



ORIGINAL ARTICLE

# *Psychological variables related to decision making for mask wearing during the COVID-19 pandemic*

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## BACKGROUND

Mask wearing can prevent and/or mitigate the spread of COVID-19. Psychological variables related to decision making can potentially influence mask wearing.

## PARTICIPANTS AND PROCEDURE

We surveyed college students ( $N = 1,085$ ) about wearing a mask inside a store and outside on a busy street. Predictor variables were demographics, COVID-19 variables, and psychological variables of health risk taking, recreational risk taking, consideration of immediate consequences, and consideration of future consequences.

## RESULTS

Health risk taking was negatively associated with mask wearing outside on a busy street but was not associated with mask wearing inside a store. Recreational risk taking was not associated with mask wearing either inside a store or outside on a busy street. Consideration of future conse-

quences was significantly positively associated with mask wearing both inside a store and outside on a busy street. Consideration of immediate consequences was not associated with mask wearing either inside a store or outside on a busy street.

## CONCLUSIONS

Marketing about store safety requirements of mask wearing may turn certain customers away from shopping inside the store. Their personality may not be of future consequences orientation and no matter how much one attempts to educate or reason with them, these customers will be opposed to mask wearing. Managers then need to decide whether to potentially lose a customer by requiring the customer to wear a mask to shop inside the store.

## KEY WORDS

COVID-19; consumer behavior; masks; risk-taking; consideration of future consequences

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## BACKGROUND

SARS-CoV-2 (the cause of COVID-19) has negatively impacted people worldwide with many cases and deaths (Centers for Disease Control and Prevention, 2021a). Vaccines can work to prevent COVID-19 infections, symptomatic illness, severe disease, and hospitalization (Dagan et al., 2021). Behavioral approaches to prevent and/or mitigate the spread of COVID-19 include mask wearing (Howard et al., 2021), physical distancing (Courtemanche et al., 2020), and hand washing (Centers for Disease Control and Prevention, 2021b).

Several variables have been studied for their association with mask wearing for COVID-19 prevention. Increased age (Bazaid et al., 2020; Haischer et al., 2020) and women are associated with mask wearing for COVID-19 prevention (Bazaid et al., 2020; Haischer et al., 2020). African Americans, Hispanics, and Asian Americans are more likely to wear masks for COVID-19 prevention as compared to Whites (Stosic et al., 2021; Hearne & Nino, 2022). Knowing someone with COVID-19 was positively associated with wearing a mask in public, previously having COVID-19 was negatively associated with wearing a mask in public, and knowing someone who died from COVID-19 was not associated with wearing a mask in public (Cherry et al., 2021).

There are often strong opinions about mask wearing for COVID-19 prevention, with some strongly advocating mask wearing while others are either mildly or strongly opposed. Psychological variables related to decision making would potentially be useful to study regarding mask wearing for COVID-19 prevention. There is limited literature on the psychological variables of risk taking and consideration of immediate/future consequences for mask wearing.

Risk taking can potentially influence engaging in COVID-19 preventive behaviors of mask wearing. Those with a greater proportion of engaging in COVID-19 social distancing risk-taking behaviors (composite score of number of face-to-face interactions with people outside the household without wearing masks and number of times engaged in certain group activities) were negatively associated with appropriate mask wearing (Byrne et al., 2021). Past increased risk-taking behavior (e.g., sunbathing without sunscreen) was associated with non-adherence to preventive measures that mitigated the spread of COVID-19 which included mask wearing (Pollak et al., 2022). More risk-averse individuals had greater levels of adherence to COVID-19 preventive behaviors than less risk-averse individuals for adherence to COVID-19 preventive behaviors that included mask wearing (Camargo et al., 2021; Miguel et al., 2021).

Engaging in risk-taking behaviors in the health (e.g., drinking heavily) and recreational (e.g., bungee jumping) domains as measured by the Domain-Specific

Risk Taking (DOSPERT) scale (Blais & Weber, 2006) has been studied for engaging in COVID-19 preventive behaviors. Increased health risk taking was negatively associated with engaging in COVID-19 preventive behaviors that included mask wearing (Keinan et al., 2021; Konc et al., 2022) while there were mixed findings for increased recreational risk taking with engaging in COVID-19 preventive behaviors that included mask wearing, with some reporting a negative association (Keinan et al., 2021) and some reporting no association (Konc et al., 2022). Lower health risk taking was positively associated with mask wearing outdoors (Steffen & Cheng, 2023; Xu & Cheng, 2021). Although early in the COVID-19 pandemic mask wearing was recommended in all situations, the current approach to mask wearing is that mask wearing for COVID-19 prevention is more important inside or in crowded outside environments but not as important when outside and not crowding near people (Centers for Disease Control and Prevention, 2021c). There does not appear to be any literature that specifically focuses on risk taking and the association of mask wearing outside on a busy street for prevention of COVID-19. Also, recreational risk taking could be useful for understanding mask wearing for COVID-19 prevention as people engage in recreational activities as part of daily activities without solely focusing on how recreational activities impact one's health. Recreational risk taking has only been studied for its association with engaging in multiple COVID-19 preventive behaviors that included mask wearing but not with mask wearing alone. It is likely that people with lower levels of health and recreational risk taking would be positively associated with mask wearing inside and also mask wearing outside on a busy street. We hypothesize:

H1a: Health risk taking is negatively associated with mask wearing inside a store.

H1b: Health risk taking is negatively associated with mask wearing outside on a busy street.

H2a: Recreational risk taking is negatively associated with mask wearing inside a store.

H2b: Recreational risk taking is negatively associated with mask wearing outside on a busy street.

The preference to receive a smaller reward now rather than an increased reward at a later time is known as temporal discounting (Loewenstein & Thaler, 1989). One study found that preferring delayed rewards rather than immediate rewards was positively associated with appropriate mask wearing to prevent COVID-19 (Byrne et al., 2021). However, another study found that preferring delayed rewards rather than immediate rewards was positively associated with greater risk taking for lower levels of engaging in COVID-19 preventive behavior that included mask wearing (Calluso et al., 2021).

The concept of consideration of future consequences can explain health prevention where those

concerned about future health consequences are more likely to engage in the short-term sacrifice of engaging in an activity to prevent a future negative health outcome than those concerned about immediate consequences (Joireman et al., 2012). One study found that those with a present time perspective were positively associated with engaging in passive COVID-19 risk behavior items that included mask wearing while those with a future time perspective were not associated with engaging in passive coronavirus risk behavior items that included mask wearing (Keinan et al., 2021). This study combined mask wearing for COVID-19 prevention along with many other risk behavior items and did not inform about the association of mask wearing alone for COVID-19 prevention (Keinan et al., 2021). Also, the studies using the temporal discounting paradigm did not differentiate between inside and outside mask wearing. Furthermore, although the theories of temporal discounting and the consideration of future consequences have the similarity of differentiating between immediate and future experiences, there is a difference between these theories. Temporal discounting is focused on attainment of a reward, whereas consideration of future consequences is also concerned with the aversion of negative consequences. COVID-19 has a future negative consequence of illness or possibly death. It is expected that those with a consideration of future consequences orientation would be positively associated with mask wearing inside as well as mask wearing outside on a busy street, whereas those with a consideration of immediate consequences orientation would be negatively associated with mask wearing inside as well as mask wearing outside on a busy street. We hypothesize:

H3a: Consideration of future consequences is positively associated with mask wearing inside a store.

H3b: Consideration of future consequences is positively associated with mask wearing outside on a busy street.

H4a: Consideration of immediate consequences is negatively associated with mask wearing inside a store.

H4b: Consideration of immediate consequences is negatively associated with mask wearing outside on a busy street.

## PARTICIPANTS AND PROCEDURE

### PARTICIPANTS

We approached 1,477 college students from a public New York City college from August through November 2020. There were 392 students who declined to complete the survey and all other 1,085 surveys had valid responses. The response rate was 73.5% [(1,085/1,477) \* 100%]. Surveys were presented as part of synchronous

online classes through either Blackboard Collaborate Ultra or Zoom. The survey was anonymous and disseminated with Google Forms. Participants' characteristics were age ( $M = 22.3$ ,  $SD = 4.92$  years), women (55.5%,  $n = 602$ ), and race/ethnicity: White – 18.2% ( $n = 197$ ), African American – 19.7% ( $n = 214$ ), Hispanic – 20.8% ( $n = 226$ ), Asian/Asian American – 26.2% ( $n = 284$ ), South Asian – 7.6% ( $n = 82$ ), other – 7.6% ( $n = 82$ ), and born in the United States (64.9%,  $n = 704$ ).

During this time, there was no formal lockdown in New York City where people were restricted from leaving their homes. However, depending upon the level of COVID-19 in a neighborhood, there were restrictions on opening of non-essential businesses, and public indoor gatherings had restrictions on the number of attendees (New York City, 2020). The project received ethical approval (no. 2020-0577) from the university Institutional Review Board. Participants provided written online informed consent.

### MEASURES

*COVID-19 questions.* COVID-19 questions were no/yes questions as follows: 1) Did you have COVID-19?; 2) Do you know anyone who had COVID-19?; and 3) Do you know anyone who died from COVID-19?

*DOSPERT subscales.* The DOSPERT (Blais & Weber, 2006) health and recreational subscales were used as these subscales are reported to be significantly associated with COVID-19 preventive behavior. These subscales are reliable and valid (Blais & Weber, 2006). There were six items for the health risk-taking scale. A Likert scale measured the items with a range from 1 (*extremely unlikely*) to 7 (*extremely likely*). The items were added for a total score where greater scores indicate greater health risk taking. A sample item is the chance of “drinking heavily at a social function.” Cronbach's  $\alpha$  reliability in our sample was .68.

There were six items for the recreational risk-taking scale. A Likert scale measured all the items with a range from 1 (*extremely unlikely*) to 7 (*extremely likely*). The six items were added for a total score where greater scores indicate greater recreational risk taking. A sample item is the chance of “bungee jumping off a tall bridge.” Cronbach's  $\alpha$  reliability in our sample was .81.

*Consideration of Future Consequences Scale.* The two subscales are reliable and valid (Joireman et al., 2012). There were seven items for the immediate consequences subscale. A Likert scale measured all the items with a range from 1 (*extremely uncharacteristic*) to 5 (*extremely characteristic*). The seven items were added for a total score where greater scores indicate greater immediate consequences. A sample item is “I only act to satisfy immediate concerns, figuring the future will take care of itself.” Cronbach's  $\alpha$  reliability in our sample was .75.

There were seven items for the future consequences subscale. A Likert scale measured all the items with a range from 1 (*extremely uncharacteristic*) to 5 (*extremely characteristic*). The seven items were added for a total score where greater scores indicate greater future consequences. A sample item is “I consider how things might be in the future and try to influence those things with my day to day behavior.” Cronbach’s  $\alpha$  reliability in our sample was .75.

*Outcome variables.* The outcome variables were “Do you typically wear a mask when shopping inside a store?” and “Do you typically wear a mask when walking outside on a busy street?”. Both were measured as no/yes.

## STATISTICAL ANALYSIS

Descriptive statistics consisted of mean and standard deviation for the continuous variables and percentage and frequency for the categorical variables. Multivariate logistic regression was used. Predictors included demographic variables, COVID-19 variables, risk taking variables, and both immediate and future consequences variables. IBM SPSS Statistics version 28 was used for the analyses. All  $p$ -values were two-tailed with  $\alpha$  at  $p < .05$ .

## RESULTS

There were 10.6% ( $n = 115$ ) that personally had COVID-19, 67.7% ( $n = 735$ ) that knew someone who had COVID-19, and 43.2% ( $n = 469$ ) that knew someone who had died from COVID-19. For risk taking, health ( $M = 15.90$ ,  $SD = 6.92$ ) had mean values between moderately unlikely and somewhat unlikely and recreational ( $M = 19.20$ ,  $SD = 8.44$ ) had mean values between somewhat unlikely and not sure. Consideration of immediate consequences ( $M = 20.00$ ,  $SD = 4.64$ ) had mean values between somewhat uncharacteristic and uncertain. Consideration of future consequences ( $M = 26.30$ ,  $SD = 4.16$ ) had mean values between uncertain and somewhat characteristic. For the outcome variables, typically wear a mask when shopping inside a store was endorsed by 98.6% ( $n = 1,070$ ) and typically wear a mask when walking outside on a busy street was endorsed by 89.3% ( $n = 969$ ).

Table 1 shows the multivariate logistic regression analyses. For mask wearing inside a store, the model explained 23% of the variance (Nagelkerke  $R^2$ ) and correctly classified 98.6%. For the COVID-19 variables, those who knew anyone who had had COVID-19 had significantly greater odds ( $p = .008$ ) for mask wearing inside a store. For the psychological variables, only consideration of future consequences had significantly greater odds ( $p = .011$ ) with mask wearing inside a store. Health risk taking, recre-

ational risk taking, and consideration of immediate consequences were each not significantly associated with mask wearing inside a store. For mask wearing outside on a busy street, the model explained 23% of the variance (Nagelkerke  $R^2$ ) and correctly classified 89.1%. Demographic variables with significantly greater odds for mask wearing outside on a busy street were women ( $p = .001$ ) and race/ethnicity of African American ( $p = .005$ ), Hispanic ( $p < .001$ ), Asian/Asian-American ( $p < .001$ ), and South Asian ( $p = .002$ ). For the psychological variables, health risk taking was significantly associated with decreased odds ( $p = .005$ ) and consideration of future consequences was significantly associated with increased odds ( $p = .006$ ) for mask wearing outside on a busy street. However, recreational risk taking and consideration of immediate consequences were each not significantly associated with mask wearing outside on a busy street.

## DISCUSSION

The study aims were to determine whether the psychological variables of health risk taking, recreational risk taking, consideration of immediate consequences, and consideration of future consequences were associated with mask wearing inside a store or outside on a busy street. Health risk taking was significantly negatively associated with mask wearing outside on a busy street. Recreational risk taking was not significantly associated with mask wearing inside a store or outside on a busy street. Consideration of future consequences was significantly positively associated with both mask wearing inside a store and outside on a busy street. Consideration of immediate consequences was not significantly associated with mask wearing inside a store or outside on a busy street.

We found that health risk taking was significantly negatively associated with mask wearing outside on a busy street but was not significantly associated with mask wearing inside a store. Previous literature reports a positive association between lower health risk taking and mask wearing outdoors (Steffen & Cheng, 2023; Xu & Cheng, 2021). Our findings for mask wearing outside on a busy street are similar to this pattern. We suggest that the lack of association for health risk taking and mask wearing inside a store is because people believe it is easy to contract COVID-19 indoors and therefore will wear a mask to prevent COVID-19 infection. However, as outdoor settings have less risk for contracting COVID-19 (Bulfone et al., 2021), those with greater levels of health risk taking may rationalize that although it is a busy street, since they are outdoors the risk for contracting COVID-19 is not high and therefore there is no need for mask wearing.

Contrary to our hypothesis, we did not find recreational risk taking significantly associated with mask

**Table 1***Multivariate logistic regression analysis for mask wearing*

Variables	Inside store OR (95% CI)	<i>p</i>	Outside on busy street OR (95% CI)	<i>p</i>
<b>Demographics</b>				
Age (years)	0.79 (< 0.001, 1,405.64)	.950	0.23 (0.02, 2.76)	.245
Gender (women)	1.41 (0.43, 4.60)	.570	2.11 (1.35, 3.31)	.001
<b>Race/ethnicity</b>				
White	1.00		1.00	
African American	1.02 (0.14, 7.15)	.987	2.25 (1.28, 3.96)	.005
Hispanic	1.09 (0.17, 7.19)	.926	3.92 (2.14, 7.17)	< .001
Asian/Asian American	2.15 (0.29, 15.71)	.451	23.30 (7.93, 68.43)	< .001
South Asian	0.35 (0.05, 2.24)	.264	5.68 (1.92, 16.84)	.002
Other	0.36 (0.06, 2.17)	.267	1.97 (0.96, 4.04)	.066
Born in United States (yes)	0.97 (0.28, 3.42)	.962	1.10 (0.68, 1.78)	.704
<b>COVID-19</b>				
Had COVID-19 (yes)	0.32 (0.07, 1.45)	.138	0.83 (0.44, 1.56)	.565
Know anyone who has had COVID-19 (yes)	6.22 (1.62, 23.84)	.008	1.42 (0.85, 2.39)	.182
Knew anyone who died from COVID-19 (yes)	0.83 (0.22, 3.08)	.779	1.03 (0.65, 1.63)	.915
<b>Psychological</b>				
Health risk taking	0.94 (0.86, 1.03)	.188	0.95 (0.92, 0.99)	.005
Recreational risk taking	0.95 (0.88, 1.02)	.156	0.99 (0.96, 1.01)	.342
Immediate consequences	1.07 (0.94, 1.23)	.303	1.04 (0.99, 1.09)	.125
Future consequences	1.16 (1.04, 1.31)	.011	1.07 (1.02, 1.12)	.006

Note. OR – odds ratio, CI – confidence interval.

wearing inside a store or outside on a busy street. Previous literature reports mixed findings where some report a negative association between increased recreational risk taking and engaging in COVID-19 preventive behaviors that include mask wearing (Keinan et al., 2021), whereas others report no association (Konc et al., 2022). Our findings specifically for mask wearing alone are like the finding of no association for mask wearing combined with other COVID-19 preventive behaviors. We suggest that not all recreational activities are health focused and people who engage in recreational activities with higher risk levels may not focus on health concerns related to COVID-19 when engaging in these recreational activities.

We found that consideration of future consequences was significantly positively associated with mask wearing inside a store as well as outside on a busy street. Contrary to our hypothesis, no association was found for consideration of immediate conse-

quences and mask wearing inside a store or outside on a busy street. Previous research with a temporal discounting paradigm obtained mixed findings. One study reported preferring delayed rewards rather than immediate rewards as positively associated with appropriate mask wearing to prevent COVID-19 (Byrne et al., 2021) while another study found the opposite pattern that preferring delayed rewards rather than immediate rewards was positively associated with greater risk taking for lower levels of engaging in behavior to prevent COVID-19 that included mask wearing (Calluso et al., 2021). Our findings for consideration of future and immediate consequences are like the first study and specify two different types of settings for this association for mask wearing rather than just general mask wearing. We suggest that those with a future consequences orientation recognize the possibility of contracting COVID-19 and wear masks to prevent the potential future negative

consequence from COVID-19 of illness or possibly death. The lack of an association for an immediate consequences orientation could be because there are two competing aspects of immediate consequences. There is the immediate consequence that one will not immediately become symptomatic with COVID-19 as there is an incubation period before one becomes symptomatic. However, there is also the immediate consequence that one can become infected by exposure to the virus since one was not wearing a mask.

This study has several limitations. First, this study only included college students and may not generalize to those of older ages. The reason is that those of younger ages may have higher risk-taking levels and less concern about the possible negative impact of COVID-19 infection. Second, social influence from peers can influence temporal discounting patterns where peers with impulsive tendencies can influence others to choose the smaller short-term reward rather than an increased reward at a later time (Gilman et al., 2014). It is possible that this can occur with consideration of future consequences. Future research should consider the role of social influence from peers and consideration of future consequences regarding mask wearing for COVID-19 prevention. Third, fear of contracting COVID-19 is positively associated with engaging in COVID-19 preventive behaviors (Harper et al., 2021; Oniszczenko & Turek, 2023). We did not measure fear level for contracting COVID-19. Future research should consider the role of fear level for contracting COVID-19 when studying consideration of future consequences and its association with mask wearing. Fourth, this study concerns psychological attitudes and self-reported behavioral tendencies and not objective recording of behavior.

Managers in retail stores find it challenging to require mask wearing for customers during the COVID-19 pandemic. Although many managers recognize the importance of mask wearing for preserving the health of their retail store employees and customers, not all customers agree to mask wearing even if it is the store policy. Marketing to customers about store safety requirements of mask wearing may turn them away from shopping inside the store. The reason is that the personality of these customers may not be of future consequences orientation and no matter how much one attempts to educate or reason with them, these customers will be opposed to mask wearing. Managers then need to decide whether to potentially lose a customer by requiring the customer to wear a mask to shop inside the store.

## CONCLUSIONS

In conclusion, health risk taking was significantly negatively associated with mask wearing outside on a busy street and consideration of future con-

sequences was significantly positively associated with both mask wearing inside a store and outside on a busy street. There are two theoretical implications. First, although recreational activities are often engaged in for health purposes, this study shows that health risk taking and recreational risk taking have different associations with mask wearing for COVID-19 prevention. Second, not all consequences are important for understanding mask wearing for COVID-19 prevention, as consideration of future consequences but not immediate consequences was associated with mask wearing for COVID-19 prevention.

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