

Analyzing the Hoarding Behavior of Disinfection Products During COVID-19

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ABSTRACT

Hoarding and panic buying are common reactions of people towards unexpected disasters throughout history. This paper will specifically focus on COVID-19 and hoarding behaviors on masks, hand sanitizers, and other disinfection products that are essential during the pandemic. By researching historical examples of hoarding and sending out a questionnaire to find out current opinions on hoarding, this paper wants to investigate consumers' motives and psychology behind these behaviors, and to further explore the impacts of this certain behavior and possible strategies firms can use in the future to deal with a similar situation. Over 100 questionnaires are collected and investigated, mostly from teenagers and young adults. As a result, we find that most consumers who commit hoarding behavior during a pandemic are more likely to already have a habit of stockpiling, and believe that hoarding can provide them with security and sanctuary. Even people who have not previously developed the habit of stockpiling necessities have considered hoarding disposable masks and other disinfection products during the pandemic due to the lack of security and convenience.

Keywords: Consumer hoarding behavior, Panic buying, COVID-19, Quarantine

1. INTRODUCTION

It has been almost two years since COVID-19's outbreak. Most people now recognize the significance of masks and other disinfection-related products such as hand sanitizers. People are also more used to wearing masks in public places compared to the beginning of COVID-19. Today, firms can maintain daily supply and demand without huge difficulties. However, the case was different at the beginning of the pandemic, when the sudden outbreak of COVID-19 evoked high anxiety levels among people and led to rocketing demand for masks and other disinfection-related products. While panic buying is a common topic throughout history and there is already information examining this kind of phenomenon, this paper wants to focus specifically on the context of COVID-19 and investigate the cause and effects of hoarding behaviors. The theoretic part of this paper is finished by examining and evaluating former researches. The main focus of the paper is achieved by sending out online surveys on platforms such as Douban and in high schools to avoid biases. The survey contains questions relating to COVID-19 and hoarding behaviors and mainly targets teenagers and young adults. By analyzing survey results, it may help investigate the

public's, especially teenagers and young adults' motives behind hoarding behavior and panic buying and provide suggestions for reducing such phenomenon and for firms to design strategies to be more prepared for similar situations in the future.

2. MOTIVES AND PSYCHOLOGY BEHIND HOARDING BEHAVIORS

Hoarding and panic buying both refer to purchasing large quantities in a short amount of time either wishing to benefit from future price raising or afraid that it will be more difficult and expensive to purchase in the future [1]. The common causes of hoarding behaviors include concerns about the unknown, fear of shortages of goods, and fear of missing out (FOMO) when everyone around you is rushing to hoard. Economists and psychologists also consider consumers who committed hoarding behaviors are influenced by social and psychological factors: such as the press, social media, celebrities, and peers [2]. Environmental stressors were found to trigger autonomic arousal, which includes increased heart rate, adrenaline release, raised blood pressure, and also anxiety, fear, anger, and other emotional reactions [3]. For example, hoarders in the United States chose to purchase a huge amount of toilet paper at the start of the

Coronavirus. When consumers found out that toilet paper was soon out of stock, this aroused panic and continued to lead consumers to rush to supermarkets and buy as much toilet paper as they could and soon limited the number of toilet paper an individual can purchase. Similar situations also occurred with hand sanitizers and masks, for example, Malaysia had reported an 800% increase in sales of hand sanitizers [4].

In addition, psychologists also proposed that hoarding behaviors are the results of human beings' herd instinct and zero-risk bias. Herd instinct is a phenomenon that takes place when people follow others' actions, believing others have already done the research and their ideas would make sense rather than doing their analysis [4]. As an individual decides to stock up on a certain product, toilet paper, for instance, other consumers might find it reasonable and would repeat the action, these actions would eventually grow into a speculation cycle and even prompt more consumers to start hoarding toilet paper and worse panic among people. On the other hand, zero-risk bias relates to human beings' preference for absolute certainty and contributes to hoarding behaviors as consumers believe that hoarding disinfection-related products can help eliminate their chance of getting the Coronavirus [5]. Consumers were scared of the uncertainty of the pandemic and what they can do is to stock up products to release their stress, help them feel more secure, and help make the whole situation seem more controllable, which in the end would become panic buying and hoarding behaviors.

Events of panic buying and consumers hoarding a certain commodity are not unusual throughout history. Similar situations happened during and after WWII, during the Cuban Missile Crisis when people stockpiled canned goods and bottled water, after the Great Depression when people tried to stockpile currency, and also Y2K at the turn of the millennium [6]. However, panic buying and hoarding are different from disaster preparation. Natural disasters such as a flood or a hurricane can be predicted and detected using modern technology, but the pandemic is much more challenging to predict and to prepare for the different variant strains in advance. Therefore, hoarding during the pandemic is usually unnecessary and might even cause more negative impacts, including waste and misdistribution of resources.

Although the U.S. government did encourage people to shop for enough daily necessities such as food and water due to lack of access to goods during quarantine, hoarding items besides daily necessities in most cases is unnecessary and may provoke panic in the public. For example, in China, plenty of people believed in a rumor that claims ShuangHuangLian oral liquid can prevent coronavirus and stockpiled this product both on offline pharmacies and online e-commerce platforms [7]. Nonetheless, there were not any medical professionals who had proven that ShuangHuangLian can help prevent

the coronavirus. In addition, by hoarding a large number of goods, it can be kept away from those in need. To take masks and hand sanitizers, for example, most people do not require that many disinfection-related products when they are quarantined at home, but still purchase them to feel more secure and safe. On the other hand, health workers and patients might lack the resources that are hoarded by people. The poor who have no access to these goods may also be harmed by hoarding behaviors and panic buying.

The driving force behind hoarding behaviors is primarily anxiety and fear of the unknown during the pandemic and hoarding behavior, in general, can be an overall response that "involves a mix of a strategic, rational and emotional human response to perceived threats to supply" [3]. Under a circumstance like COVID-19, consumers were prone to be affected by the environment and all the information around them. Students may be worrying about whether the pandemic will affect their graduation and job opportunities. Adults may be worrying if the pandemic will lead to the downsizing of the companies. People may also be worrying for their families and at the same time being more vulnerable to news related to confirmed coronavirus cases [6]. To deal with these negative emotions, authorities suggested we communicate more with family and friends, express ideas and feelings that make one anxious, stay off unauthorized media, believe in professionals, and reduce screen time.

3. HOARDING BEHAVIORS' EFFECTS ON THE MARKET

Hoarding can be considered as an example of the public goods game. The public goods game is set under a circumstance when an individual would be more beneficial if they do not contribute, while all individuals would gain greater benefits if more individuals contribute [8]. In this context of hoarding, everyone would be better off if none chooses to hoard instead of purchasing the actual amount one needs, but one would gain much more benefit by purchasing far exceeding one's need. Consumers may not expect anything to happen because of a simple act of them, but hoarding behaviors and panic buying would disrupt the supply chain of a product and force firms to increase production in a short amount of time. Nevertheless, the newly produced goods require time to be transported to different regions within China and would result in a temporary shortage of certain goods. Shortages within the market and the growing anxiety level among the public would result in an even worse situation with consumers competing for goods and raising the prices of goods. As a result of these factors, starting hoarding behaviors in the first place might eventually damage the market and all the consumers and firms within it.

Since hoarding behaviors can be harmful to the market and create instability and inefficiency in the supply chains, economists have been working to alleviate this issue and provide better coping methods. For example, Sterman and Dogan had researched this topic by utilizing the Beer Distribution Game. They hypothesized the signals of scarcity triggered hoarding among many of the outlier participants and allowed people to increase their desired inventory coverage (hoard) [3]. They proposed that every individual is susceptible to hoarding and phantom ordering to some degree and encouraged companies to “design information systems and other features of the workplace to minimize the stresses that might trigger dysfunctional behavioral responses to scarcity” to deal with the emotional factors

of hoarding [3]. Furthermore, more research and studying can take place for behaviors and spending habits of consumers relating to manufacturing and service operation. In this way, firms could be capable of building automated supply chain management systems that can cope more efficiently with complex situations.

4. DATA ANALYSIS

In order to find out people’s thoughts and motivations behind hoarding behaviors, we sent out online surveys and mainly questioned teenagers and young adults about their opinions on hoarding behaviors during the pandemic. The survey includes the following questions:

Table 1. Responses on Behaviors Relating to Hoarding and COVID-19

1. Which age group do you find yourself belonging to?	Below 19: 44
	20-29: 59
	30-39: 1
2. Do you have a habit of stockpiling?	Yes: 56
	No: 48
3. Do you prefer to stockpile a large number of products during e-commerce platforms’ big sales?	Yes: 66
	No: 38
5. Have you felt scared of facing shortages of masks and other disinfection products during the pandemic?	Yes: 69
	No: 35
6. Would you prefer to hoard a great number of masks when they are available?	Yes: 66
	No: 38
7. Do you agree with the following statement: hoarding helps me feel secure.	Yes: 77
	No: 27
8. Do you agree with the following statement: hoarding masks prevent me from getting coronavirus.	Yes: 38
	No: 66
9. Which one or more of the following situations do you find yourself belonging to? a) I am anxious about the pandemic and hoarding may help me to handle the future better. b) Everyone around me is hoarding and I do not want to feel left out. c) The news about the coronavirus is scary and I think I should hoard to be more prepared. d) Masks and other disinfection products are often out of stock so it is necessary to hoard	A: 67
	B: 22
	C: 43
	D: 70

We end up collecting 104 responses for the survey, with a majority of 99% of the participants aged from under 19 to 29, making the results able to represent teenagers' and young adults’ opinions on hoarding.

Out of the 104 responses, 53.8% of the participants admitted that they have a habit of hoarding prior to the outbreak of pandemic and 51.9% of participants prefer shopping and stockpiling during sales and shopping festivals. Of the 56 participants who already developed the habit of stockpiling, 76.79% of them would choose to hoard a great number of masks when they are available, compared to only 47.92% of the participants who do not hoard would choose to do the same thing. In addition, people who prefer to hoard are more likely to find

hoarding provides them with a sense of security and prevent them from getting coronavirus. On the contrary, people who do not find it necessary to hoard or take part in holiday shopping daily also show less interest in hoarding masks during the pandemic. Compared to 91.07% of participants who hoard believe hoarding provides security, only about 54.17% of participants who do not hoard agree that hoarding may provide people with a sense of security and also indicates more disagreement with the statement of hoarding masks prevent me from getting coronavirus.

The responses of the survey also help illustrate possible motivations for consumers’ hoarding behavior. While about 9.62% of the participants comment that they

would not choose to hoard daily, the rest of the participants believe the two major reasons for hoarding are anxiety toward the pandemic and the high demand for disinfection products in a special condition like the pandemic, each occupying more than 60% of participants' choices. Participants are also less likely to believe that herd mentality and the fear of being left out are the main driving force for their hoarding behaviors.

5. CONCLUSION

In summary, the major driving force for hoarding and panic buying of teenagers and young adults during the pandemic are their anxiety and fear towards the uncertainty of COVID-19, believing that hoarding can help them become more secure and controllable of the situations. The abundant information on the Internet and social media also contribute to reinforcing a sense of insecurity in making people scared of being left out from their peers and people around them. Consumers who already develop a habit of hoarding daily are also found to be more likely to hoard masks during the pandemic. Hoarding and panic buying surely is irrational behavior, but they are not rare throughout history and maybe reasonable in dealing with sudden, unexpected disasters. Nevertheless, authorities have suggested that current hoarding behavior during the pandemic is unnecessary. What will happen next for the pandemic is unknown to us, so recklessly hoarding certain products may be too radical and also not helpful to react to future problems. Moreover, hoarding and panic buying may also damage the market by disturbing supply chains and assert pressure on the firms, which would result in an increase in prices and a higher anxiety level. The supply chains for daily necessities such as foods and masks have fluctuated during the past year and are stabilized enough to maintain normal daily supply and demand in the market. This allows consumers to purchase the products they need as soon as possible without the need to wait for restocking. Although COVID-19 may seem to be well controlled in China, we have no idea of what we will face in the future. The whole COVID situation might worsen and more variants of the coronavirus might be found. Similar or different global crises might also take place and would continue to lead to hoarding and panic behavior, dreadfully impacting markets and supply chains. Therefore, it is recommended but also necessary to have more researches considering to find approaches to help resist consumers' hoarding behaviors, such as designing information systems and other features to avoid triggers for hoarding and help minimize people's stresses. Firms may also consider stabilizing supply chains in order to become more prepared for similar circumstances in the future.

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