 0.28 (.036) | [0.21, 0.35] | 7.78 | < .001 | .273 |
| *Regression*: $F(3, 1047) = 24.63$, $p < .001$, $R^2_{adj} = .07$ | | | | | |
| **Time 2: Likelihood of breaking self-isolation** | | | | | |
| Constant | 1.85 (.038) | [1.78, 1.93] | 48.63 | < .001 | |
| National norm | 0.11 (.044) | [0.02, 0.20] | 2.48 | .013 | .088 |
| Local norm | 0.06 (.046) | [-0.03, 0.15] | 1.22 | .22 | .045 |
| Close circle norm | -0.34 (.044) | [-0.43, -0.26] | -7.89 | < .001 | -.277 |
| *Regression*: $F(3, 1047) = 21.44$, $p < .001$, $R^2_{adj} = .06$ | | | | | |

### Cross-Lagged Panel Analyses

We used cross-lagged panel analyses to test the longitudinal effect of norms on compliance as well as the reciprocal effect of compliance on perceived norms.[3] Given that the local norm had yielded no significant results in cross-sectional analyses we removed it from the models and focused on the national and the close circle norms. Analyses were conducted in R with the package *lavaan*. The models relied on a structural equation model approach and included both a measurement model (defining the latent variable of local norm) and a structural model. We applied the maximum likelihood methodology (ML) to handle missing data when estimating the model parameters and used a robust maximum likelihood estimator (MLR). Results are summarised in Table 4 and illustrated in Figure 1.

First, the cross-lagged panel models revealed good construct stability across time points, with each variable being strongly related to itself between T1 and T2 ($\beta$s ranging .37-.58, $p$s < .001). Second and more interestingly, the models also showed significant

[3] Following recommendations by Mackinnon et al. (2022), we first assessed measurement invariance. We tested models of configural, metric, scalar, and residual invariance and compared their respective fit to the data. The comparison favoured a metric invariance model (i.e., factor loadings are equivalent across time points). We therefore tested a cross-lagged model using the constraints defined in the metric model (see analysis code for more information).

longitudinal effects of both national and close circle norms on the two indicators of compliance. Just as in the cross-sectional models, the perceived national norm at T1 predicted decreased compliance at T2 (self-reported compliance: $\beta$ = -.09, $p$ = .002; breaking isolation: $\beta$ = .07, $p$ = .024), whereas close circle norm at T1 predicted increased compliance at T2 (self-reported compliance: $\beta$ = .11, $p$ = .002; breaking isolation: $\beta$ = -.16, $p$ < .001). It is important to note that these effects hold longitudinally while controlling for the self-reported behaviour as measured at T1, thereby reducing method bias.

Finally, the longitudinal effect of compliance on close norms was also significant and positive. Specifically, greater compliance at T1 predicted a stronger close circle norm at T2 (effect of self-reported compliance: $\beta$ = .17, $p$ < .001; effect of breaking isolation: $\beta$ = -.20, $p$ < .001). The effect of compliance on national norm, on the other hand, was not significant (effect of self-reported compliance: $\beta$ = -.05, $p$ = .10; effect of breaking isolation: $\beta$ = .002, $p$ = .94).

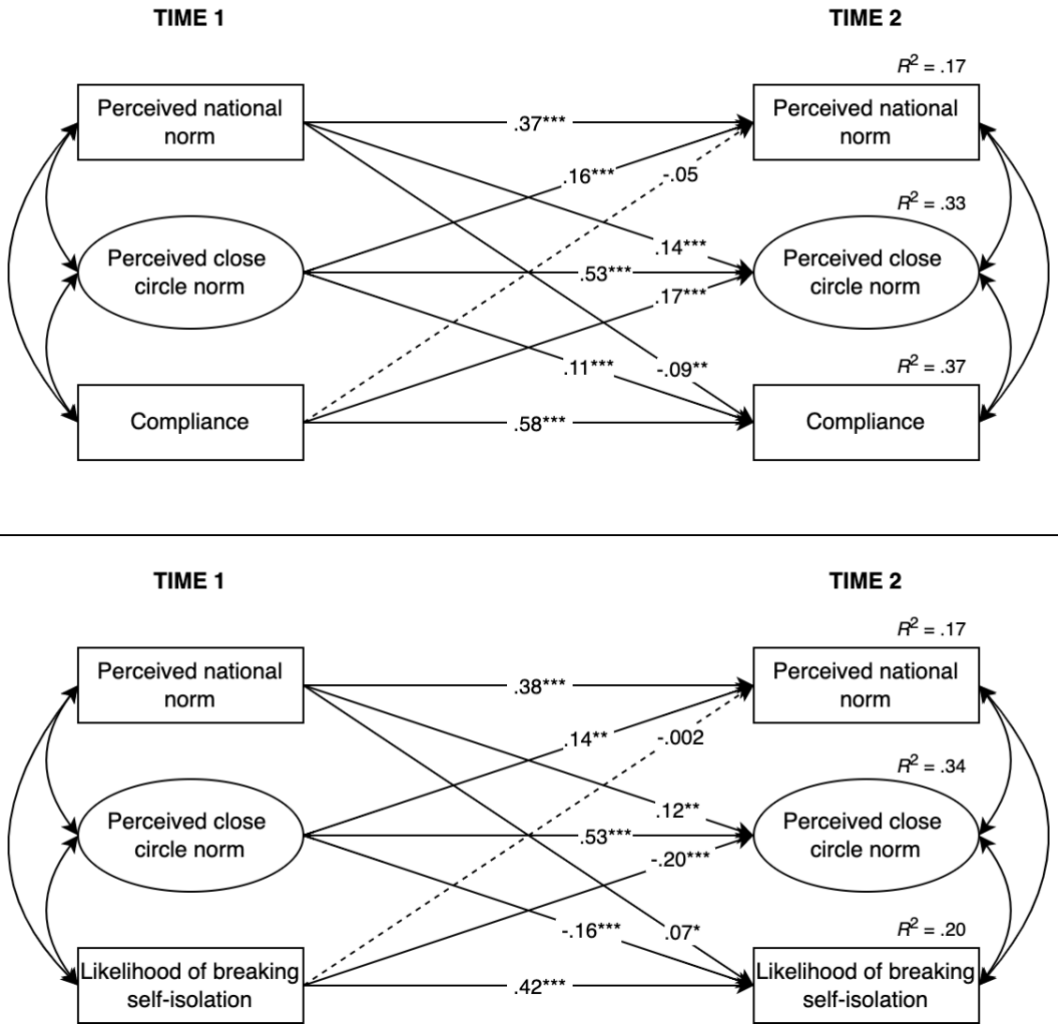
**Table 4.**

*Results of the cross-lagged panel analyses investigating the relationships between perceived national norm, close circle norm, and self-reported compliance (model 1) as well as self-reported likelihood of breaking self-isolation (model 2)*

| | *b* (*SE*) | 95% CI *b* | *z*-test | *p*-value | Standardised estimate *β* |
|---|---|---|---|---|---|
| **Model 1: Compliance** | | | | | |
| Effects on T2 national norm | | | | | |
| ~ T1 national norm | .37 (.035) | [.31, .44] | 10.63 | < .001 | .371 |
| ~ T1 close circle norm | .13 (.033) | [.06, .19] | 3.81 | < .001 | .156 |
| ~ T1 compliance | -.04 (.025) | [-.09, .01] | -1.64 | .100 | -.051 |
| Effects on T2 close circle norm | | | | | |
| ~ T1 national norm | .21 (.057) | [.10, .32] | 3.68 | < .001 | .140 |
| ~ T1 close circle norm | .65 (.061) | [.53, .77] | 10.68 | < .001 | .534 |
| ~ T1 compliance | .20 (.043) | [.12, .29] | 4.65 | < .001 | .168 |
| Effects on T2 compliance | | | | | |
| ~ T1 national norm | -.11 (.034) | [-.17, -.04] | -3.16 | .002 | -.085 |
| ~ T1 close circle norm | .11 (.036) | [.04, .18] | 3.06 | .002 | .108 |
| ~ T1 compliance | .58 (.027) | [.53, .64] | 21.88 | < .001 | .582 |
| **Model 2: Likelihood of breaking self-isolation** | | | | | |
| Effects on T2 national norm | | | | | |
| ~ T1 national norm | .39 (.035) | [.32, .45] | 11.02 | < .001 | .381 |
| ~ T1 close circle norm | .11 (.034) | [.05, .18] | 3.38 | .001 | .139 |
| ~ T1 break self-isol. | .001 (.020) | [-.04, .04] | 0.08 | .94 | .002 |
| Effects on T2 close circle norm | | | | | |
| ~ T1 national norm | .18 (.056) | [.07, .29] | 3.14 | .002 | .116 |
| ~ T1 close circle norm | .65 (.061) | [.53, .77] | 10.70 | < .001 | .530 |
| ~ T1 break self-isol. | -.20 (.037) | [-.27, -.13] | -5.47 | < .001 | -.199 |
| Effects on T2 likelihood of breaking self-isolation | | | | | |
| ~ T1 national norm | .10 (.044) | [.01, .19] | 2.26 | .024 | .066 |
| ~ T1 close circle norm | -.19 (.049) | [-.29, -.10] | -3.92 | < .001 | -.158 |
| ~ T1 break self-isol. | .42 (.035) | [.35, .49] | 11.79 | < .001 | .415 |

**Figure 1.**

*Illustration of the cross-lagged panel analyses investigating the relationships between perceived national norm, close circle norm, and self-reported compliance (top figure) as well as likelihood of breaking self-isolation (bottom figure)*




*Notes*. Coefficients are standardised betas. Dashed lines represent nonsignificant relationships.
* $p < .05$, ** $p < .01$, *** $p < .001$

## Discussion

This paper presents the results of a longitudinal study conducted in the UK during autumn 2020, investigating the relationships between perceived descriptive norms and compliance with health protective behaviour related to the COVID-19 pandemic. Two key strengths of this research allowed us to address gaps in the existing literature: we were able to

test both cross-sectional and longitudinal effects of norms, and to compare and distinguish between the effects of three different norms (i.e., close circle, neighbourhood, and people in the country).

Consistent with past findings (e.g., Chambon et al., 2022; Peterson et al., 2021; Rudert & Janke, 2021; Tunçgenç et al., 2021), we identified a positive effect of the close circle norm (that is, perceived behaviour of one's family and friends): a stronger close circle norm was associated with more compliant behaviour both cross-sectionally and longitudinally. We had expected a less strong effect of the broader national norm (see Chambon et al., 2022) or even no effect (see Farias & Pilati, 2022; Tunçgenç et al., 2021). Surprisingly, the results revealed a significant *reverse* effect of the national norm: a stronger national norm was associated with less compliant behaviour, both cross-sectionally and longitudinally. The intermediate-level norm (neighbourhood) fell in-between these two opposite effects and was not significantly related to compliance.

**Close Circle versus National Norm**

Theoretically, there are different reasons why the close circle norm may have a stronger impact on behaviour. As we noted in the introduction, the close circle arguably constitutes a more relevant and salient group to the self (Christensen et al., 2004; Hogg, 2003) and conforming to its norms can have large positive effects on one's self-esteem (Brewer, 2003), also sustaining inclusion and avoiding derogation or ostracism (Marques et al., 2001). In addition, its perception as more similar and sharing the same social reality with the self might make its behaviour more informative and pertinent to address the uncertainty of the situation (Deutsch & Gerard, 1955; see also Goldstein et al., 2008). Finally, one's behaviour is more visible to the close circle, increasing one's accountability and motivation to comply (Kelman, 1958; Latané et al., 1979); it is also more directly relevant to the health of potentially vulnerable close others.

The same factors would imply a weaker effect of the national norm. “People in general” can be perceived as less relevant and less similar to the self, experiencing different social realities, perhaps facing different risks from COVID-19. They are also less likely to notice one’s non-compliant behaviour and potentially to retaliate. However, as our results revealed, the effect of the national norm was not just less strong; it was actually negative. Therefore, not only may the national norm be a less relevant source to guide one’s behaviour, it may even be that people draw on this information as a justification for their free riding dynamics (Kerr & Bruun, 1983; Olson, 1971). The more that one believes people across the country are engaging in efforts to stop the spread of the virus, the less impact one’s own behaviour might make, perhaps also absolving oneself of responsibility for the national situation (cf. Darley & Latané, 1968) and justifying less compliance whilst still benefiting from the others’ efforts to protect public health. Such dynamics would be accentuated by the lower visibility of one’s personal behaviour by “people in general”, when diluted in the entire national group (Jackson & Harkins, 1985).

**The Cross-Lagged Effect of Compliance on Perceived Norms**

As the cross-lagged panel model revealed, compliance (at T1) also had an effect on the perception of the close circle social norm (at T2), replicating findings from Rudert and Janke (2021)’s study of COVID-19-related behaviours. This cross-lagged effect might reflect two dynamics, one more objective and the other more subjective. Objectively, individuals influence the behaviour of their close circle, just as the close circle exerts an influence on theirs. An awareness of these virtuous dynamics might be reflected in the positive impact of behaviour on the close circle descriptive norm. Second, and more subjectively, motivated to validate and justify their own behaviour, individuals may distort their perception of others’ behaviour (Mullen et al., 1985). The longitudinal link might therefore reflect such a perceptive bias.

**Limitations and Future Directions**

As well as its strengths, some limitations of the present research must be acknowledged. First, we focused our investigation on descriptive norms but did not consider the role of injunctive norms. During the first year of the pandemic, a strong and clear national injunctive norm was continually communicated via mass media insisting that people should follow government regulations and respect social distancing rules. It is possible that some local or close-circle injunctive norms might have been different for some people. Some research suggests that in case of discrepancy, the descriptive norm outweighs the injunctive norm (Cialdini et al., 1990; Neville et al., 2021), especially when uncertainty is high (Gelfand & Harrington, 2015). Yet, others have illustrated that the situation can be more complex, especially when if one's past behaviour is inconsistent with the current norms (Schultz et al., 2007). It will be useful for future studies to investigate further the potential additive or interactive effect of both descriptive and injunctive norms, at different levels of closeness to the self.

Second, the present research did not consider potential moderators of the effect of norms. Past research, including during the pandemic (Tunçgenç et al., 2021), has shown that the influence of a group norm on one's behaviour increases with one's sense of attachment and identification with this group. Divergence in the sense of identification with one's neighbourhood might explain the absence of results at this level of norm in the present study: possibly, only participants strongly attached to their neighbourhood would rely on its descriptive norm. In the same vein, the negative impact of the national norm might disappear for participants with a strong national identity. Indeed, Tunçgenç et al. (2021) observed a positive influence of the descriptive national norm on social distancing behaviour only for those who were strongly identified, or 'fused' with their country.

Third, we were surprised to find no effect of neighbourhood norm. One reason may be that whereas friend and family norms are specific to oneself, and national norms are generic to everyone, neighbourhood norms might align more strongly with national or with family norms, but this depends on the particular neighbourhood. Thus, positive and negative effects in different neighbourhoods might cancel one another out statistically when using individual level data. In future research it would be valuable to explore neighbourhood level effects using a different study design that was able to aggregate to the neighbourhood level.

**Conclusions**

This research highlights the importance of social norms for understanding and potentially influencing individual behaviour during the COVID-19 pandemic. It is widely consistent with previous work conducted both prior to (e.g., Gelfand & Harrington, 2015; Goldstein et al., 2008; Reynolds et al., 2015) and during the pandemic (e.g., Farias & Pilati, 2022; Rudert & Janke, 2021; Tunçgenç et al., 2021), and advances this research by highlighting the reciprocal relationship between descriptive norms and individual behaviour, and by addressing the question of whether norms at different levels have different effects.

In terms of challenges, the present work highlights the potential ironic effects of norms and calls for caution when designing persuasive messages or norm-based interventions aiming to promote health protective behaviour. Not only can negative descriptive norms (i.e., description of the desirable behaviour as adopted by only a minority) dampen one's own behaviour (Goldstein & Cialdini, 2009), positive descriptive norms at a level that is remote from the self may have perverse consequences such as free-riding dynamics. More optimistically, the present findings highlight an avenue for effective influence: designing norm-based interventions that firmly target close circles (Tunçgenç et al., 2021). For example, a strategy of supporting key figures (e.g., those with status or communicative reach) in small networks to adhere overtly to the rules should facilitate a virtuous circle of influence

that encourages their close others to do the same even if merely because of compliance concern, thus speeding up what could otherwise be a lengthy process of norm internalisation.

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Electronic Supplementary Material

**ESM 1.**

*Additional cross-sectional analyses controlling for demographics*

In this document we report the results of additional cross-sectional analyses (investigating the relationships between the three types of norms and indices of compliance) that include demographics as covariates, at each time point. We control for the following variables: age (continuous score, standardised), sex (recoded as: -1 = men, +1 = female, missing value = other or undisclosed), subjective socio-economic status (continuous score, standardised), and political orientation (7-point scale with 1 = Left-wing, 4 = Centre, 7 = Right-wing; treated as continuous score, standardised). Results are reported in the tables below.

**Table 1:** ***Results at T1***

| | *b* (*SE*) | 95% CI *b* | *t*-test | *p*-value | Standardised estimate *β* |
|---|---|---|---|---|---|
| **Time 1: Self-reported compliance** | | | | | |
| Constant | 3.52 (.032) | [3.45, 3.58] | 110.02 | < .001 | |
| National norm | -0.17 (.036) | [-0.24, -0.10] | -4.83 | < .001 | -.169 |
| Local norm | -0.03 (.038) | [-0.10, 0.05] | -0.76 | .45 | -.028 |
| Close norm | 0.24 (.036) | [0.17, 0.31] | 6.62 | < .001 | .238 |
| Age | 0.08 (.033) | [0.02, 0.14] | 2.44 | .015 | .078 |
| Sex | 0.03 (.033) | [-0.03, 0.09] | 0.91 | .36 | .028 |
| Socio-economic status | 0.01 (.032) | [-0.05, 0.07] | 0.27 | .78 | .009 |
| Political orientation | -0.01 (.032) | [-0.07, 0.05] | -0.30 | .77 | -.009 |
| *Regression*: $F(7, 980) = 10.62$, $p < .001$, $R^2_{adj} = .06$ | | | | | |
| **Time 1: Likelihood to break self-isolation** | | | | | |
| Constant | 1.84 (.038) | [1.76, 1.91] | 48.17 | < .001 | |
| National norm | 0.05 (.043) | [-0.03, 0.13] | 1.19 | .23 | .042 |
| Local norm | -0.01 (.045) | [-0.10, 0.08] | -0.30 | .76 | -.011 |
| Close norm | -0.24 (.044) | [-0.32, -0.15] | -5.43 | < .001 | -.195 |
| Age | -0.15 (.039) | [-0.23, -0.07] | -3.85 | < .001 | -.124 |
| Sex | -0.07 (.039) | [-0.14, 0.01] | -1.70 | .089 | -.053 |
| Socio-economic status | 0.05 (.038) | [-0.03, 0.12] | 1.23 | .22 | .039 |
| Political orientation | 0.10 (.038) | [0.03, 0.18] | 2.64 | .008 | .083 |
| *Regression*: $F(7, 980) = 11.11$, $p < .001$, $R^2_{adj} = .07$ | | | | | |

**Table 2:** ***Results at T2***

| | *b* (*SE*) | 95% CI *b* | *t*-test | *p*-value | Standardised estimate *β* |
|---|---|---|---|---|---|
| **Time 2: Self-reported compliance** | | | | | |
| Constant | 3.46 (.033) | [3.40, 3.53] | 106.10 | < .001 | |
| National norm | -0.17 (.037) | [-0.24, -0.10] | -4.56 | < .001 | -.166 |
| Local norm | -0.02 (.039) | [-0.10, 0.05] | -0.58 | .56 | -.022 |
| Close norm | 0.23 (.038) | [0.16, 0.31] | 6.21 | < .001 | .228 |
| Age | 0.12 (.034) | [0.06, 0.19] | 3.68 | < .001 | .121 |
| Sex | 0.003 (.033) | [-0.06, 0.07] | 0.10 | .92 | .003 |
| Socio-economic status | 0.05 (.033) | [-0.01, 0.12] | 1.64 | .101 | .052 |
| Political orientation | -0.07 (.033) | [-0.13, -0.003] | -2.04 | .042 | -.065 |
| *Regression*: $F(7, 936) = 12.27$, $p < .001$, $R^2_{adj} = .08$ | | | | | |
| **Time 2: Likelihood to break self-isolation** | | | | | |
| Constant | 1.86 (.039) | [1.79, 1.94] | 48.05 | < .001 | |
| National norm | .09 (.044) | [.01, .18] | 2.08 | .038 | .075 |
| Local norm | .06 (.047) | [-.03, .15] | 1.26 | .21 | .048 |
| Close norm | -.31 (.045) | [-.40, -.23] | -7.01 | < .001 | -.255 |
| Age | -.12 (.040) | [-.20, -.04] | -3.02 | .003 | -.098 |
| Sex | -.13 (.039) | [-.21, -.06] | -3.38 | < .001 | -.106 |
| Socio-economic status | .01 (.039) | [-.07, .09] | 0.29 | .77 | .009 |
| Political orientation | .15 (.039) | [.08, .23] | 3.95 | < .001 | .124 |
| *Regression*: $F(7, 936) = 15.06$, $p < .001$, $R^2_{adj} = .09$ | | | | | |