

Panic Buying and Its Causes: A Case Study of the US Toilet Paper Market

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ABSTRACT

Panic buying refers to a sudden increase in the consumption of certain goods due to perception or expectation of adverse situations. The goal of this paper is to explore the psychological factors that drive panic buying during a pandemic, more specifically, the global-wise COVID-19 outbreak. Literature review showed that perceived risk, lack of social capital, and anxiety coping can be the potential causes of panic buying during a pandemic. A case study of the US toilet paper market during COVID-19 was conducted. Throughout March 2020 and following months, sales of toilet paper increased significantly compared to pre-COVID times, implying the US population panic buying toilet paper at the time. Data from previous research projects and nation-wide surveys were analyzed, and it showed that the afore-mentioned three psychological factors were also present, on one degree or another, at the time in the US: People on average experienced a medium level of perceived risk from the disease; The level of social trust remained medium and the level of social support from neighbors decreased after the outbreak, both of which are components of social capital; And people in general experienced high levels of anxiety during the pandemic. Understanding the underlying drivers of panic buying can provide insights into alleviating such irrational buying behavior in the future.

Keywords: Panic Buying, COVID-19, Toilet Paper

1. INTRODUCTION

Panic buying is defined as a sudden increase in the consumption of certain goods due to perception or expectation of adverse situations [1]. It was a common phenomenon during the COVID-19 pandemic [2]. Panic buying, as shown in its name, is accompanied with negative feelings such as anxiety or fear, but the question remains what really drives panic buying. Answering this question can provide insights into alleviating such irrational buying behavior in the future.

The research question here is what psychological factors can predict panic buying. The first part of this paper discusses several causes of panic buying by referring to current literatures on this topic. Afterwards, the focus would be shifted to the US toilet paper market during COVID-19 as a case study. The second part of the paper would discuss the market's panic buying phenomenon and analyze whether the causes of panic buying accompanied the phenomenon at the time in the US.

2. CAUSES OF PANIC BUYING DURING A PANDEMIC

Many psychological factors have been proposed to trigger panic buying [3]. This paper would focus on only three of them, exploring how these factors work to drive panic buying during a pandemic. The causes focused here are 1) perceived risk, 2) lack of social connectedness, and 3) anxiety coping.

2.1 Perceived Risk

Perceived risk can be determined by one's perceived susceptibility to an adverse situation. In the case of a pandemic, the level of perceived risk can be measure by the probability of contracting a certain disease [4].

Bish and Michie proposed that, when perceiving risks from a health crisis, people engage in two types of behaviors [5]. One is preventive behaviors that aim to maintain hygiene, such as washing hands or wearing a mask. The other is avoidant behaviors that aim to minimize the risk of capturing a disease, such as

avoiding crowds or lowering physical contacts with others. Both types of behaviors might lead to panic buying. Higher frequency of preventive behaviors requires more hygiene products than usual, driving people to purchase more hygiene products than usual. Avoidant behaviors imply a lower frequency of going out, thus people buy more each time they do grocery shopping.

Interview responses from UK consumers during the COVID-19 pandemic further supports the effect of avoidant behaviors on panic buying [6]. Several interviewees mentioned that they would buy large quantities of grocery items each time they went out so as to stay at home as much as possible, saying it was not worth it to catch the disease simply because of daily shopping. In other words, panic buying can be driven by fear of illness.

In sum, according to Bish and Michie's theory on health-related protective behaviors and interviews of UK consumers in another study, people tend to engage in panic buying when they perceive high risks during a pandemic [5,6]. This is because buying large amounts of necessities with low frequency can lead to fewer contacts with others and thus minimize one's risk of contracting the disease.

2.2 Lack of Social Capital

Social capital is defined as "a measure of trust, belonging and participation in one's community" [7]. It consists of two aspects: social trust and social support. High levels of social capital can help alleviate the negative social impacts brought by a pandemic, such as feelings of stress or anxiety [7]. As a result, people with a higher level of social capital are expected to engage less in panic buying since they don't need to rely on purchasing products to cope with those negative feelings.

In time of crisis, social trust is strengthened when people interact with each other [8]. During a pandemic when people adhere to social distancing, there could be a lack of social trust in the communities. For instance, people would not trust others to buy just the amount they need during a pandemic and they would be fearful of not getting their own shares, thus people tend to buy more when products are still available, which eventually leads to panic buying [9].

Another element of social capital is social support, defined as assistance provided by others to deal with stressors in life [10]. One model of panic buying, created by Rajkumar, hypothesized an inverse relationship between social support and panic buying [11]. The rationale is that a lack of social support has been found to associate with hoarding and related behaviors, which is a behavior similar to panic buying

since both are characterized by a desire to possess large amounts of certain items [12].

Previous research suggested lacking either social trust or social support can lead to panic buying.

2.3 Anxiety Coping

When people feel anxious during a pandemic, the act of panic buying helps alleviate that anxiety [3]. Meanwhile, low levels of anxiety can help prevent people from irrational buying behaviors such as stockpiling [13].

There are two aspects of how panic buying helps people cope with anxiety. First, the act of purchasing itself brings a sense of relief among all the anxiety during a pandemic [14]. In other words, panic buying is not driven by the needs for the products but the feelings that come with buying those products. Second, purchasing necessities help people to regain a sense of control in face of all the uncertainties during a pandemic [15].

To sum up, previous research proposed that perceived risk, lack of social capital, and anxiety coping are among the causes of panic buying. However, many of the afore-mentioned literatures were qualitative or theoretical only. A case study with quantitative data analysis would offer further insights into the causes of panic buying.

3. CASE STUDY: THE US TOILET PAPER MARKET DURING COVID-19

The case study would focus on when the health crisis first began in the US, which was around March 13, 2020, the day the country declared COVID-19 a National Emergency [16]. Data analyzed in this case study are from either March or April in 2020.

3.1 The Toilet Paper Market and Buying Behaviors

To start with, the panic buying of toilet paper was studied both on a macro or social level and a micro or individual level.

3.1.1 The Social Level

On the social level, sales of toilet paper have significantly increased compared to pre-COVID times. National retail sales of toilet paper increased 845% in the week from March 16 to March 22 compared to the prior month [17]. On March 11 and 12, toilet paper was ranked as the highest-selling category by total daily dollars in the US. Before March 2020, toilet paper had never ranked above 16 [18]. From March 11 to March 21, daily spending on toilet paper increased 194% compared to the same time frame back in 2019 [19].

Other than increased sales, panic buying of toilet paper was manifested through its severe out-of-stock problems. From mid-March to the end of April 2020, more than 50% of the US grocery shops were out of stock for toilet paper, whereas none had such problem before March. The figure peaked on March 23, a day where 72% of the US grocery stores failed to offer any toilet papers during most of the day [20]. In addition, the problem cannot be attributed to a disrupted supply chain because the supply chain remained strong even during the pandemic [21].

3.1.2. The Individual Level

To analyze individual buying behaviors of toilet paper during the pandemic, data from a previous research project, conducted by Garbe and her colleagues, were analyzed [22]. The online survey was conducted from March 23 to 29, 2020, and the data is openly accessible through Open Science Framework. The original data comprises participants from 22 countries across North America and Europe. For the purpose of this study, only data from within the US was analyzed, leaving 250 responses.

Participants were asked about three aspects of their buying behaviors concerning toilet papers: the frequency they buy toilet paper in the past 14 days (shopping frequency), the amount they bought (shopping amount), and the amount they currently stock at home (inhouse amount). Analysis showed that 50% of the participants purchased toilet paper once and 6% purchased it more than twice in the past 14 days. In terms of shopping amount, 37.2% bought one packets, 12% bought two packets, and 8.4% bought three or more packets. Surprisingly, 44% didn't buy any toilet paper in the past 14 days, and when asked about inhouse amount, 72% said it was about the same amount compared to usual times whereas only 18.4% said it was more than usual [22].

In general, when looking at individual buying behaviors, people don't seem to be buying much more toilet paper than usual. However, that doesn't necessarily contradict the social level data or suggests no panic buying toilet paper in the US during the pandemic. To reach further conclusions, we need data in similar aspects but about pre-COVID behaviors, which is not available to the author of this paper. In addition, high stocking amount is not a direct manifestation of panic buying by its definition, thus many people stocking the usual amount of toilet paper during the outbreak does not imply the absence of panic buying, either.

3.2 Presence of Potential Causes

Though data on the individual level present mixed messages, data on the social level suggests an increase

in the amount of toilet paper purchased when COVID-19 first spread in the US. The following sections discussed whether the three causes of panic buying were also present during the pandemic.

3.2.1 Perceived Risk

Level of Perceived Risk The level of perceived risk was explored using the COVID-19 (Coronavirus) Survival Calculator project dataset [23]. The project was initiated by Nexoid United Kingdom, but the analysis was conducted on a sub-dataset, focusing only on the US population, adapted by the Chinese Institute of Medical Information [24]. The survey was conducted from March 29 to April 20, 2020, with a total sample of 24,547 people in the sub-dataset.

In the survey, respondents reported their perceived probability of contracting COVID-19, which is a measure of their perceived risk from the pandemic. On average, people perceived a 33.2% chance of contracting COVID-19. The distribution was right skewed (Figure 1). 17.25% of the respondents perceived the chance to be below 10%; 26.66% perceived the chance to be between 40% and 60%; and there is a small percent of respondents, 1.14%, who perceive the chance to be as high as above 90% [24]. In other words, the majority perceived the probability of contracting COVID-19 to be medium or low, but there is a small group of people who perceive the risk to be quite high.

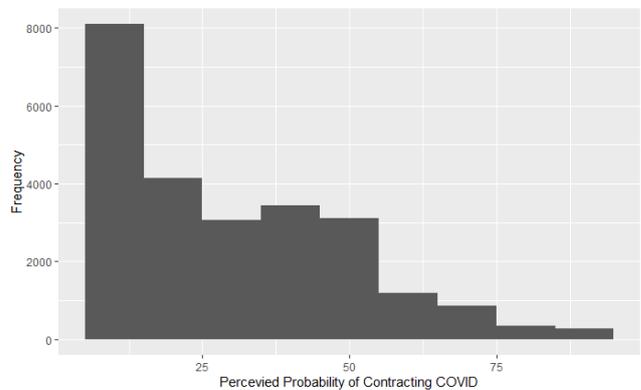


Figure 1 Histogram of the Perceived Probability of Contracting COVID

Correlations Between Perceived Risk and Buying Behaviors The data collected by Garbe and her colleagues offer opportunities to explore the association between perceived risk and toilet paper buying behaviors, specifically shopping frequency, shopping intensity, and inhouse amount [22]. Apart from these three aspects of buying behaviors, they also asked respondents to rate their perceived threat of the health crisis on a scale of 10. Correlation analysis was conducted between the level of the perceived threat and the three aspects of buying behaviors. Again, data from participants outside of the US were deleted from the

analysis because this case study is focusing on the US market.

Surprisingly, no significant correlation was found between perceived threat with any one aspect of the toilet paper buying behavior [22]. In other words, when only focusing on the US samples, the level of perceived threat and the three aspects of toilet paper buying don't seem to be significantly associated. These results are contrary to the findings in the original research, where data from participants living outside of the US were also taken into account [13]. In the original study, people who felt more threatened by the Covid-19 pandemic tended to engage in a higher level of panic buying. That is, they shopped with higher frequency, bought larger amounts of toilet paper each time they shopped, and they stocked more toilet paper at home.

3.2.2 Lack of Social Capital

Levels of social capital during the pandemic can be analyzed using the COVID impact survey dataset, a non-governmental, independent survey distributed across the US [25]. Data from the week 1 survey, conducted from April 20th to April 26th, was analyzed, with a sample size of 8790.

First, the level of social trust. 44% of the respondents reported trusting most people in their neighborhood, 41.4% reported trusting some, 6.9% none and 7.3% all. In general, the level of social trust seems to remain medium or relatively high for the majority [25].

With respect to social support, analysis was done from two aspects. First, whether and how people had changed their contact frequency with neighbors or family and friends. Compared to pre-COVID times, fewer respondents talked to their neighbors with a relatively high frequency, i.e., every day or a few times a week, whereas more respondents talked to their neighbors only once a month or not at all. A Chi-squared Goodness of Fit Test showed that the distribution of contact frequency with neighbors changed significantly between before and after the COVID outbreak ($X^2 = 72.156$, $p=0.000$), meaning that people did change how frequently they talked to their neighbors after the outbreak [25].

Meanwhile, people increased their frequency of non-in-person contact with family and friends, such as using phone or internet after the COVID outbreak. Percentage of respondents who stayed in contact with their family and friends nearly every day increased from 53.3% to 67.8%. Fewer respondents contacted their family and friends only once a month or not at all. Since people might be forced to stay at home during COVID, it is reasonable for them to get in virtual contact with their family and friends more often than before [25].

The level of social support was also analyzed from the feeling of loneliness. When asked about how many days during the last 7 days they felt lonely, 22.68% of the respondents reported 1-2 days, 8.95% 3-4 days, and there were up to nearly 7% reporting 5-7 days. 60.7% reported no feeling of loneliness at all or only feeling lonely in less than one day. In other words, more than half of the people felt socially well supported, but there are still 40% of the respondents who experienced a certain degree of lack of social support [25].

3.2.3 Anxiety Coping

The level of anxiety during COVID-19 was explored in two data sources. First, the Household Pulse Survey was conducted by the National Center for Health Statistics [26]. The institution estimated that 30.8% of the US population show symptoms of anxiety disorder from April 23 to May 5, 2020, and the estimated percentages remained to be around 30% throughout the following months. Compared with the figures in 2019, only 8.1% of the US adults (age 18 or higher) showed symptoms of anxiety disorder [26].

The second data source is the week 1 dataset of the COVID impact survey, which has been introduced in the previous section [25]. The survey included one question asking how often the respondent "felt nervous, anxious, or on edge" in the past 7 days. Analysis of this dataset showed that 21.66% of the respondents felt anxious in 1 or 2 days within the last week, and 9.18% in 3 to 4 days. Up to 7.2% felt anxious in more than 5 days of the last 7 days, implicating a high level of anxiety for those people [25].

As shown by the data from both sources, people in general experience high levels of anxiety during the pandemic.

4. CONCLUSION

Three psychological factors are proposed by previous literature to drive panic buying: perceived risk, lack of social capital, and anxiety coping. When people perceive high risks from a pandemic, they demand more hygiene products while wanting to avoid crowds, thus buying large quantities of hygiene products each time they do grocery shopping. When people experience a lack of social capital, either social trust or social support, they tend to buy more than they need. When people experience much anxiety during a pandemic, they rely on the acts of purchasing to gain a sense of relief and a sense of control.

Case study of the US toilet paper market during COVID-19 further explored the panic buying phenomenon and its causes during a pandemic. Data of the US toilet paper market showed a sudden increase in the demand for toilet paper during the pandemic. In

addition, perceived threat, lack of social capital, and high levels of anxiety all seem to be present during the pandemic among the US population, to one degree or another.

Only secondary data sources were available for this study, therefore, the phenomenon of panic buying and each of its causes could only be analyzed separately. No experiment was done thus no causal conclusions can be made. Further research can design related lab experiments and explore whether the psychological factors discussed in this paper can influence the level of panic buying people engage in.

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