Trust in the New Normal: The Effect of Face Mask Wearing on Perceived Trustworthiness

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Abstract: Interpersonal trust is a multifaceted concept that has changed and become integral in everyday interactions throughout the Coronavirus pandemic. Recent pandemic-era research on how wearing face masks affects interpersonal trust has yielded inconclusive results. This study attempted to extrude the true effect through a survey that presented participants with questions referencing masked and non-masked digital faces. Eighty-eight participants were asked to rank how likely the digital masked and non-masked faces were to possess various socially desirable characteristics as a means of creating an overall “trustworthiness score.” The findings were significant and suggest that participants perceived those who wear a face mask to exhibit more socially desirable characteristics. This finding is possibly due to the perceived protection from disease that participants feel with masked target faces. The finding suggests that wearing a face mask not only protects one’s physical wellbeing, but also promotes an increased social standing.

Introduction

Trustworthiness is defined as being vulnerable to someone’s ideas, actions, and feeling comfort in how the outcome of that situation will be (Wilkins, 2018). Wilkins (2018) defines trustworthiness as a more personal version of someone being “reliable.” Trust is a fundamental component to intersocial interaction and provides the basis for stable relationships in both our personal and professional lives. During and after the height of the Coronavirus pandemic, trust has become essential to navigating society. The pandemic has put strain on people in numerous ways from factors including offset of sleep cycles to a dramatic increase in depressive symptoms (Giuntella et al., 2021). This is further complicated by face mask wearing as a form of distancing from one another. Face mask wearing has had negative intersocial implications and the lack of facial cues has challenged our ability to accurately understand one another. Being physically close with others and loved ones was also discouraged during the pandemic, creating a sense of fear of interactions with other
people (Schimmenti et al., 2020). Understanding and being able to trust others is essential to a functioning society.

Trust is a complex concept that researchers have attempted to study in different ways. One method by Uslaner (2000) simplified interpersonal trust into “strategic trust” (a form of trust in someone familiar) and “moralistic trust” (a trust in someone who is unfamiliar). There are several key elements that help shape the concept of interpersonal trust according to Simpson (2007). Simpson identified four factors that are the foundation of interpersonal, more specifically relational trust: how a person’s partner acts in situations that test trust (“trust-diagnostic”), the frequency and creation of those situations, individual characteristics of self-esteem and attachment styles, and the overall interaction of two individuals in a “trust-diagnostic” situation (Simpson, 2007). This framework for achieving interpersonal trust is time-consuming and not always possible. Instead, “moralistic trust” (Uslaner, 2000) seems to guide a significant portion of human interaction.

Quick, everyday interactions require “moralistic trust” (Uslaner, 2000). It has been shown that rapid judgements of someone’s character are affected by variation in expression (Hassin & Trope, 2020). Hassin and Trope (2000) found that when ambiguous text information was presented along with a picture of an unconfident person, participants ranked the person as being weak. When this same ambiguous text was presented with a picture of a person expressing confidence, the text was interpreted as powerful (Hassin & Trope, 2000). This effect has also been shown when no additional text is present. Ledesma et al. (2020) found that when presenting participants with pictures of potential Uber drivers, the facial expressions of those drivers, smiling or not smiling, significantly impacted perceived trustworthiness. Smiling drivers were significantly more likely to be ranked as trustworthy than their nonsmiling counterparts (Ledesma et al., 2020).

Snap judgements and issues of trust have become a more integral part of navigating an increasingly fearful pandemic society (Schimmenti et al., 2020). Kujawa et al. (2020) developed a pandemic stress questionnaire (PSQ) which measured if participants had experienced disruption in the areas of “general life disruption, interpersonal, financial, education/professional goals, health-self, and health-others” (Kujawa et al., 2020). For events experienced, participants were asked to rank the event on a 5-point Likert-scale from 1 being “not at all bad” to 5 being “extremely bad” and found that many participants experienced stressors including limited social interactions, economic hardship, and a lack of basic household goods. Indicating having experienced PSQ events was also correlated with increased depression and anxiety as measured by the PHQ-9 and the Generalized Anxiety Disorder 7 questionnaire (GHD-7) (Kujawa et al., 2020). The Coronavirus pandemic has increased the mental adversity people face with 77% of a global sample indicating stress and 60% indicating anxiety (Varma et al., 2021). It is estimated that roughly 12% of the U.S. population has struggled with social
anxiety disorder at some point (Kessler et al., 2005). A common belief of those with social anxiety is that their voice will not be heard, perhaps exacerbated by the thought that wearing a face mask may muffle one's voice (Saint & Moscovitch, 2021). With the increase in stressors due to the pandemic and anxiety possibly perpetuated by face mask wearing, there seems to be a duality to the outcomes of face mask usage.

Prior to the pandemic, face mask wearing was uncommon in the United States. Face mask usage dramatically increased during the height of the pandemic and was worn by 75% of individuals in multiple U.S. states between May and October of 2020 (Fischer et al., 2021). While this decreased the likelihood of disease transmission, it increased the likelihood for inaccurate understanding of emotions between people. Grundmann et al. (2021) found that face mask wearing deprived social situations of important facial cues (e.g., mouth movements). This caused a significant decrease in facial emotion recognition in adults, with older adults misidentifying the emotions of a target individual more than 50% of the time (Grundmann et al., 2021).

This relationship between the importance of facial cues in making judgements about character, specifically trust, and the lack of those facial cues is central to this research. There has been an increased focus on this topic in recent research. Malik et. al (2021) found a negative correlation between face mask usage and trustworthiness. Other researchers suggest a positive correlation between the two (Cartaud et al., 2020). This discrepancy can be accounted for by the uncertainty in what defines trustworthiness. Participants may be ranking a masked target person or face as more trustworthy because of the perceived disease preventative benefits that wearing a face mask has. Others may rank a masked target person or face as less trustworthy because they cannot identify the target’s expression.

This study attempted to disentangle these two possible explanations for perceived trust or the lack thereof in a pandemic world; perceived disease protection and the inability to understand facial expressions. A convenience sample of participants was taken from University of Minnesota - Twin Cities students and other various off-campus colleagues. Participants were presented with a survey that included digital images of masked and non-masked target faces that varied in race and gender. The survey asked a variety of questions assessing participants’ overall trustworthiness of the target face. Each participant was exposed to both masked and non-masked target face conditions. We hypothesized that when a participant viewed a target face wearing a mask, the perceived trustworthiness of that target will decrease in comparison to those targets who are unmasked.

**Methods**

**Participants**

Participants were recruited through convenience sampling by distributing a link to the survey across amongst college students, friends, and coworkers. This was done via the use of email and text messaging. There were 88 participants in total whose
ages ranged from 18 to 74 years old (M = 29.7, SD = 15.56). Participants were asked to indicate their sex/gender, resulting in a sample that consisted of 33 males, 51 females, 2 non-binary/third gender, and 2 who preferred not to respond that participated in this experiment. Demographics of the participants were 83% White, 3.4% Asian, 2.3% Black or African American, 2.3% Hispanic or Latino, 1.1% two or more races, and 6.8% preferred not to say. Participants were not compensated for partaking in this study.

Materials

An online Qualtrics survey was created and distributed in which participants were presented with digital faces that were masked and non-masked. Faces from the Chicago Face Database (CFD; Ma et al., 2015) were used as the basis for creating the masked and non-masked levels of the independent variable. The masked faces were created by using Google Drawings (Google, 2015) to add an opaque rectangle in front of the digital faces’ mouths. The digital faces varied evenly between race and gender, totaling 20 unique faces. A single question was asked per digital face, totaling 20 questions. Given the complex nature of trust, the questions were distributed equally in topic across the categories of perceived sociability, friendliness, general likeability, honesty, and trustworthiness to create an overall “trustworthiness score.” Some questions were direct such as, “How likely do you think it is that this person is social?” while others were more indirect, “Do you visualize this person leading a group conversation?” Participant responses were recorded using a 5-point Likert scale with anchors as “strongly disagree” and “strongly agree.” A maximum participant score of 100 would indicate that the participant felt extremely comfortable with the target faces while a minimum score of 20 would indicate complete distrust. A median score of 60 would indicate no differentiability in level of trustworthiness between the target faces. Sample masked and non-masked faces as well as all questions and choices are provided in Appendix A.

Procedure

Upon clicking the survey link, participants were prompted to read and agree to the informed consent (see Appendix B). Participants were informed that there was no time limit and that they could expect the survey to take between 20 and 25 minutes to complete. Participants were also told that they would be rating how they felt in response to questions presented about target faces that were shown on their screens. Only those that agreed to this could continue to the survey. Participants were then shown a survey that randomized digital masked and non-masked target faces, as well as the questions asked in each survey to counterbalance the results. For each face and question shown, participants rated their perceived feelings on trustworthiness that the digital target faces might have on a 5-point Likert-scale. Participants were asked to indicate their age, sex/gender, race, educational status, and political affiliation as the last task of the experiment. At the conclusion of the experiment, participants
were debriefed (see Appendix C). Information regarding the experiment’s purpose, what was truly being measured (perceived trustworthiness in response to face mask wearing), and how to contact the researchers for further information or with questions was stated.

**Results**

To properly assess the experimental conditions, questions referencing masked target faces were grouped together and questions referencing non-masked target faces were grouped. Within each group, the participants’ Likert-scale scores were averaged to obtain an overall “trustworthiness score.” A dependent samples t-test was used to determine the difference between the mean scores of each set. Analyses in IBM SPSS (Nie et al., 2021) found that between the masked target face scores (M = 50.67, SD = 11.05) and non-masked target face scores (M = 46.33, SD = 9.87) there was a significant difference t(88) = 6.12, p = .001; d = .65. Figure 1 indicates a significantly greater mean score of trustworthiness for masked target faces.

**Discussion**

A significant difference was found between participants rating of trustworthiness for masked target faces and non-masked target faces with masked target faces scoring higher. This finding did not support the initial hypothesis that masked target faces would rank lower on trustworthiness compared to non-masked target faces. This finding conflicts with research done by Malik et al. (2021) who found that masked target faces were perceived as less trustworthy. This may be because the study by Malik et al. (2020) included a video of masked and non-masked people offering advice, which adds the additional variable that participants level of agreement with the advice might impact their

![Figure 1. Mean Trustworthiness Scores for Masked Target Faces and Non-Masked Target Faces (Error Bars represent ± 2 standard errors)](image-url)
ratings of the person, independent of face mask usage. Conversely, the work done by Cartaud et al. (2020) coincides with the findings of this study, but perhaps because non-masked target faces expressed anger whereas expressions were neutral in our study. The significant findings of our experiment could be accounted for by the perceived disease protection that the participants felt from the masked target faces. Masks have been shown to reduce the transmission of Coronavirus and wearing one might also increase perceived trustworthiness or conscientiousness. The inconclusiveness between this experiment and past work highlights the limitations that must be considered.

The expression of the non-masked target face is an important element that may have influenced how participants ranked a target’s trustworthiness. In the masked target face scenario, participants were deprived of, and not influenced by, the mouth-expression of the target face. In the non-masked target face scenario, the mouth expression of the target face was visible and always neutral, possibly perceivable as disinterested or angry. Participants may have been more likely to trust the non-masked target face more if they had been smiling or showing another emotion.

Another limitation of this study may be how the masked target face condition was created. Instead of using pictures of people with true face masks, a simple opaque rectangle was imposed on faces from the Chicago Face Database (Ma et al., 2015). The simplicity of this opaque rectangle may not have been enough to create the desired effect of having target faces wearing an actual face mask. Participants may have not known that their perception of face masks was the variable being tested. The benefit could be that participant responses were not biased to be socially desirable regarding the ongoing pandemic situation and instead reflective of their true feelings on face masks. However, if participants did not perceive the masked condition to be a true face mask worn during the pandemic, then the results may have a weaker generalizability in real world situations.

The sample of this experiment presents another challenge. While there was a roughly equal spread of political affiliations and ages, the race of participants was 67.6% White. The target faces used in this experiment represented a mix of various races, but the large number of White participants may have caused bias in the results. Owens & Saw (2021) provide evidence that Black Americans have been shown to experience less anxiety and depression during the pandemic than White Americans. Obtaining a more racially equal sample may have caused face mask wearers to not be perceived as more trustworthy due to less anxiety over disease contraction from those without a face mask. Also, 58% of the participant sample identified as female. Females might be less likely to trust male target faces, regardless of if they are masked or not because of verbal and physical dangers. In the United States, it is estimated that 77% of women have experienced verbal sexual harassment and that 51% have experienced physical harassment with 85% of women indicating one to two males as the perpetrators in both types of incidents (Stop
Street Harassment, 2018). Ideally, there would have been an equal distribution of participant demographics in this experiment to avoid the biasing effects of majority groups.

Additional research is needed on how the relationship between trustworthiness and face mask wearing occurs in racially diverse populations. A meta-analysis of 26,000 papers published between 1974 and 2018 in top psychological cognitive, social, and developmental journals found that only 5% of them emphasized the effects of race (Roberts et al., 2020). One possibility to conduct a more racially focused face mask study would be to have White participants assess the trustworthiness of masked and non-masked target faces within and outside of their own racial group. The same measure would then be repeated with minority members as the participants. It would also be important to determine if children exhibit a trustworthiness and face mask wearing relationship. Since children are more actively developing their social skills than the adults in this experiment’s sample, perhaps a different relationship might exist. The concept of intersectionality and the diversity of experiences across race, culture, gender, and age is lacking in psychological literature.

Facial expressions are an impactful way that emotion is expressed (Hassin & Trope, 2020; Ledesma et al., 2020). To test the idea that a participant perceives a masked target face as more trustworthy because of the perceived decreased disease risk, an experiment should be conducted utilizing clear masks. This way, the lack of facial expressions (e.g., mouth expression) is erased and the effect of only the face mask itself on perceived trustworthiness is being tested. Assuming another situation in which traditional opaque masks are used, various mouth expressions of anger, happiness, and sadness in the non-masked target face condition could be tested. These results should be compared against the neutral mouth expression tested in this experiment for how they affect perceived trustworthiness. Other facial queues such as eyebrow movement typical of anger, happiness, and sadness could also be tested in masked and non-masked target face conditions.

The Coronavirus pandemic is a rapidly evolving situation where regulations and restrictions frequently change. Within the next few months or years, face masks might hold little significance. It would be interesting to see how perceived trustworthiness and general perception of masked and non-masked target faces evolves over time. Should the pandemic continue until then, face masks would hold their significance. This might result in a deepening of the preference for masked target faces if the significant difference effect was indeed caused by the perceived disease protection the participant felt.

As of February 17th, 2022, there are only three U.S. states requiring masks to be worn in all public spaces (Markowitz, 2022). While not required by law, wearing a face mask may still be a good idea for numerous reasons. The results of this study indicated that those who wore face masks were more likely to be ranked as trustworthy and sociable than non-masked counterparts,
likely due to the difference in perceived disease protection. This could have positive social outcomes for those who wear face masks in that others might be more likely to hold favorable opinions of them. Face mask usage also slows the transmission of diseases such as Coronavirus and Influenza, especially by those who are symptomatic (Leung et al., 2020). While the results of this study are encouraging, the possible limitations of how various facial expressions impact trustworthiness ratings, the generalizability of the mask condition to real-world situations, and participant majority group effects require more research to obtain a definitive conclusion about the perception of face mask users. Nonetheless, this research emphasizes a possible new way in which people understand and trust each other without informative facial cues; through the recognition of those who have a shared interest in maintaining health.
References


Appendix A

Sample masked and non-masked faces:

Questions participants were asked:

Please reference this image when answering the following question.

1. How likely do you think it is that this person is social?
2. How likely are you to let this person watch your things while you go to the bathroom?
3. How likely is it that this person would ask you what was wrong if you were sad?
4. How likely are you to share sensitive information with this person?
5. How likely are you to trust this person to pay you back if you had lent them money?
6. How likely are you to be friends with this person?
7. How likely is it that this person would admit that they were wrong?
8. How likely are you to buy a car from this person?
9. How likely is this person to approach you and start a conversation?
10. How likely is this person to ask you how your day is going?
11. How likely would this person contribute their fair share in a group project?
12. How likely are you to invite this person out to go for food?
13. How likely do you think it is that this person would cheat on a test?
14. How likely is it that you would trust this person in a leadership position?
15. How likely are you to visualize this person leading a group conversation?
16. How likely do you think it is that this person would hold the elevator for you?
17. How likely are you to reciprocate conversation if this person approached you?
18. How likely are you to feel safe were you to be alone with this person?
19. How likely is this person to lie to avoid doing a task?
20. How likely would it be that you would lend this person your phone to make a call?

Answer choices for each question above:

- Extremely unlikely (1)
- Somewhat unlikely (2)
- Neither likely nor unlikely (3)
- Somewhat likely (4)
- Extremely likely (5)

21. What is your gender identity?

- Male (1)
- Female (2)
- Non-binary / third gender (3)
- Prefer not to say (4)
- Other (5) ________________

22. What is your age?

Please slide to your age in years ()

[Sliding bar with pointer]
23. Please specify your ethnicity.

- White/Caucasian (1)
- Black/African American (2)
- Latino or Hispanic (3)
- Asian (4)
- Native American (5)
- Native Hawaiian or Pacific Islander (6)
- Two or more (7)
- Other/Unknown (8) ____________________________
- Prefer not to say (9)

24. What is the highest level of education that you have completed or are currently completing?

- Some High School (1)
- High School (2)
- Bachelor's Degree (3)
- Master's Degree (4)
- Ph.D. or higher (5)
- Trade School (6)
- Prefer not to say (7)
25. How would you describe your political affiliation?

- Leftist (1)
- Democrat (2)
- Moderate (3)
- Republican (4)
- Conservative (5)
- Other (please specify) (6) ________________________________
- Prefer not to say (7)
Appendix B

You are being asked to participate in a study as part of a class project in a research methods course in the Department of Psychology at the University of Minnesota. This study is being conducted to evaluate the effects of wearing face masks on interpersonal communication. If you choose to participate, no identifying information will be gathered from you, so it will be impossible to identify you as a participant. If you choose to participate, you may stop participating at any time. You may withdraw your data at any time, including after you have completed the study. If you have any questions or concerns before or after the study, please feel free to contact the researcher. The course instructor can also be contacted if you have additional questions. By clicking “Agree” below, you acknowledge that you have read this informed consent form and agree to participate in this study.

☐ Agree
Appendix C

This study examined the effect of facial coverings on perceived trustworthiness. All participants were shown a variety of digitally generated faces with some wearing a face covering and some not. Questions were asked about the participants’ feelings towards the digitally generated face along with perceived generalizations. The true purpose of the varied questions was to determine the perceived trustworthiness the participant felt in the digitally generated face/person. Diverse questions were needed to mitigate the effects of socially favorable responses. Previous research has focused on the effect of a mask on facial perception and emotional recognition. However, these studies have yielded an unclear answer as to whether wearing a face mask increases or decreases the perceived trustworthiness of that person. This study sought to come to a consensus on that difference and the reasoning behind it.

The only personal information recorded about you was your gender, age, race/ethnicity, education level, and political affiliation. If you want your data to be excluded from the study, we will do so. If you have any concerns about this research or have further questions, please feel free to contact the researcher. If you have any questions or concerns, you may also enter these in the space below.