


ARTICLE

Can culture beat Covid-19? Evidence that exposure to facemasks with cultural symbols increases solidarity



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Abstract

Facemasks have become integral to everyday life. We propose that exposure to facemasks with a solidarity-related cultural symbol can activate cultural values such as mutual trust and increase corresponding interpersonal perceptions, thereby enhancing collective resilience in the Covid-19 pandemic. In three (two of which preregistered) studies, we examined whether exposure to facemasks with a solidarity-related cultural symbol predicts positive interpersonal perceptions, and whether this depends on death awareness. Across studies, exposure to facemasks with a cultural symbol (either pride flag or National Health Service) increased positive interpersonal perceptions, an index of solidarity, in people for whom this symbol represents a meaningful social identity. This was found whether participants were reminded of death, a neutral experience, or a negative experience. Importantly, in Study 3, exposure to facemasks with a solidarity-related cultural symbol (vs. surgical) led to greater increases in positive interpersonal perceptions when death awareness was high. Together, our findings suggest that wearing facemasks with a cultural symbol that relates to solidarity can be a vehicle for shaping people's personality impressions of others. Applied directions for the activation

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of people's social identities via facemask selection to promote collective resilience in the Covid-19 pandemic are discussed.

KEYWORDS

covid-19, facemasks, social identity, solidarity, terror management theory

BACKGROUND

In the COVID-19 outbreak, facemasks have become integral to everyday life. Currently, wearing facemasks is recommended by the World Health Organization (2021) to suppress COVID-19 transmission (Howard et al., 2021; Wei et al., 2021). With the continuous mutation of the virus, protective measures such as facemask wearing are potentially here to stay (British Academy, 2021). Accordingly, research and theory concerning the psychological effects of facemask exposure (Biermann et al., 2021; Cartaud et al., 2020; Fitousi et al., 2021; Grundmann et al., 2021; Kastendieck et al., 2021; Klucarova, 2021; Parada-Fernández et al., 2022; Rosa et al., 2020; Wu et al., 2021) and the associations attached to facemasks in general (Cheng et al., 2020; Huang et al., 2021; Ji, 2020; Timpka & Nyce, 2021) and to specific types (e.g., surgical) of facemasks (Goh et al., 2020; Klucarova, 2021; Mokdad, 2021; Perach, 2020; Tateo, 2020) are emerging. In this article, we propose that exposure to facemasks with a cultural symbol that relates to solidarity can activate cultural values such as mutual trust and thereby increase interpersonal perceptions compatible with these values (Neville et al., 2021; Vail et al., 2012). In other words, in the COVID-19 pandemic, facemask selection can potentially promote solidarity by affecting people's malleable interpersonal perceptions (Cheng et al., 2020; Elcheroth & Drury, 2020). In three studies, we test whether exposure to facemasks that make salient people's solidarity-related cultural values increases positive interpersonal perceptions, and whether these effects depend on people's awareness of their inevitable mortality.

In this article, we define people's *positive interpersonal perceptions* as positive personality impressions (Rosenberg et al., 1968) of other individuals; we operationalise these perceptions as individuals' perceived positive personality traits (e.g., trustworthy, reliable, Levine et al., 2018; Rosenberg et al., 1968); and view these perceptions as an index of solidarity in the face of COVID-19—a sense of fellow-feeling that unites people against the threat of the virus (Tomasini, 2021).

Positive interpersonal perceptions, solidarity, and collective resilience

The COVID-19 pandemic, declared in March 2020 (World Health Organization, 2020), presented significant challenges for individuals (e.g., Social Metrics Commission, 2020; Wu et al., 2021), intergroup relations (e.g., Jiang et al., 2021; Prosser et al., 2020), and societies (e.g. Abrams et al., 2021; Carothers & Press, 2020; Mazey & Richardson, 2020). In this context, the promotion of collective resilience is a major societal challenge (Elcheroth & Drury, 2020).

Solidarity in the face of COVID-19 (Tomasini, 2021) is key to collective resilience (Elcheroth & Drury, 2020; Jewett et al., 2021), and is tied to how people perceive others (Lalot et al., 2021; Pagliaro et al., 2021). For example, interpersonal perceptions of trust have been positively associated with intentions for discretionary behaviours such as buying supplies for people in need and donating to charities to help fight COVID-19 (Pagliaro et al., 2021) and social cohesion outcomes (Lalot et al., 2021). Forming a positive impression of a person (e.g., "This person is trustworthy") can facilitate other positive personality impressions (e.g., reliable, Rosenberg et al., 1968), and the perception that this person is likely to be collaborative and helpful in times of need (Simpson, 2007). In this way, cues that help form

our impressions of others, for example, indicators of shared group membership, can potentially lead to positive interpersonal perceptions and increased solidarity (“This person and I have shared beliefs and values, so this is a ‘good’ person that I can count on if needed”) (e.g., Kramer & Brewer, 1984; Levine et al., 2005).

People's faces are an important source for inferring people's personality (Todorov et al., 2009; Yan et al., 2015), even when partly covered by facemasks (Cartaud et al., 2020; Rosa et al., 2020; see Fitoussi et al., 2021 for other interpersonal effects of facemasks). Below, we discuss the effects of facemasks on people's interpersonal perceptions and propose that these effects can depend on facemask type.

Interpersonal perceptions of wearers of different facemasks

During a pandemic, any type of facemask-wearing can potentially evoke a sense of social and cultural solidarity that transcends individual self-protection motives (Cheng et al., 2020). However, facemasks vary by type (Goh et al., 2020; Van Gorp, 2021), and different facemasks evoke different associations (Tateo, 2020). Quantitative research on the interpersonal effects of facemasks has thus far focused on surgical (or medical) facemasks (Cartaud et al., 2020; Fitoussi et al., 2021; Grundmann et al., 2021; Kastendieck et al., 2021; Klucarova, 2021; Parada-Fernández et al., 2022; Rosa et al., 2020; Wu et al., 2021), a type of facemask traditionally used to stop bacteria transmission in medical settings (Goh et al., 2020). For example, in two articles, faces with a surgical facemask were rated as more trustworthy in comparison to faces with a neutral emotional expression, whether these faces were of virtual characters (Cartaud et al., 2020) or real-life individuals (Olivera-La Rosa et al., 2020). In another study, exposure to surgical facemasks increased competency perceptions and behavioural intentions (Klucarova, 2021). For current purposes, we define *cultural facemasks* as facemasks that depict a solidarity-related cultural symbol in the form of logo, icon, print, or letters. Next, we discuss two theoretical frameworks—the social identity approach, and terror management theory—for understanding the potential of cultural facemasks to activate solidarity-related cultural values and promote solidarity beyond other facemasks.

Theoretical frameworks for understanding perceptions of cultural facemask-wearers

The social identity approach

The social identity approach is an influential framework in social psychology that construes shared social identity as key to understanding people's interpersonal perceptions and behaviours (van Bavel & Packer, 2021; Hornsey, 2008; Reicher et al., 2010). Building on social identity theory (Tajfel, 1978; Tajfel & Turner, 1979) and social-categorisation theory (Turner et al., 1987, 1994), the social identity approach posits that social groups provide their members with social identity (i.e., how group members are defined) and prescriptions for normative behaviour as a group member. When a social identity is made salient, people use the corresponding group membership to define themselves and others, and act according to the group's norms and values (e.g., van Dick et al., 2009; James & Greenberg, 1989; Levine et al., 2005). For example, in one study, Manchester United football club fans were more likely to intervene to help a (confederate) bystander in distress wearing a Manchester United (vs. rival team and plain) shirt (Levine et al., 2005). In other words, exposure to a shared social identity prime increased actual helping behaviour (Levine et al., 2005), consistent with group-relevant norms (Derbaix & Decrop, 2011). In the context of the COVID-19 pandemic, the activation of a targeted social identity (e.g., national identity) can potentially shape the perceptions of people who subscribe to this identity (“As a Scottish national, I protect my fellow citizens”) and related behaviours such as mask-wearing (Neville

et al., 2021; Scottish Government, 2020). Thus, facemasks that activate a social identity that relates to solidarity (i.e., cultural facemasks) can be a social resource via triggering the provision of social support (Haslam et al., 2022).

Terror Management Theory

Terror Management Theory (TMT; Greenberg et al., 1986) is a psychological theory based on the works of Becker (1971, 1973) and Rank (1941). TMT proposes that the awareness of death is a fundamental motivator of human behaviour and focuses on the cultural mechanisms to manage this awareness. According to TMT, the awareness of death is at the root of an existential conflict unique to humans. On the one hand, like other organisms, humans are motivated to secure their continued existence. On the other hand, due to their developed cognitive capacities (e.g., symbolic thinking), humans are unique in understanding that their existence is inevitably finite. This conflict creates the potential for experiencing acute anxiety, or *terror*, which is managed by investing in two interrelated psychological structures. One structure is cultural worldviews: a set of socially constructed beliefs and values to which an individual prescribes that provide standards for understanding what is valuable and meaningful. TMT maintains that adherence to cultural worldviews holds the promise of either literal (i.e., promise of an after-life) or symbolic immortality in the face of death awareness. The second structure is self-esteem, which TMT posits is achieved by meeting standards of value prescribed by cultural worldviews (Solomon et al., 2004). Since its emergence, TMT has gained international support from hundreds of empirical studies (Burke et al., 2010; Pyszczynski et al., 2015). The replicability of TMT evidence is under ongoing discussion (Chatard et al., 2020; Klein et al., 2019).

One key TMT hypothesis is the Mortality Salience (MS) hypothesis (Rosenblatt et al., 1989), which posits that when people are reminded of their mortality, they display an increased reliance on cultural worldviews and self-esteem to buffer against mortality concerns. For example, when reminded of their mortality, people invest in culturally valued symbols by desiring a job in a company whose logo depicts a national symbol (Wirth-Petrik & Guenther, 2012), showing increased reluctance to inappropriately use cultural objects (Greenberg et al., 1995), and negatively evaluating someone who criticises their country (Greenberg et al., 1990). Thus, evidence shows that the endorsement of cultural symbols is one way to manage the awareness of death and suggests that exposure to cultural symbols after death reminders can affect people's interpersonal perceptions.

MS and adherence to salient cultural values According to the Preliminary Heuristic Model of Positive Terror Management (Vail et al., 2012), when death awareness is high and cultural worldviews are made salient (e.g., by exposure to cultural symbols), these salient worldviews will guide people's psychological defences (Gailliot et al., 2008; Jonas et al., 2008). For example, in one field study, participants who walked through a cemetery (i.e., high death awareness) and were reminded of the value of helping showed increased helping behaviour to a stranger in comparison to those who did not pass by the cemetery (Gailliot et al., 2008). This finding was conceptually replicated using self-report measures of helping, and different mortality and cultural value priming methodologies (Gailliot et al., 2008). In other words, exposure to cultural values affected changes in value-relevant behaviours after death reminders. Additional insight into terror management processes when cultural values are salient comes from TMT-derived models that focus on the management of health threats, that is, the Terror Management Health Model (Arndt & Goldenberg, 2017; Goldenberg & Arndt, 2008), and its application for pandemics (Courtney et al., 2020). The Terror Management Health Model for pandemics (Courtney et al., 2020) construes mask-wearing as a behaviour motivated by both proximal defences (that manage conscious death thought) and distal defences (that manage non-conscious death thought) (Pyszczynski et al., 1999). Mask-wearing can be understood as a protective health-oriented behaviour that aims to reduce conscious perceived risk (proximal

defence). At the same time, mask-wearing, especially cultural facemask-wearing that highlights cultural bases of value that are meaningful to the individual (Arndt & Goldenberg, 2017), can be construed as a health-oriented behaviour that is informed by culture rather than health (distal defence). This view (Courtney et al., 2020) is thus in line with the notion that facemask wearing can potentially shape positive interpersonal perceptions ('I think positively of this cultural-facemask-wearer who is doing the "right thing"') when death is salient. Overall, the above TMT-derived models are compatible with the idea that the activation of cultural values via exposure to a solidarity-related cultural symbol (i.e., on a cultural facemask) after death reminders can increase people's positive interpersonal perceptions.

Together, the above theoretical frameworks support the potential for cultural facemasks to increase positive interpersonal perceptions. Whereas the proposed underlying psychological processes are different, both frameworks share the notion that exposure to cultural symbols can steer people to endorse cultural-symbol-related perceptions. Namely, these effects are potentially driven by social identification with a salient ingroup identity (social identity approach), or by the management of death awareness through the validation of salient cultural worldviews (TMT). Building on these perspectives, in the current article, we examine whether exposure to cultural facemasks increases positive interpersonal perceptions, and whether these increases are affected by death reminders.

The current studies

Cultural facemasks have unique symbolic features that may activate solidarity-related cultural values. The activation of these cultural values has the potential for promoting collective resilience in the current COVID-19 pandemic, for example, via increasing adherence to public health messages (Elcheroth & Drury, 2020). Grounded in the Preliminary Heuristic Model of Positive Terror Management (Vail et al., 2012), we hypothesise that exposure to cultural facemasks will affect people's interpersonal perceptions, particularly when death awareness is high (vs. low). Specifically, we predicted that exposure to facemasks with a solidarity-related cultural symbol will increase people's positive interpersonal perceptions, particularly when death is salient. We test this prediction in three studies using different cultural symbols, that is, pride flag (Study 1), and the UK National Health Service (Studies 2 and 3). Across studies, we targeted participants for whom the cultural symbol under study represents a meaningful social identity. For comparison, we included a no-mask control condition (Studies 1–3) and, to directly compare whether our effects differ by type of facemask, a surgical mask condition (Study 3). For presentation purposes, we report the studies in reversed chronological order.

STUDY 1

In Study 1 (preregistration: osf.io/8ahuy), we examined whether exposure to a cultural facemask increases positive interpersonal perceptions, and whether this depends on death awareness. In the cultural facemask condition, we exposed participants to individuals wearing a facemask with the pride flag. The pride flag is a symbol of societal and communal belongingness (Klapeer & Laskar, 2018; Matsick et al., 2020), which represents a meaningful social identity to those who identify as gay or lesbian (Wolowic et al., 2017). In addition to the high MS condition, we included a neutral control condition, which enabled us to examine whether facemask exposure effects occur in the absence of death reminders. We predicted that exposure to wearers of a pride flag cultural facemask (vs. no mask) will increase positive interpersonal perceptions, particularly when death awareness is high (Vail et al., 2012).

Method

Participants and recruitment

Across studies, we report all measures, manipulations, and exclusions. An a-priori power analysis (on G*Power 3.1.9.2) for ANOVA (main effects and interactions) showed that with an $\alpha = .05$ and power = 0.80, models used to test our hypothesis in a design with four groups require a sample size of 179 to detect our anticipated medium effect size, $f = .25$, comparable to the meta-analytic moderate effect of MS manipulations (Burke et al., 2010). The analytic sample comprised 178 (62% women) users of crowdsourcing platform Prolific aged 18–52 ($M_{\text{age}} = 23.75$, $SD_{\text{age}} = 5.90$) who were US residents, identified as gay or lesbian, and took part in exchange for £1.1. Participants who did not meet the sexual orientation inclusion criterion were excluded from analysis ($n = 22$). The exclusion of six participants who identified the purpose of the study did not change the significance of the main findings. Data collection took place on 28 July 2021. At the time of the study, Centres for Disease Control and Prevention (CDC) guidance (2021b) dictated that only those who have not been fully vaccinated (~50% of US population at the time of the study, Mathieu et al., 2021) should wear facemasks; and strong facemask mandates were not in place in some, but not all, states (Chiwaya, 2021). According to USA COVID-19 daily trends at this time (e.g., 492 new deaths), the time of the study was not a peak time (CDC, 2021a).

Procedure and materials

This online study had a 2 (MS: high, low) \times 2 (facemask: cultural mask, no mask) between-participants design. Participants completed nine filler items on the frequency of general activities (e.g., engaging in hobbies), an attention check, and were randomly allocated to either the high MS condition or a neutral control condition. In the high MS condition, participants completed two open-ended items: ‘Briefly describe the emotions that the thought of your own death arouses in you’ and ‘Jot down, as specifically as you can, what you think will happen to you physically as you die and once you are physically dead’ (Rosenblatt et al., 1989). Control participants completed two parallel items on reading books (Castano et al., 2002). Participants then completed the 20-item Positive and Negative Affect Scales (PANAS; Watson et al., 1988). Items were rated on a scale ranging from 1 (very slightly or not at all) to 5 (extremely). A total mean score was computed for *positive affect* (10 items; Cronbach's $\alpha = .88$) and *negative affect* (10 items; Cronbach's $\alpha = .89$). In line with the TMT paradigm, the PANAS served as a delay and distraction task because research has shown that MS effects occur when primed death thoughts are outside of consciousness and no longer attended to (Greenberg et al., 1994). Next, participants were randomly allocated to a facemask condition, in which they were exposed to four pictures of the same four individuals, who wore (1) no facemask or (2) a cultural facemask with the pride flag. The pictures were selected from the Chicago Face Database (Ma et al., 2015) with the inclusion criteria of mid-range ratings of attractiveness and honesty, set to rule out confounding baseline effects (see Olivera-La Rosa et al., 2020 for similar procedures). All pictures depicted neutral emotional expressions and were presented in equal size and resolution. For the masked conditions, we digitally added a facemask to each face. Participants were instructed that they could take as long as they needed to look at the pictures. After each picture, participants rated their *interpersonal perceptions* concerning the person in the picture (e.g., ‘To me, this person seems trustworthy’; Cronbach's α per picture ranged .88–.92) on a scale ranging from 1 (strongly disagree) to 9 (strongly agree). This measure included adjectives that represent positive interpersonal perceptions (Levine et al., 2018; Rosenberg et al., 1968), namely, trustworthy, good-natured, dishonest (reverse-coded), reliable, and sincere. A mean composite score was computed such that a higher score represented higher levels of positive interpersonal perceptions. Finally, participants were asked what in their opinion the purpose of the study was, provided background details including concerning

COVID-19 (e.g., receiving a COVID-19 diagnosis), and were thanked and debriefed. The complete protocols of Studies 1–2 are available via the studies' preregistrations.

Results

MS and affect

ANOVA analyses showed no significant differences in positive affect and in negative affect between participants in the high (vs. low) MS condition, $p > .51$, $p = .06$, respectively. Thus, positive affect and negative affect did not meet our preregistered criteria for inclusion as covariates.¹

Main analyses

The effects of death reminders and facemask exposure on people's positive interpersonal perceptions

We ran a two-way ANOVA with MS condition (dummy coded; 1 = high MS) and facemask condition (dummy coded; 1 = cultural pride flag facemask) as the independent variables. The dependent variable was positive interpersonal perceptions. Participants who were exposed to pride flag facemasks had significantly more positive interpersonal perceptions, $M = 6.84$, $SD = 1.24$, in comparison to those in the no facemask condition, $M = 5.03$, $SD = .84$, $F(1, 174) = 129.95$, $p < .001$, $\eta^2_p = 0.43$. There was no significant difference in positive interpersonal perceptions between participants who were reminded of death, $M = 5.96$, $SD = 1.26$, and those in the neutral control condition, $M = 5.89$, $SD = 1.53$, $p = .74$. The interaction between MS condition and facemask condition was not significant, $p = .56$ (Figure 1). Thus, cultural (pride) facemask exposure increased positive interpersonal perceptions across MS conditions.

Discussion

The findings of Study 1 showed that exposure to cultural pride flag facemasks increased positive interpersonal perceptions of mask-wearers, whether participants were reminded of death or a neutral topic. These findings provide initial support for our idea that exposure to cultural facemasks can increase solidarity by making salient solidarity-related cultural values. Nonetheless, Study 1 did not include a control group of a non-cultural facemask, and this limits our ability to infer that the findings are driven by exposure to the pride flag rather than reflect endorsement for mask wearing, behaviour at times mandated during the pandemic. Importantly, mixed state-level facemask mandates and CDC guidance at the time of the study suggest that the increased positive perceptions of cultural mask wearers do not reflect positive evaluations of people who comply with facemask mandates. In addition, the finding of Study 1 were obtained using a cultural symbol that represents a meaningful social identity for a minority of the population (Jones, 2021). Accordingly, in Study 2, we examine whether these effects conceptually replicate using a different cultural symbol that has a wider, national appeal.

¹Considering evidence that MS induces changes in fear (Lambert et al., 2014), we explored this potential effect using two PANAS items that indexed fear (*scared*, *afraid*). These items were highly correlated across studies, $r_{Study1} = .79$, $r_{Study2} = .74$, $r_{Study3} = .81$, all $ps \leq .01$, and were averaged to create a fear index in each study. Across studies, MS increased the experience of fear: in Study 1, participants who were reminded of death had significantly higher fear scores, $M = 2.06$, $SD = 1.05$, in comparison to those in the neutral control condition, $M = 1.69$, $SD = 1.06$, $F(1, 176) = 5.21$, $p = .02$; in Study 2, participants who were reminded of death had significantly higher fear scores, $M = 1.72$, $SD = 0.83$, in comparison to those reminded of pain, $M = 1.45$, $SD = 0.71$, $F(1, 196) = 5.72$, $p = .02$; in Study 3, participants who were reminded of death had significantly higher fear scores, $M = 1.72$, $SD = 0.83$, in comparison to those in the pain control condition, $M = 1.85$, $SD = 1.16$, $F(1, 216) = 8.92$, $p = .003$. To rule out the possibility that our effects are due to fear, we re-ran our analyses with fear as a covariate. Importantly, across studies, the inclusion of fear as a covariate did not change the significance of our main findings.

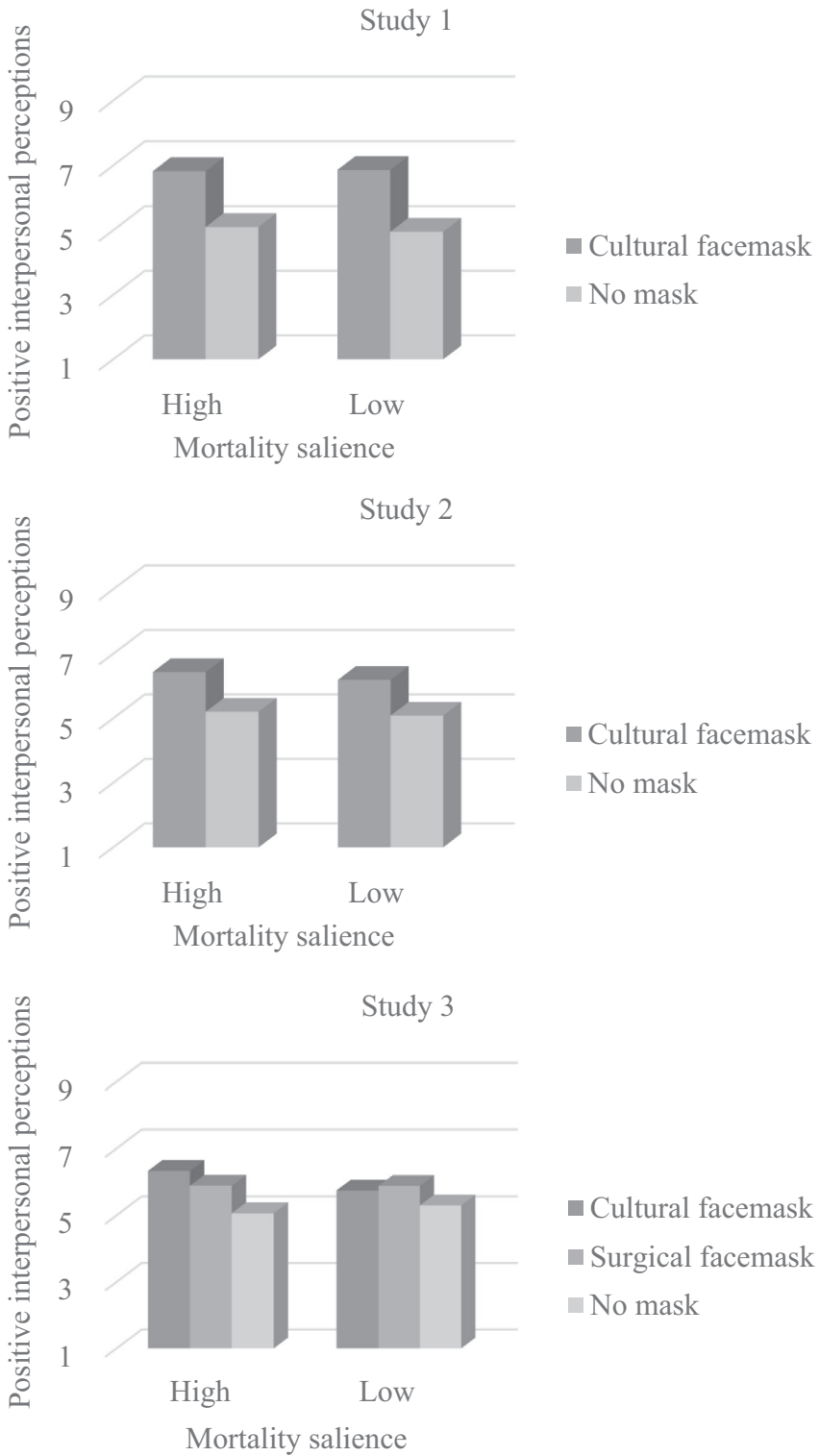


FIGURE 1 The interaction between MS and facemask exposure on positive interpersonal perceptions in Studies 1–3

STUDY 2

In Study 2 (preregistration: osf.io/jd24t), we tested our predictions using cultural facemasks with a symbol of solidarity and national identity in the UK, the National Health Service (NHS). The NHS stands for solidarity as seen, for example, in the weekly UK-wide ‘clap for our carers’ salutation to NHS workers in the early months of the COVID-19 outbreak (Tomasini, 2021). In the same vein, the NHS represents national pride as seen, for example, in the overwhelming support (84%) for the belief that ‘NHS is one of the best health systems in the world’ in the English public during the second national lockdown (Duffy, 2020). In addition, in Study 2, we replaced the neutral control condition with a negative one (i.e., pain), standard in TMT literature. We hypothesised that participants in the NHS facemask (vs. no mask) condition would show higher levels of positive interpersonal perceptions, particularly when MS is high (Vail et al., 2012).

Method

Participants and recruitment

The power analysis was identical to Study 1. The analytic sample comprised 198 (64% female) users of crowdsourcing platform Prolific aged 18–78 ($M_{\text{age}} = 33.83$, $SD_{\text{age}} = 12.64$) who had a UK nationality, and took part in exchange for £1.3. One participant who did not meet the UK nationality inclusion criterion was excluded from analysis. The exclusion of 23 participants who identified the purpose of the study did not change the significance of the main findings. Data collection took place on 9 June 2021 following the easing of COVID restrictions (e.g., removal of requirement to wear facemasks in classrooms) as part of Step 3 of the UK’s roadmap out of lockdown (UK Government, 2021b). According to data on UK COVID-19 trends (e.g., 7,540 reported cases), this was not a peak time (UK Government, 2021a).

Procedure and materials

This online study had a 2 (MS: high, low) \times 2 (facemask: cultural mask, no mask) between-participants design. Participants completed three filler items on the frequency of general activities, an attention check, and were randomly allocated to a MS condition. The high MS condition was identical to Study 1. In the low MS condition, participants completed two parallel items on the experience of extreme physical pain (Juhl et al., 2010). Participants then completed the PANAS, which served as a delay and distraction task (Greenberg et al., 1994). Next, participants were randomly allocated to a facemask condition in which they were exposed to four pictures of the same four individuals, who either wore no facemask or a cultural NHS facemask (Figure 2), and rated their *interpersonal perceptions* concerning the person in the picture (as in Study 1). To increase stimulus variability (Judd et al., 2012), in this study, we used pictures of individuals different than those shown in Study 1 (Cronbach’s α per picture ranged .84–.92), applying the same procedure. Finally, participants were asked what in their opinion the purpose of the study was, provided background details including concerning COVID-19 and were thanked and debriefed.

Results

MS and affect

ANOVA analyses showed no differences in positive affect or negative affect between participants in the high (vs. low) MS condition, $p = .62$, $p = .08$, respectively. Thus, positive affect and negative affect did not meet our preregistered criteria for inclusion as covariates.



FIGURE 2 Examples of pictures presented in the different facemask conditions: (a) no mask (Studies 2–3), (b) surgical mask (Study 3), and (c) cultural NHS mask (Studies 2–3)

Main analyses

The effects of death reminders and facemask exposure on people's positive interpersonal perceptions

We ran a two-way ANOVA with MS condition (dummy coded; 1 = high MS) and facemask condition (dummy coded; 1 = cultural NHS facemask) as the independent variables. The dependent variable was positive interpersonal perceptions. Participants who were exposed to NHS facemasks had significantly more positive interpersonal perceptions, $M = 6.31$, $SD = 1.27$, in comparison to those in the no facemask condition, $M = 5.14$, $SD = .83$, $F(1, 194) = 58.60$, $p < .001$, $\eta^2_p = 0.23$. There was no significant difference in positive interpersonal perceptions between participants who were reminded of death, $M = 5.81$, $SD = 1.21$, and those reminded of pain, $M = 5.64$, $SD = 1.23$, $p = .24$. The interaction between MS condition and facemask condition was not significant, $p = .69$ (Figure 1). Thus, cultural (NHS) facemask exposure increased positive interpersonal perceptions across MS conditions.

Discussion

The findings of Study 2 showed that cultural NHS facemask (vs. no mask) exposure increased positive interpersonal perceptions across MS conditions. Together, the findings of Studies 1–2 show provide novel evidence in support of our idea that exposure to cultural facemasks can increase solidarity. Specifically, the findings of Studies 1–2 converged in showing the effects of exposure to a facemask with a cultural symbol, whether pride flag or NHS, on positive interpersonal perceptions. These effects occurred whether participants were presented with a death, negative, or neutral reminder. Study 2 did not include a non-cultural facemask control group. However, data collection followed the easing of COVID restrictions in the UK. This suggests that, as in Study 1, the findings do not reflect endorsement of mask wearing guidance. A related issue is that the design of Studies 1–2 did not enable testing whether cultural facemasks are superior to other facemasks in eliciting positive interpersonal perceptions. In Study 3, we included surgical facemasks as an additional comparison condition.

STUDY 3

In Study 3, we examined whether exposure to different facemasks (i.e., cultural, surgical) increases positive interpersonal perceptions, and whether this depends on death awareness. We predicted that exposure to wearers of an NHS cultural facemask will increase positive interpersonal perceptions, particularly when death awareness is high (Vail et al., 2012). Importantly, Study 3 included both a no-mask control

condition and a non-cultural facemask control condition, enabling us to directly compare whether our effects differ by type of facemask.²

Method

Participants and recruitment

An a-priori power analysis (on G*Power 3.1.9.2) for ANOVA (main effects and interactions) showed that with an alpha = .05 and power = 0.80, models used to test our hypothesis in a design with six groups require a sample size of 211 to detect our anticipated medium effect size, $f = .25$ (Burke et al., 2010). The analytic sample comprised 218 (82% female) UK university students aged 18–42 ($M_{\text{age}} = 19.87$, $SD_{\text{age}} = 2.12$) who had a UK nationality, and took part in exchange for course credit. Participants who did not meet the UK nationality inclusion criterion were excluded from analysis ($n = 19$). The exclusion of two participants who identified the purpose of the study did not change the significance of the main findings. Data collection took place between 28th of January and 28th of April, 2021, following the start of the third national lockdown during which government advised people to ‘stay home’ and did not provide any explicit facemask guidance (Brown & Kirk-Wade, 2021). The number of COVID-19 cases in the UK peaked in January, 2021 and majorly declined by April, 2021 (UK Government, 2021a).

Procedure and materials

This online study had a 2 (MS: high, low) \times 3 (facemask: no mask, surgical mask, cultural mask) between-participants design. Participants completed three filler items on the frequency of general activities, an attention check, and were randomly allocated to a MS condition (the experimental and control condition were identical to Study 2). Participants then completed the PANAS (Watson et al., 1988), which served to create a delay and distraction (Greenberg et al., 1994). Next, participants were randomly allocated to a facemask condition in which they were exposed to and rated *interpersonal perceptions* of four individuals who wore (1) no facemask, (2) a surgical facemask, or (3) a cultural NHS facemask (Figure 2). In this study, we used pictures of the individuals shown in Study 2 and followed the procedure described in Study 1. Finally, participants were asked what in their opinion the purpose of the study was, provided background details including concerning COVID-19, and were thanked and debriefed.

Results

MS and affect

ANOVA analyses showed that participants in the high MS condition had increased positive affect, $M = 23.06$, $SD = 7.71$, in comparison to those in the low MS condition, $M = 21.13$, $SD = 6.92$, F

²To explore the possibility of individual differences in the management of death awareness after exposure to facemasks (Kelley et al., 2015; Olivera-La Rosa et al., 2020), Study 3 included a measure of disgust sensitivity (Tybur et al., 2009). In addition, because the NHS is a symbol of national identity (Stubley, 2020), and because death reminders can increase people's optimism when their national identity is salient (Dechesne et al., 2000), we further examined the possibility that exposure to cultural facemasks after death reminders will increase people's optimism. These supplementary analyses showed null effects and therefore measures and results are briefly reported herein: Participants' first assessment was the 7-item pathogen disgust sensitivity scale, a subscale of the Three Domain Disgust Scale (Tybur et al., 2009). Following the interpersonal perceptions measure, participants completed a 3-item measure of optimism based on the Revised Life Orientation Test (Scheier et al., 1994), modified to evaluate state optimism (Kluemper et al., 2009). An ANOVA analysis testing the effects of MS condition and facemask condition on optimism showed no significant main or interaction effects, all $ps > .66$. In linear regressions with 1. positive social perceptions and 2. optimism as the dependent variable, there were no significant 3-way interactions between pathogen disgust sensitivity, MS condition, and facemask condition on positive interpersonal perceptions, and on optimism, all $ps > .10$.

(1, 216) = 3.79, $p = .053$. Also, participants in the high MS condition had increased negative affect, $M = 18.44$, $SD = 8.41$, in comparison to those in the low MS condition, $M = 16.45$, $SD = 6.91$, $F(1, 216) = 3.65$, $p = .057$. To rule out the possibility that our effects are due to affect, we re-ran subsequent analyses with positive affect and negative affect as covariates. This inclusion did not change the significance of the main findings.

Main analyses

We ran a two-way ANOVA with MS condition (dummy coded; 1 = high MS) and facemask condition (dummy coded; 1 = cultural NHS facemask) as the independent variables. The dependent variable was positive interpersonal perceptions.

The effects of death reminders and facemask exposure on positive interpersonal perceptions

In our analysis of the effects on positive interpersonal perceptions, the only significant main effect was for facemask condition, $F(2, 212) = 17.54$, $p < .001$, $\eta_p^2 = 0.14$. As hypothesised, there was a significant interaction between MS condition and facemask condition, $F(2, 212) = 3.69$, $p = .03$, $\eta_p^2 = 0.03$ (Figure 1). Means (SD s), sample size per cell, and significant differences in positive interpersonal perceptions are presented in Table 1.

Simple effects analyses showed that within the cultural facemask condition, participants who were reminded of their mortality had significantly more positive interpersonal perceptions in comparison to those in the low MS condition, $p = .01$. Within the no mask and surgical facemask conditions, there were no significant differences among participants in the high (vs. low) MS condition, $p = .29$, $p = .98$, respectively. Thus, in line with our predictions, facemask exposure increased positive interpersonal perceptions among participants who were reminded (vs. not reminded) of their mortality, but only in the cultural facemask condition (Table 1). Looked at differently, within the high MS condition, participants who viewed the cultural facemask had significantly more positive interpersonal perceptions in comparison to those in the surgical facemask, $p < .001$, and no facemask, $p = .04$, conditions. Also, participants in the surgical facemask condition had significantly more positive interpersonal perceptions in comparison to those in the no mask condition, $p < .001$. Within the low MS condition, participants in the no mask condition had significantly less positive interpersonal perceptions in comparison to those in the cultural facemask, $p = .03$, and surgical facemask, $p = .01$, conditions (Table 1). There were no differences between participants in the cultural facemask and surgical facemask conditions, $p = .55$. Thus, whereas exposure to cultural and surgical facemasks (vs. no mask) led to comparable increases in positive interpersonal perceptions when MS was low, cultural facemasks led to greater increases when MS was high.

TABLE 1 Means (SD s), sample size per cell, and significant differences in positive interpersonal perceptions

	Facemask		
	Cultural ^{a,b,c}	Surgical ^c	No mask
	<i>M(SD), n</i>		
MS			
High	6.33 (0.95), 34	5.88 (1.06), 39	5.06 (0.62), 34
Low	5.74 (0.94), 38	5.88 (1.12), 33	5.29 (0.82), 40

^aSignificant difference between high and low MS conditions.

^bSignificant difference in comparison to no mask and surgical facemask conditions in the high MS condition.

^cSignificant difference in comparison to no mask condition in the low MS condition.

Discussion

In Study 3, we tested whether exposure to wearers of an NHS cultural facemask (vs. surgical and no mask) increases positive interpersonal perceptions, an index of solidarity, particularly when death awareness is high. In line with the evidence obtained in Studies 1–2, the findings of Study 3 show that exposure to cultural facemasks (vs. no mask) increased positive interpersonal perceptions whether death awareness was high or low. Also, the findings of Study 3 show that exposure to cultural facemasks increased positive interpersonal perceptions in comparison to surgical facemasks, but only when death awareness was high. Overall, the findings support our TMT-derived idea that the cultural, but not surgical, facemasks carry symbolic features that can increase solidarity when people are reminded of death (Vail et al., 2012).

GENERAL DISCUSSION

In three studies, exposure to facemasks with a cultural symbol increased positive interpersonal perceptions. This was found when exposing participants to individuals wearing pride flag (Study 1) and NHS (Studies 2–3) cultural facemasks, and whether participants were reminded of death, a neutral experience, or a negative experience. Importantly, whereas exposure to cultural and surgical facemask led to comparable increases in positive interpersonal perceptions when death awareness was low, exposure to cultural facemasks led to greater increases when death awareness was high (Study 3). The current findings thus go beyond previous evidence on the effects of surgical facemask exposure on interpersonal perceptions (Cartaud et al., 2020; Olivera-La Rosa et al., 2020) and demonstrate that the psychological effects of exposure to facemasks can differ by type of mask. Together, our findings show that wearing cultural facemasks increases positive interpersonal perceptions, an index of solidarity, in some cases more so than surgical facemasks.

Across studies, exposure to facemasks with a cultural symbol increased positive interpersonal perceptions in people for whom this symbol represents a meaningful social identity. This was found using different sets of pictures (Judd et al., 2012), selected to rule out the possibility of baseline differences in trustworthiness based on norming data (Ma et al., 2015). From a social identity approach perspective (Neville et al., 2021), it is possible that the activation of a meaningful solidarity-related social identity increased people's positive interpersonal perceptions of others. Future research could include measures of social identification (e.g., Postmes et al., 2013) to directly examine whether identification with the targeted ingroup mediates the relationship between cultural facemask exposure and positive interpersonal perceptions.

As hypothesised, exposure to cultural (vs. surgical) facemasks led to greater increases in positive interpersonal perceptions when death awareness was high (Study 3). These findings are consistent with the TMT perspective (Vail et al., 2012) that people can manage the awareness death by adhering to salient cultural worldviews (Gailliot et al., 2008; Jonas et al., 2008). Also, it is possible that cultural, but not surgical, facemasks reminded people of enduring human creativity that embodies key cultural values (e.g., beauty) in the face of death, thereby affirming people's symbolic, long-lasting existence as cultural members (Perach, 2020; Perach & Wisman, 2019). In other words, the findings of Study 3 suggest that exposure to cultural facemasks can activate terror management processes that relate to humans' unique capacity for culture (Greenberg et al., 1986), with the potential for enhancing collective resilience. Nonetheless, in Studies 1–2, we found no support for our TMT-derived hypothesis, such that it is too early to draw strong conclusions concerning the association between death reminders, cultural facemask exposure, and positive interpersonal perceptions. One possibility relating to the findings of Studies 2–3 is that public support for the NHS has shifted over the course of the pandemic. However, there are multiple indications of public NHS support during 2020 (Duffy, 2020; itvnews, 2020; Tomasini, 2021) and the shared meanings attached to cultural symbols do not readily fluctuate (Danesi & Perron, 1999), suggesting that differences in the effects of death reminders in Studies 2 and

3 are not due to changes in public perceptions of the NHS. Also, peak COVID-19 times can involve chronic death salience (Pyszczynski et al., 2020), which can potentially hinder the manifestation of the effects of death reminders. However, Studies 1–2 data collection took place during non-peak times, suggesting that this is an unlikely account for our findings. Future research could examine whether the interpersonal effects of exposure to cultural facemask after death reminders depends on type of death reminders (i.e., COVID-19-related, Courtney et al., 2021).

Practical implications

Our findings that exposure to cultural facemasks increased positive interpersonal perceptions suggest that the facemasks that people choose to wear can have important social implications (Elcheroth & Drury, 2020). For example, the delivery of public health messages using figures that wear a cultural facemask could potentially increase facemask use among targeted social groups (Elcheroth & Drury, 2020). In addition, the use of cultural facemasks can potentially serve to inspire solidarity and positive intergroup relations in settings of potential social conflict such as protests (Nassauer, 2019) and sport events (Newson, 2017), for example, via the activation of a superordinate (e.g., national) social identity (Levine et al., 2005; Neville et al., 2021). Finally, our findings suggest that the use of cultural facemasks can increase positive interpersonal perceptions towards staff in hospitals and health clinics (where death awareness is arguably high), thereby potentially serving to prevent abuse towards medical staff in the COVID-19 pandemic (Mahase, 2021). Future research incorporating measures of people's interpersonal perceptions and behaviours is needed to examine whether the current findings extend to these suggested applications.

Limitations and future directions

The three studies reported in this article, two of which preregistered, provide novel evidence that different cultural facemasks increase positive interpersonal perceptions, an index of solidarity. The current examination of different theoretical explanations promotes integrative social psychology science (Mather, 2007). For example, future research could examine whether the effects of cultural facemasks exposure after death reminders are more pronounced among those who more strongly subscribe to the cultural worldviews made salient—a notion compatible with both social identity (Lalonde, 2002) and terror management (Schimmel et al., 2006) processes. Nonetheless, this research is not without limitations. Our TMT-derived hypothesis was supported in one of the three studies. In view of current discussion concerning the replicability of TMT effects (Chatard et al., 2020; Klein et al., 2019), future replications of the finding that exposure to cultural (vs. surgical) facemasks increases positive interpersonal perceptions when death is salient are needed. A related point is that none of our studies included a control condition of facemask with a non-solidarity-related cultural symbol; the inclusion of such a control mask, for example, using symbols of hate (Anti Defamation League, 2021) in studies of populations who do not subscribe to the worldviews that these symbols represent, is a direction for future research. Also, future studies could examine whether solidarity gains due to the activation of social identities via cultural facemask exposure are more pronounced among ingroup (vs. outgroup) members (Levine et al., 2005). In addition, mask-wearing can signal mask-wearers' individual beliefs (e.g., belief in science, Ike et al., 2020), thereby affecting people's interpersonal perceptions. Of note, in Studies 2–3, we used a prime of national identity, a major contributor to the formation of individual beliefs (Akaliyski et al., 2021), and across studies, strong facemask mandates were not in place at the time of data collection (in Study 1 this refers to some, but not all, state-level mandates, Chiwaya, 2021), thereby reducing potential confounding effects relating to these mandates.

CONCLUSIONS

This article provides empirical support to the idea that cultural facemasks are not simply a fashion accessory, but rather a vehicle for shaping people's personality impressions of others (Perach, 2020). In three studies, we have used different methodologies in a variety of populations, and have shown that people's faces are an important source for inferring character (Todorov et al., 2009) when wearing facemasks with solidarity-related cultural symbols. Importantly, cultural facemasks increased positive personality impressions of others, in some cases beyond surgical facemasks. Thus, the current findings raise novel applied directions for the activation of people's social identities via facemask selection to promote collective resilience in the COVID-19 pandemic and beyond.

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AUTHOR CONTRIBUTION

Rotem Perach: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Supervision; Validation; Visualization; Writing – original draft; Writing – review & editing. **Maliyana Limbu:** Conceptualization; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Writing – review & editing.

OPEN RESEARCH BADGES



This article has been awarded Open Data, Open Materials, Preregistered Badges. The materials of Study 1 and Study 2 are publicly accessible via the Open Science Framework at <https://osf.io/8ahuy/> (Study 1), and <https://osf.io/jd24t/> (Study 2).

DATA AVAILABILITY STATEMENT

The data that support the findings of this research are openly available in figshare at https://figshare.com/projects/Can_culture_beat_Covid-19_Data_and_syntax/127592.

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