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Determinants of safety-focused product purchasing in the United States at the beginning of the global COVID-19 pandemic

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ABSTRACT

Public preparation for the COVID-19 pandemic was widely covered in the media due to its intensity and fast-
pace. While some individuals prepared with personal safety supplies such as soap and hand sanitizer, many
others did not purchase such preparatory products. There are many health and safety benefits to quick en-
gagement and emergency preparedness in a pandemic, and it is important to identify those who conduct these
behaviors. The present study examined who engaged in preparatory purchasing of safety and health care pro-
ducts during the early stages of the spread of COVID-19 and what stimulated this action. Results of a cross-
sectional study (N = 344) indicates that possessing, or uncertainty about possessing a COVID-19 risk factor (but
not differences in age, gender, race, or income), increased purchasing of preparatory health and safety products.
Also, in line with past research on risk, affect, and behavior, worry mediated this relationship. Further, gender
moderated the relationship between worry and purchasing, such that worry increased product purchasing for
men, who were initially low in worry, but not for women. This study lends additional support to worry as a
mediator between risk and safety-related behavior and has implications for understanding factors related to
preparatory purchasing of health care products during pandemics.

1. Introduction

Great focus was placed on consumer purchasing behavior in the early stages of the COVID-19 global pandemic. In America, panic buying was heavily covered on the news and social media, with countless outlets reporting shortages in health and cleaning products, such as hand sanitizer and cleaning wipes (Telford and Bhattarai, 2020, Knoll, 2020). This type of buying, and the related product shortages, have the potential to impact individual health and well-being and the safety of others through product supply chains and overall burden on medical services. The behavior was largely deemed a result of over-reaction or greed on the part of consumers, or as a result of intent to resell on the part of some online sellers. Although such motives may have stimulated some consumer purchasing, not all rapid purchasing was likely of this variety. Instead, some individuals adopted a rapid response to the approaching pandemic to improve their health outcomes. This proactive coping can be viewed as a valuable health-pro-
tective behavior in the face of COVID-19. Currently, the factors predicting the purchasing of health care products at the early stages of a global pandemic are unknown. Further, it is unclear what psychological factors are key in motivating such purchasing. The aim of the current study was to obtain information on who engaged in this preparatory purchasing behavior as well as on a key psychological variable that may motivate this behavior.

2. Predicting preparatory purchasing

When considering what predicts protective preparatory purchasing, there are a wide array of variables that could be implicated. We began the study of this issue by testing variables known to influence susceptibility to and progress of COVID-19: age, income, race, gender, and possessing a health risk factor for COVID-19. Importantly, these predictors represent actionable points of intervention. It may be possible to change preparatory purchasing behaviors to be more equitable by addressing health disparities or by intervening to ensure risk perceptions are accurate.

2.1. Age

Age has been prominently discussed as a predictor of poor outcomes...
for COVID-19. Age is associated with a higher risk of both hospitalization (Garg et al., 2020) and death (Ruan et al., 2020) due to COVID-19. This information about age risks has spread widely. Also, previous studies have identified older age to be correlated with more preventative health behaviors (Deeks et al., 2009). This popular understanding of age in relation to COVID-19 risk, paired with existing evidence that older individuals engage in more preventative behaviors, suggests that age is a likely predictor or preparatory purchasing behavior.

2.2. Income

While income level may not directly influence susceptibility to COVID-19, those who earn less may struggle to adhere to recommended preventative behaviors, such as social distancing. Those in low-income areas are less likely to stay home following directives to do so (Chiou and Tucker, 2020), perhaps due to a lack of resources or requirements to physically attend work. Thus, it is possible that, due to increased exposure to others, individual in low-income areas are motivated to engage in more preparatory purchasing. Alternatively, it could be that low-income individuals purchase fewer products due to financial constraints. As such, divergent predictions could be made regarding the relationship between income and preparatory purchasing behavior.

2.3. Race

Black communities have been disproportionately impacted by COVID-19 in the United States. Infection rates are up to three times higher in predominately Black communities, and death rates are up to six times higher (Yancy, 2020; Garg et al., 2020). Other differences in race and ethnicity require further study; however, this initial evidence is reason to consider that race may influence preparatory behaviors, including purchasing health and safety products.

2.4. Gender

Gender represents another variable that may play a role in preparatory purchasing. There is emerging evidence that men are disproportionately impacted by COVID-19 (Garg et al., 2020), and daily postings of cases and demographic information mean that this information is widely accessible to the public. Further, gender differences exist in a variety of health behaviors, including both risky behaviors (e.g., alcohol consumption) and preventative behaviors (e.g., health screening; Dawson et al., 2007; LeMasters et al., 2014; Azevedo et al., 2007). Although these results vary based on behavior, women generally take part in more preventative behaviors than men. Further, gender differences are also seen in the utilization of health services (Bertakis et al., 2000), and in shopping and consumer behavior (Seoek and Bailey, 2007; Barber et al., 2009), suggesting that gender may play an important role in health-protective purchasing behavior related to COVID-19.

2.5. Medical risk factors for COVID-19

COVID-19 can infect anyone; however, the severity of the resulting illness is linked to certain medical conditions. It has been established that chronic illnesses, including cardiac illnesses, chronic respiratory illnesses, diabetes, and HIV, place individuals at high risk for complications resulting from COVID-19. Although some risk factors are clear, others remain unclear. For example, it is not yet known how chronic illnesses, such as hypertension (Schiffrin et al., 2020), affect those with the novel coronavirus. Given the variations and uncertainty of objective risk, perceptions of COVID-19 risk factors are likely to influence health behaviors like preparatory purchasing. The influence of risk perceptions is a well-established predictor of many protective health behaviors (Ferrer and Klein, 2015). Thus, it can be anticipated that perceptions of possessing a risk for COVID-19 will predict safety-focused acts, such as preparatory product purchasing.

3. Affect as a mechanism for preparatory purchasing

If predictors of preparatory purchasing are identified, the question turns to why these variables have such effects. In the present study, we assess the possibility that affect, particularly the emotion of worry, serves as a critical psychological mechanism linking predictors to purchasing behavior. Prior research indicates that affect often relates to both objective risk and perceptions of risk (e.g., Lipkus et al., 2005), and affect has been identified as a salient and proximal cue that stimulates health-protective action (Williams et al., 2018). For example, a meta-analysis by McCaul et al. (1996) found both risk for breast cancer and worry about cancer were related to higher levels of preventative breast cancer screening. The current climate around COVID-19 has provoked feelings of worry in many individuals. Worry over COVID-19 likely varies between individuals, and it may be surmised that worry is elevated by the aforementioned predictor variables linked to COVID-19. In the present study, it is hypothesized that the state of worry mediates the relationship between risk for COVID-19 and preparatory purchasing. This possibility is consistent with other research in which affect served as a mediator between perceived risk and health behaviors (Chapman and Coups, 2006; Zhao and Nan, 2016; Kiviniemi and Ellis, 2014).

4. Preparatory purchases

To assess preparatory purchasing, a larger range of health-related products were assessed. Some products, such as hand soap, are considered health-protective and were assessed. Amidst the rapid pace and confusion of the COVID-19 pandemic, information about what products provide a health benefit has been contradictory and inconsistent. Some unproven products have been recommended in social media and from official sources, including leaders of the American government. Assessing a wide array of preparatory purchases presents an opportunity to capture individuals’ attempts to engage in self-protective behaviors broadly.

5. Method and materials

5.1. Participants

Participants were contacted using the online participant recruitment system Prolific and were provided with monetary compensation for their participation in the study. Of the 344 participants, 54.1% identified as women, 43.9% identified as men, and 1.5% identified as another gender or preferred not to disclose their gender. Participants ranged in age from 18 to 74 (M = 32.69, SD = 11.60). Participants represented 44 of the United States and were 68% White, 16% Asian/Asian-American, 5% Black, 5% Latinx, and 6% two or more races.

6. Materials

6.1. Demographics

A demographic questionnaire assessed participant age, race/ethnicity (coded as white non-Latinx vs. non-white or Latinx), gender, and income (coded as above or below $75,000). For purposes of data analyses, the gender variable was recoded to only include those who identified as men or women, as there were not enough “other” responses in order to be included in the analysis (n = 4).

6.2. Perception of COVID-19 risk factors

In order to simply capture risk related to COVID-19 during a time
when new information was regularly being introduced about risk factors and affected groups, a single-item measure was used, reading “Do you have any condition that makes you more vulnerable to the coronavirus?” Response options included, yes, no, and unsure. Preliminary analyses indicated that individuals selecting “yes” and “unsure” responded the same on product purchasing and worry. As such, two groups were created, individuals indicating they did not have a risk factor (n = 241) an those who did or were uncertain (n = 101).

6.3. Worry

As a global pandemic on the scale of COVID-19 is unprecedented in modern times, measures to assess worry that capture the full extent of the situation around the coronavirus had not been created. In order to simply assess worry surrounding the situation, a single-item, 7-point, Likert-style measure was created, modeled after the Worry Domains Questionnaire (Tallis et al., 1992). This single item reads, “How worried are you about the coronavirus?” with response options ranging from 1 (Not worried at all) to 7 (Extremely worried).

6.4. Preparatory purchases

A comprehensive list of 24 types of health and cleaning products was provided to participants under two prompts. In order to include the broadest cut of the population, both conventional and alternative health and cleaning products were included. Items were chosen for inclusion based on current recommendations from the United States Centers for Disease Control and Prevention and on relatedness to COVID-19 symptoms. Participants were first provided with the prompt, “Which products did you purchase or attempt to purchase in the past 2–3 weeks specifically in preparation for COVID-19, the novel coronavirus?” before being shown items specifically for health and cleaning products. These items asked, “In preparation for the coronavirus, which of the following health products/cleaning products did you purchase or attempt to purchase? (Please select all that apply).” The ten health products included items such as bleach, Clorox/Lysol (name-brand commercial cleaning) wipes, hand sanitizer (at least 60% alcohol), natural hand sanitizer (non-alcohol primary ingredient), hand soap, vinegar, and a write-in option. The 14 health products included items such as cold or flu medicine, an extra supply of prescription medication, acetaminophen or ibuprofen, essential oils, herbal supplements, and write-in options for other medication, supplements, or vitamins. The total number of preparatory purchases were summed to form the dependent measure (M = 4.30; SD = 3.17).

6.5. Procedure

This study was part of a larger project on COVID-19 that was approved by the University of Toledo Institutional Review Board. All procedures were conducted in compliance with the guidelines of the American Psychological Association. Inclusion criteria included being 18 years old or older and currently residing in the United States. For other purposes, participants first were shown one of five brief handwashing messages. Importantly, the variables of interest to the current study, risk factor perceptions, worry, and product purchases, did not differ by the message shown. Thus, this handwashing message variable is not discussed further. Participants then completed the previously described measures of preparatory purchases, worry, and risk for COVID-19.

7. Results

First, an analysis was conducted to determine which variables predicted preparatory purchasing. A between-subjects ANOVA including (1) perceived COVID-19 risk factor, and the demographic variables of (2) gender, (3) age (as a covariate), and (4) income as predictor variables revealed that only having or being uncertain about having a COVID-19 risk factor predicted preparatory purchasing. F(16, 320) = 4.77, p = .03. Specifically, those reporting having, or being uncertain about having, a risk factor purchased more preparatory products (M = 5.24) as compared to those without a risk factor (M = 4.20).

Next, the relationships between the predictor variables and worry about COVID-19 were assessed. A between-subjects ANOVA with the predictors violated the assumption of homogeneity of variance. As such, separate Welch’s ANOVAs, which does not require the assumption of homogeneity of variance, were used. Results indicated that only two variables predicted worry. First, individuals reporting having, or being uncertain about having, a COVID-19 risk factor experienced greater worry, F(1, 271.53) = 40.70, p < .001. Second, women also reported greater worry than men, F(1, 305.97) = 10.94, p < .001. Finally, a correlational analysis also indicated that worry about COVID-19 was significantly related to increased preparatory purchases, r = 0.18, p < .001.

Because of the relationships between risk factor, worry, purchasing behavior, and gender, a moderated-mediation analysis was conducted using PROCESS for SPSS (Hayes, 2017). Specifically, the model tested if (1) the relationship between perception of a COVID-19 risk factor and preparatory purchasing behavior was statistically mediated by worry, and (2) if the link from worry to preparatory purchasing was moderated by gender. Worry completely mediated the relationship between having a risk factor and preparatory purchasing. Critically, this mediation effect was moderated by gender, such that it occurred for men (95% CI [0.42, 1.39]) but not women (95% CI [−0.49, 0.51]). This model resulted in a significant index of moderated-mediation, 95% CI [−1.12, −0.06] (see Fig. 1).

8. Discussion

Product shortages and difficulties in obtaining health and cleaning supplies present difficulties for individuals and organizations in ensuring the health and safety of those they are responsible for during the spread of a highly contagious disease. Preparatory purchasing in response to COVID-19 in the United States has been primarily presented as a result of panic or selfishness on the part of the consumer. While there are certainly some newsworthy cases that align with such explanations, the present results suggest a more complex explanation for the widespread purchasing of preparatory products, in that at least some of this product purchasing was by individuals who were most at risk from COVID-19, and that this action was driven by worry.

![Fig. 1. The moderated-mediation model.](image-url)
8.1. Affect, risk, and health behaviors

Those individuals who perceived themselves to be more at risk, or were uncertain about their risk, for COVID-19 were more likely to engage in self-protective preparatory purchasing than those who did not view themselves as being at risk. This relationship was statistically mediated through COVID-19-related worry. These findings lend support to previous studies, which have shown a mediational relationship between risk factors and affect in health decision making (e.g., Kiviniemi and Ellis, 2014). This study also extends these findings by demonstrating that this relationship occurs in the context of an unprecedented global pandemic, when emotions and salience of health decisions are high and individual risk is ambiguous.

In a time of rapidly evolving information, it is difficult to always fully capture and portray the factors that put individuals most at risk. Clearly communicating these factors are essential in order to prevent under- or overestimation of risk. In terms of preparatory purchasing behavior, accurate risk communication may help prevent those who underestimate their risk from being unable to purchase needed supplies at a later date. Encouraging accurate perceptions of risk may help to ensure access to needed supplies for all people, which may, in turn, help to reduce the spread of disease and reduce the burden on the healthcare system.

8.2. Gender

Gender was found to significantly moderate the relationship between worry and preparatory purchasing. Specifically, possessing a risk factor for COVID-19 was related to increased worry, which in turn, was linked to more preparatory purchasing, but this only occurred in men. Women were less influenced by having a COVID-19 risk factor, which may be due to their overall higher level of worry about COVID-19. These results have implications for future health behavior research as they suggest that worry may be an effective motivator for individuals with low levels of worry, such as men with many health-protective behaviors.

8.3. Limitations

These findings should be understood in light of the limitations of the present study. Self-report measures were used to assess preparatory purchasing behavior. While the items asked participants to report on items they purchased or intended to purchase, it is possible that the unique situation of resource shortages may add to the difficulty in respondents accurately reporting their purchases or attempted purchases. Further, while care was taken to ensure the chosen products were related to COVID-19 or its symptoms, the lists of potential health and cleaning products were not exhaustive. Perceived risk and worry were also assessed after products had already been purchased.

9. Conclusions

In light of the current public health crisis, it is more important than ever before that governments and health organizations are prepared for pandemics. Encouraging the public to engage in appropriate, but not excessive, preparatory purchasing of protective goods is critical to ensuring the public health and safety. The present findings have important implications for understanding how individuals engage in self-protective behavior when confronted with a public health emergency. The results suggest that possessing a risk factor leads to greater preparation, and this occurs because of greater levels of worry. This relationship, however, relates to more preparatory purchasing primarily for individuals who are at greater risk but are not yet worried (in this case, men with a risk factor). Other variables, such as income and race, did not relate to preparatory purchasing. Finally, consistent with recent research comparing affective and cognitive pathways for health behavior, the mediation results suggest that the link between risk factor status and preparatory purchasing was due to feelings of worry.

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