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# Understanding Post-Pandemic Consumer Behavior: A Deep Dive into Mask Purchasing Willingness via the MOA Framework

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**ABSTRACT**
The COVID-19 pandemic has profoundly impacted lifestyles, rendering masks essential during the outbreak. Following the Chinese government's repeal of mandatory mask-wearing policies through the "Twenty Articles" and "New Ten Articles," this study delves into consumers' post-pandemic willingness to purchase masks. By leveraging social media and product review data, analyzed using a binary logistic regression model, the research explores the factors influencing consumers' purchase intentions. Contrary to expectations, health and safety were not the primary motivations for mask purchases, while utilitarian motives and self-efficacy exhibited a negative correlation with purchase intention. The study contributes theoretically by introducing a model grounded in the Massive Online Analysis (MOA) framework, examining motivation, opportunity, and ability factors in post-pandemic consumer behavior. Additionally, it explores signaling theory in the context of consumers' willingness to purchase masks, adding depth to the understanding of such purchasing situations. Practical implications include refining post-pandemic selling strategies for dual-use goods and informing decision-makers about policies related to epidemic prevention products. The study's insights are valuable for shaping future research on market dynamics and consumer behavior concerning epidemic prevention products..
**Keywords**: COVID-19; health issues; purchase intention; MOA framework; signaling theory

## INTRODUCTION:

The COVID-19 pandemic, triggered by a highly contagious novel coronavirus (Hsiang et al., 2020; Srivastava et al., 2022), instigated a surge in demand for protective masks, making them a pivotal commodity colloquially known as "hard currency." As a response, various Chinese enterprises swiftly established mask production lines to meet the escalating demand. Despite the World Health Organization's declaration on May 5, 2023, that the pandemic no longer constituted a "Public Health Emergency of International Concern" (WHO, 2023), its aftermath continues to unfold with significant implications for global uncertainty, economic dynamics, and societal interactions (IMF, 2021; Mehrolia et al., 2021; Rakshit et al., 2021; Huo et al., 2022).

As the impact of the outbreak gradually diminishes, observable shifts in consumer behavior become apparent. The perceived severity of the pandemic is now intricately tied to the willingness to purchase, indicating a heightened focus on personal and family health considerations (Wang et al., 2022). Understanding consumers' willingness to buy masks becomes imperative for optimizing the supply-demand structure, implementing supply-side reforms, and fostering the sustainable growth of the mask industry.

Crisis awareness during COVID-19 continues to exert a positive influence on purchase intention (Ma et al., 2023). Consumers exhibit a robust willingness to buy masks, primarily driven by considerations of safety, adherence to social distancing norms, and the imperative need for health protection in public spaces. The scarcity of masks during the pandemic elevated them to a necessity, leading to diversified motivations for purchasing masks. Beyond health protection, consumers are motivated by social responsibility, using masks to mitigate disease transmission risks, and fashion/personality, viewing masks as personal accessories expressing style and individuality. Merchants have responded by introducing a variety of mask styles to cater to these diverse motivations.

China, a major contributor to global mask production, boasts a rich history in the mask market dating back to the late Qing Dynasty. The modern era's mask market gained prominence during events like the Northeast Plague in 1910 and the SARS outbreak in 2003. With the official implementation of "Category B control" for new coronavirus infections, China's epidemic prevention

policies have evolved. Emphasizing guidelines for public mask-wearing to prevent infections, the relaxation of mandatory mask-wearing in public places has led to a decline in mask usage, especially outdoors, showcasing shifts in behavior compared to the peak of the epidemic.

The paper's primary research questions focus on comprehending the mechanisms influencing mask sales in the post-epidemic era and exploring consumer motivations and needs for purchasing masks during this period. In contrast to existing studies predominantly relying on questionnaires for data collection, this paper adopts Python crawler technology to gather social media content and e-commerce product reviews. The subsequent analysis, conducted through binary logistic regression, aims to provide nuanced insights into consumer behavior post the pandemic.

The subsequent sections of the paper encompass a thorough review of existing research, theoretical perspectives, and the formulation of hypotheses. The third section outlines the modeling framework based on theoretical assumptions, while the fourth section meticulously analyzes the collected data, validates the model, and interprets the relationships between the Massive Online Analysis (MOA) framework, signaling theory, and purchase intention. The fifth section concludes the study, underscoring theoretical and managerial contributions, summarizing findings, and proposing recommendations for future research and practical applications.

## 2. Literature Review and Theoretical Perspectives

The COVID-19 epidemic has exerted a profound influence on various aspects of social life (Al Sham et al., 2022), prompting extensive research on its repercussions on consumer behavior post-pandemic. Investigations have predominantly focused on specific domains, such as alterations in purchasing channels, particularly the surge in online purchases due to the absence of offline options in Japan (Inoue & Todo, 2023). The pandemic has instigated a noteworthy shift from offline to online purchasing behaviors. Consumer behavior, post-COVID-19, has been classified into three categories based on perceived risk: moderate, aggressive, and hesitant. Aggressive consumers prioritize quality and convenience in their purchasing decisions (Sawang S et al., 2023). Moreover, there is an escalating concern regarding health issues, particularly in the context of food-related studies, impacting goods such as freshwater fish, certified food online purchases, smartphone acquisitions, online green food purchases, e-purchasing behavior among college students, and private car purchases (Chen et al., 2022; Qi et al., 2021; Rakib et al., 2021; Aboulilah et al., 2022; Mao et al., 2023).

Consumer perceptions of the epidemic's severity significantly and positively influence their willingness to buy organic food (Wang et al., 2022). The decision-making process is shaped by other consumers' purchase experiences, influenced by two types of cues: action-based social information (peer consumer purchases) and opinion-based consumer information (peer consumer reviews), with action-based social information exerting a more significant influence (Ludwig et al., 2022; Ludwig et al., 2023; Ludwig et al., 2013; Cheung et al., 2014). Positive affect in online reviews has a favorable impact on perceived product quality, and user reviews play a crucial role in product information efficiency, particularly when perceived empathy or cognitive effort is high (Jabr et al., 2022; Wang et al., 2020). Reviews act as purchase signals, stimulating consumer willingness to buy. For utilitarian goods, reviews with low falsity levels can enhance online purchase intentions (Song et al., 2023). In line with signaling theory, return and exchange policies, serving as expensive market mechanism signals (Oghazi et al., 2018), function as promises from sellers to consumers. These policies foster trust, thereby enhancing purchase intention.

Dincer et al. (2023) conducted a thorough review of social commerce research and consumer willingness to buy spanning the past decade. Within this domain, the exploration of purchase intention, defined as the likelihood that beliefs and attitudes will manifest into a consumer's anticipated or planned future behavior, stands out as a pivotal focus (Engel et al., 1982). Purchase intention engages cognitive processes, encapsulating thoughts like "I have to do..." or "I am going to do...," indicative of an individual's inclination towards a prospective purchase (Kim et al., 2013). Specifically, it signifies the probability of acquiring a service or product in the future.

Importantly, the framing of epidemic-related information by the media during a pandemic can evoke diverse emotional responses from the public. Media reporting, often laden with figurative elements, has evolved into an additional source of anxiety and anger for the public, distinct from the direct impact of the COVID-19 epidemic itself (Wang et al., 2023). This emphasizes the dynamic interplay between media influence, emotional responses, and consumer behavior, where the anxiety induced by media reporting may fuel the consumer's inclination to make purchases. The intricate relationship between media framing and its impact on public sentiment emerges as a significant factor influencing consumer decision-making and the willingness to purchase.

In current research addressing the willingness to purchase items during the epidemic, the predominant research methodology involves the utilization of empirical research questionnaires for structural equation modeling analysis. For instance, in a study predicting consumers' willingness to purchase green products and behavioral attitudes during the new Crown Pneumonia (Chen et al., 2022), data collection involved surveys conducted among 503 consumers in Malaysia. The Partial Least Squares method was employed for data analysis. While survey questionnaires offer advantages in terms of efficiency and cost-effectiveness for data collection, they are not without potential methodological limitations and biases.

One notable limitation is self-report bias, where respondents may be susceptible to memory distortions, social expectations, and subjective interpretations, introducing heightened subjectivity and uncertainty into the data. Conversely, fewer studies have utilized data mining, a highly efficient and comprehensive method that

automatically extracts information and correlation patterns hidden in large-scale data through pattern discovery.

Regarding the time horizon, existing studies have predominantly focused on the willingness to buy and the behavioral attitudes of consumers toward specific types of goods during the COVID-19 pandemic. Presently, with the stabilization of the COVID-19 pandemic, fewer studies have explored the new scenario that follows. Therefore, it becomes crucial to investigate changes in consumers' willingness to purchase and behavioral attitudes, particularly towards masks, which serve a dual purpose in epidemic prevention and general use, in the new scenario post the recent epidemic.

### 2.1 Signal Theory

The signal theory, initially proposed by the American economist Spence (1973), revolves around three fundamental components: the signal sender, the signal itself, and the signal receiver. Primarily applied to situations characterized by information asymmetry between buyers and sellers, the theory posits that various signals emitted by different sources influence the consumer's response. Mask-related signals encompass perceived risk indicators, such as outbreak information and advice from medical experts, alongside media anxiety signals, all of which evoke consumer concerns for health and safety, consequently bolstering the motivation to purchase masks. Sales channels for masks, including advertisements and mask-related content on social media, contribute signals influencing the perceived opportunity for mask acquisition. These signals may involve price information, discount promotions, or economic factors associated with masks. When consumers receive price-related signals, they assess whether the economic burden aligns with their purchasing capacity, impacting their willingness to buy. Favorable pricing signals can enhance consumers' perceptions of mask availability and convenience, thereby influencing purchase intent.

Perceived risk and social influence function as signaling mechanisms shaping purchase intention. Media signals concurrently disseminate information about the epidemic, including outbreak details and advice from medical experts, serving as perceived risk signals. These risk signals heighten individuals' concerns for personal health and safety, motivating them to acquire masks. Social influence signals, emanating from social media messages, advertisements, and economic information like mask prices and discounts, act as motivators driven by social factors, prompting consumers to consider mask purchases. Building on Spence's (1973) signaling theory, the subsequent hypotheses are formulated:

**H1a**: Consumer perceived risk positively influences consumer purchase intention.

**H1b**: Social influences positively influence consumers' purchase intentions.

### 2.2.2 Massive Online Analysis (MOA) framework

The MOA framework theory proposed by MacInnis is a theoretical framework that includes three dimensions of motivation, opportunity, and ability to explain the process of consumer purchase intention formation.

Motivation serves as the driving force behind an individual's inclination to engage in specific behavior and encompasses two distinct dimensions: utilitarian and social motivation. Utilitarian motivation pertains to consumers donning masks for practical reasons, such as health protection and maintaining a safe social distance. On the other hand, social motivation is influenced by external pressures, encompassing observations of others wearing masks in public and requests from family, friends, and coworkers. Motivation, as the foundation of human agency and volitional behavior (Hattie et al., 2020), plays a pivotal role in shaping decision-making behaviors. The purposeful motivation of an individual significantly influences their decision-making processes, particularly in the context of consumers' willingness to purchase, which is influenced by a myriad of factors.

Within the realm of self-determination theory, behavioral motivation demonstrates a predictive effect on the extent of participation in social life. External incentives and social norms act as behavioral influencers, shaping consumer behavior in various contexts (Radel et al., 2017; Melnyk et al., 2022). In traditional and conservative social environments, social norms have a growing influence over time, particularly for socially sanctioned behaviors. Amid a pandemic, personal health and safety protection have become social norms, evidenced by widespread adherence to regulations such as wearing masks. This socially approved behavior continues to have enduring impacts even after the pandemic concludes, as observed in the persistent practice of wearing masks in public places.

Distinct purchase motives yield varied perspectives on product consumption. Hedonistic motives, rooted in pleasure-based consumption, lead to more extensive product search efforts compared to utilitarian motives (Whitley et al., 2018). Hedonistic consumers tend to exhibit distinctive product preferences, complicating the product search process. Applying the MOA framework, individuals motivated by utilitarian considerations when purchasing masks are likely to exhibit a significantly increased purchase intention. Specifically, motivations related to health protection and safety factors positively influence the intention to purchase masks. Social motives also play a substantial role, with individuals expressing a higher willingness to purchase masks when influenced by social factors, such as observing others wearing masks or receiving requests from family, friends, and coworkers. Therefore, the following hypothesis is posited:

**H2a**: Utilitarian motivation positively influences consumers' purchase intention.

**H2b**: Social motivation positively influences consumer purchase intention.

The concept of opportunity within the context of consumer behavior refers to situations where external environmental conditions influence an individual's response, acting as an external driver that reflects the degree to which external conditions facilitate an individual's actions. Economic conditions, representing

consumers' income levels, play a crucial role in shaping purchasing decisions. During the initial stages of the epidemic, the price of masks may have been higher, but as the situation stabilizes, and the price tends to normalize, consumers must evaluate their willingness to pay the corresponding price for mask purchases.

Purchase channel convenience, encompassing the accessibility of mask sales channels, significantly influences consumer behavior. A seamless channel facilitates the flow and consumption of goods. In the context of the COVID-19 pandemic's impact on Japan, where several prefectures entered a state of emergency, offline purchasing channels were limited, prompting a surge in purchases through major online platforms (Inoue & Todo, 2023). Economic conditions, whether good or bad, also shape consumers' willingness to make purchases, with favorable economic conditions facilitating purchasing decisions.

According to the opportunity dimension of the MOA framework, when consumers perceive the purchase channel for masks as inconvenient, their willingness to purchase is significantly diminished. Inconvenience may stem from the unavailability of offline channels or the unreliability of online options, leading consumers to be less inclined to purchase masks due to the associated inconvenience. Moreover, an individual's economic condition positively influences their willingness to buy masks. Better economic conditions increase individuals' affordability of mask prices, fostering a greater inclination to make purchases. This highlights the facilitating effect of economic conditions on willingness to purchase. Consequently, the following hypothesis is posited:

**H3a**: Purchase channel has a positive effect on consumers' willingness to buy.

**H3b**: Economic conditions have a positive effect on consumers' willingness to buy.

Competence, within an individual's context, is reflective of their potential for action, encapsulating both ability and self-efficacy—the belief in one's capability to execute a particular task. Self-efficacy involves an individual's judgment and prediction of whether they possess the necessary capabilities to achieve a specific goal. Those with self-efficacy can accurately assess their own capabilities (Bandura, 1993), subsequently setting goals and taking actions. In the realm of purchasing masks, competence is manifested through consumers' knowledge about masks and their self-efficacy in wearing them for personal health protection. While self-efficacy and perceived control exhibit a strong correlation, they independently contribute to predicting behavior (Tsai, Chang, & Peng, 2016). Studies have shown that enhancing consumers' perceived control and increasing self-efficacy result in stronger purchase intentions (Li et al., 2018). According to the capability dimension of the MOA framework, consumers' willingness to purchase masks significantly rises when they have a heightened sense of self-efficacy in wearing them correctly. This confidence represents an expectation that wearing the mask will effectively contribute to personal health protection. Consequently, individuals with higher self-efficacy are more inclined to take action and purchase masks. Moreover, the MOA framework suggests that individuals' knowledge about masks positively influences their willingness to purchase. A well-informed understanding of masks enhances the ability to recognize their value in health protection. Hence, individuals with more knowledge demonstrate a greater inclination to purchase masks. In light of these insights, the following hypothesis is formulated:

**H4a**: Self-efficacy has a positive effect on consumer purchase intention.

**H4b**: Competence has a positive effect on consumer purchase intention.

The MOA framework theory allows for an in-depth analysis of the process of consumer purchase intention formation, integrating the three key dimensions of motivation, opportunity, and ability to better understand the influencing factors that consumers face in their mask purchase decisions.

## 3. Model Construction

### 3.1 Modeling

This study integrates the MOA framework theory and signaling theory to formulate an analytical model elucidating consumers' willingness to purchase masks, as illustrated in Figure 1. The MOA framework comprises three integral dimensions: motivation, opportunity, and ability. Motivation encompasses utilitarian motivation and social motivation, while opportunity involves economic conditions and purchasing channels. The capability dimension encompasses self-efficacy and knowledge level. The MOA framework plays a pivotal role in influencing consumers' purchase intentions. Signaling theory complements this framework by elucidating the process through which consumers perceive and cognize its dimensions, subsequently impacting their purchase intentions. By analyzing the signals consumers receive and interpret from their environment, we gather insights into their perspectives on epidemic-related information, opinions, attitudes, remarks, concern levels, and perceptions of protective measures. This information enables us to assess and gather feedback on consumers' perceived risk.

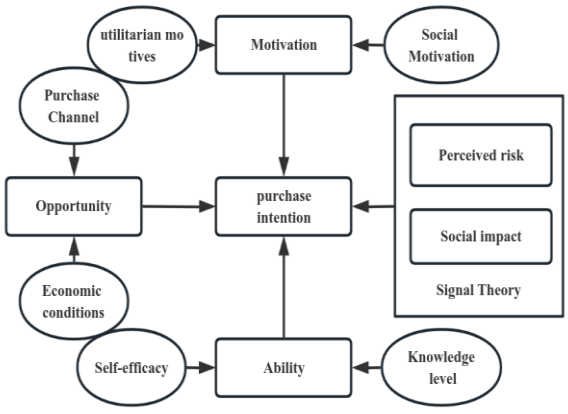


**Figure 1: Research model**

This study centrally focuses on investigating the impact of MOA framework factors on the willingness to purchase masks. The key explanatory variable is the willingness to purchase, categorized as either "willing" or "unwilling," forming a dichotomous variable. To analyze this binary variable, we employ a binary logistic regression model. In this model, consumer willingness to purchase is denoted as "y=1," whereas unwillingness to purchase is represented as "y=0." Hence, the binary logistic regression model is employed to assess the likelihood of consumers being willing to buy ("y=1") or unwilling to buy ("y=0"). The fundamental structure of the model is outlined as follows:

$$\boldsymbol{Ln}\left(\frac{\boldsymbol{p(y=1)}}{\boldsymbol{1-p(y=1)}}\right) = \boldsymbol{\alpha}+\sum_{\boldsymbol{i=1}}^{\boldsymbol{k}} \boldsymbol{\beta_i x_i}. \quad (1)$$

Then the probability of willingness to buy is:

$$\boldsymbol{p(y=1|x)} = \frac{\boldsymbol{e^{\alpha+\sum_{i=1}^{k}\beta_i x_i}}}{\boldsymbol{1+e^{\alpha+\sum_{i=1}^{k}\beta_i x_i}}}. \quad (2)$$

In this context, $y$ represents the explanatory variable denoting purchase intention, and $x_i$ signifies the $i^{th}$ independent variable influencing consumers' willingness to purchase masks. The symbol "$p$" represents the probability of purchasing masks, while "$1$-$p$" indicates the probability of not making a purchase. The ratio "$p/(1-p)$" is a crucial element in logistic regression, where "$k$" stands for the number of explanatory variables. The model incorporates an intercept term denoted by "$\alpha$," and the coefficient "$\beta_i$" is assigned to the explanatory variable $x_i$. This coefficient signifies both the direction and magnitude of the variable's impact on the willingness to purchase. Typically derived through the maximum likelihood estimation method, the term "e^($\beta_i$)" reflects the multiplicative change in the odds of the event with each 1-unit alteration in the explanatory variable $x_i$.

### 3.2 Variable Settings

In this paper, we refer to the MOA framework and signaling theory, set the following variables with the actual research, and explain them, as shown in Table 1.

## 4. Model Validation

### 4.1 Data Acquisition and Processing

To validate the robustness of our research model, this study employed a mixed-method data collection strategy. Initially, data pertaining to mask purchase intentions, including consumers' motivations, opportunities, and abilities, were gathered from diverse social media platforms. Additionally, relevant product review data were collected to comprehend consumers' ratings and opinions on various mask products. Python was utilized to crawl the first 500 pages of Sina Weibo posts using search terms such as "mask," "mask purchase," and "COVID-19," resulting in a total of 1,500 posts. The Octopus data collector, an ongoing tool, was employed to amass more than 1,500 posts and 1,000 comments related to mask purchases from select stores on e-commerce platforms. Post-processing involved the removal of duplicate comments, subwords, and deactivated content, resulting in 901 product comments and 681, 456, and 435 Weibo-related keyword postings, respectively.

**Table 1: Variable definitions and measurements**

| Variable type | Variable name | Variable Measurement Methods | Measuring scale |
|---|---|---|---|
| | Motivation | M1 utilitarian motives | **Keywords include:** Whether it is for the purpose of health protection, safe social distance, if the keywords "health", "safety", "prevention", etc. appear, if these keywords appear in the posting/comment, then If the keywords "health", "safety", "prevention" appear, if these keywords appear in the posting/comments, then M1 can be determined as: Yes= "1", No= "0". |
| | | M2 Social Motivation | **Keywords include:** references to 'people around',' coworkers', 'family', 'friends', and interactions with Interactions with others' behaviors, e.g., "everyone else is wearing a mask," "everyone is wearing a mask," etc.<br>If these keywords appear in the comment or refer to content related to the behavior of others, M2 can be determined: Yes = "1", No = "0". |
| | Opportunity | O1Purchase Channel | **Keywords include:** "buy", "store", "online shopping", "online shopping", etc. If these purchase-related keywords appear in a posting/comment, O1 can be determined as Yes= "1", No= "0". |
| | | O2 Economic conditions | **Keywords include:** "price", "cost", "affordability", "burden", etc. If a comment mentions the price, financial burden or |

| | | | |
|---|---|---|---|
| independent variable | | | affordability of the mask, the O2 can be determined as: yes = "1", no = "0". |
| | Ability | A1 Self-efficacy | **Keywords include:** "confidence", "effectiveness", "protection", etc. to indicate. If the comment mentions the protection of health by wearing the mask, as well as content related to confidence and effectiveness, A1 can be determined as: Yes = "1", No = "0". |
| | | A2 Knowledge level | **Keywords include:** "knowledge", "understanding", "information", etc. to indicate. If the comment mentions knowledge about masks or related protection, A2 can be determined as: Yes = "1", No = "0". |
| | Signal theory | S1 Perceived risk | **Keywords include:** "risk", "outbreak", "safety", etc.<br>If the comment mentions a perception of an outbreak, safety-related concern or reference to risk, S1 can be determined as: Yes = "1", No = "0". |
| | | S2 Social impact | **Keywords include:** "media", "information", "news", etc. If thecomment mentions the influence of media, news, or other social information on the purchase of masks, S2 can be determined as: Yes = "1", No = "0" |
| implicit variable | Purchase intention | p | Keywords include: "buy", "willing", "buy", etc.<br>If there is a keyword in the comment that expresses a willingness to buy, it can be determined that P is: Yes = "1", No = "0". |

**Table 2: Descriptive statistics of data**

| Byword | Data sources | data volume | Effective data volume |
|---|---|---|---|
| respirator | Sina Weibo | 681 | 664 |
| Buy a mask | Sina Weibo | 456 | 445 |
| COVID-19 | Sina Weibo | 435 | 423 |
| Mask Purchase Review | JD | 901 | 835 |

Upon completion of data collection, an extensive set of processing and cleaning procedures was undertaken on the acquired data. Initially, the text data underwent preprocessing, involving the elimination of noise, special symbols, and deactivated words. Subsequently, manual labeling procedures were applied to the data, allowing for the segmentation of information into distinct dimensions. This structured dataset was then utilized in subsequent model analyses.

4.2 Model validation

In this study, the Hosmer-Lemeshow test was used to assess the fit of the binary logistic regression model. This test is used to compare the difference between the probability values predicted by the model and the actual observed probability values to determine whether the model fits the data or not. The statistical results of the Hosmer-Lemeshow test have been compiled in Table 2. According to the results of the test, the p-value is 0.239, a value that is significantly greater than the significance level of 0.05, indicating that the fit of the model is statistically significant. Specifically, through the findings of the Hosmer-Lemeshow test, it can be inferred that the model performs well in fitting the data and is consistent with the actual observed data.

**Table 2: Hosmer-Lemeshow goodness of fit test**

| | | P=0 | | P=1 | | |
|---|---|---|---|---|---|---|
| | | Observed | Expected | Observed | Expected | Total |
| Step 1 | Group 1 | 36 | 36.000 | 104 | 104.000 | 140 |
| | Group 2 | 3 | 3.000 | 55 | 55.000 | 58 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Step 2 | Group 1 | 20 | 21.345 | 44 | 42.655 | 64 |
| | Group 2 | 16 | 14.655 | 60 | 61.345 | 76 |
| | Group 3 | 3 | 1.655 | 19 | 20.345 | 22 |
| | Group 4 | 0 | 1.345 | 36 | 34.655 | 36 |
| Goodness-of-fit Statistic=2.861with 2DF (p=0.239>0.05) | | | | | | |

In the analysis of linear regression, the least squares method is commonly employed to estimate unknown overall parameters. Another widely utilized approach for parameter estimation is the maximum likelihood estimation method. Unlike the least squares method, the maximum likelihood estimation method exhibits broader applicability, extending beyond linear models to encompass more intricate nonlinear situations. Given that the model in this study is Logistic regression—a nonlinear model—the maximum likelihood estimation method is the preferred choice for parameter estimation. For a comprehensive presentation of results, kindly refer to Table 3.

**Table 3: Analysis of very high likelihood estimation**

| Variable | Parameter Estimate | Standard Error | DF | Wald Chi-Square | Pr>Chi-Square | EXP (B) |
|---|---|---|---|---|---|---|
| INTERCPT | 3.249 | 0.628 | 1 | 26.726 | 0.000 | 25.758 |
| M1 | -1.817 | 0.626 | 1 | 8.415 | 0.004 | 0.163 |
| M2 | - | - | 1 | - | 0.724 | - |
| O1 | - | - | 1 | - | 0.137 | - |
| O2 | - | - | 1 | - | 0.549 | - |
| A1 | -0.739 | 0.374 | 1 | 3.915 | 0.048 | 0.477 |
| A2 | - | - | 1 | - | 0.400 | - |
| S1 | | - | 1 | - | 0.940 | - |
| S2 | - | - | 1 | - | 0.095 | - |

Based on the above analysis and measurement of the great likelihood estimation, the logistic regression analysis equation can be derived as:

$$Logitp=3.249-1.817M1-0.739A1. \quad (3)$$

The independent variables encompass M1 utilitarian motivation and A1 self-efficacy, with the dependent variable denoted as "p." Through the Logit transformation, the probability of a consumer being willing to purchase a mask is derived. Specifically, for the independent variable utilitarian motivation, the exponential regression coefficient (EXB) stands at 0.163. This signifies that a one-unit increase in utilitarian motivation results in the odds of the dependent variable (willingness to purchase) occurring relative to a one-unit decrease, reducing to the original value of approximately 0.837. Regarding self-efficacy, the exponential regression coefficient (EXB) is 0.477, indicating that the odds of the dependent variable (purchase intention) occurring relative to a one-unit decrease in self-efficacy will be reduced to approximately 0.523.

Exploring other factors, including the independent variables of social motivation M2 in the motivation dimension, purchase channel O1, economic conditions O2 in the opportunity dimension, level of knowledge A2 in the ability dimension, perceived risk S1 in signaling theory, and social influence S2, none exhibit significant p-values in statistical analyses. The correlation hypothesis cannot be rejected. Potential explanations include the societal shift towards reduced mask-wearing in public places under the influence of social motivation. From an opportunity perspective, the recovery of the economy and increased openness of the purchase channel contribute to enhanced circulation, while the decreased production cost of masks minimizes economic impact. In terms of the ability dimension, public awareness of basic mask-related information during the epidemic may contribute to the non-significant impact. Within the signaling theory, the lack of significance in perceived risk and social influence may be attributed to diminishing media coverage of the

epidemic, leading consumers to believe in reduced infection risks after receiving relevant information.

### 4.3 Analysis of results

The model elucidates the influence of the MOA framework theory on consumers' mask purchase behavior after the outbreak of the new coronavirus. The findings reveal a negative correlation between consumers' utilitarian motivation, self-efficacy, and purchase intention. In other words, consumers with higher utilitarian motivation or stronger self-efficacy demonstrated a lower inclination toward purchasing masks.

In the great likelihood estimation analysis (refer to Table 3) of the signaling theory's two dimensions, perceived risk, and social influence, the p-values are 0.940 and 0.095, respectively, with the Parameter Estimate value undisclosed. Consequently, the original hypothesis H1a, asserting that perceived risk signaling lacks a significant positive effect on mask purchase intention, cannot be dismissed. This implies that these two dimensions exhibit no statistically significant impact on mask purchase intention. Specifically, the analysis of the perceived risk dimension yields a p-value of 0.940, failing to reject hypothesis H1b. Despite exploring the potential relationship between perceived risk and purchase intention, the study lacks adequate evidence in the sample to substantiate the statistical significance of this relationship. As for the Social Influence dimension, the p-value of 0.095, although not meeting the conventional significance level of 0.05, indicates a noticeable trend. Nevertheless, the undisclosed Parameter Estimate value precludes a precise determination of the Social Influence Dimension's exact impact on purchase intentions. These outcomes suggest that the perceived risk and social influence dimensions might have a relatively weak role or that there could be unaccounted variables in the study of mask purchase intention. Additionally, the results may be influenced by the sample size and data limitations.

H2a: The Parameter Estimate value is -1.817 with a p-value of 0.004. This result indicates that individuals motivated by health protection or safety factors tend to decrease their willingness to purchase masks. This finding contradicts the initial hypothesis, suggesting that health protection and safety motives may conflict with the willingness to purchase masks in specific contexts. Possible reasons for this unexpected finding include:

Trust factors: Some individuals may doubt the effectiveness of masks, perceiving limited protection and, as a result, may be reluctant to purchase them.

Feasibility of alternatives: Individuals might believe in alternative effective health protection methods, such as social distancing and regular handwashing, making masks seem unnecessary.

Reverse social pressure: Some individuals may resist purchasing masks due to perceived coercion or strong recommendations, leading to resentment and a choice not to buy masks.

H2b: The Parameter Estimate value is not shown with a p-value of 0.724. Sufficient evidence could not be found to support a significant increase in willingness to purchase masks due to social motivation. This suggests that social motivation does not significantly elevate the willingness to purchase masks, aligning with the original hypothesis.

H3a: The Parameter Estimate value is not shown with a p-value of 0.137. Adequate evidence could not be found to support that inconvenience of purchasing channels significantly reduces the willingness to purchase masks. This implies that perceived inconvenience in purchasing channels did not statistically significantly diminish mask purchase intention, and the original hypothesis H3a could not be rejected.

H3b: The Parameter Estimate value is not shown with a p-value of 0.549. Sufficient evidence could not be found to support a significant positive effect of an individual's economic condition on mask purchase intention. This indicates that individuals' economic conditions do not contribute statistically significantly to the willingness to purchase masks, and the original hypothesis H3b could not be rejected.

The weakening influence of purchasing channels and economic conditions on willingness to purchase masks may be attributed to the decreased price and improved availability of masks during the study period.

H4a: Based on the capability dimension of the MOA framework, consumers' willingness to purchase masks will significantly increase when they have greater self-efficacy for wearing masks. The results show that individuals' self-efficacy for mask wearing had a significant negative effect on mask purchase intention (Parameter Estimate = -0.739, $p < 0.05$). This implies that individuals with lower self-efficacy are more likely to show a tendency to purchase masks, possibly due to their lack of confidence in proper mask usage and their role in health protection.

Despite the initial hypothesis, this result deepens the understanding of purchase intention drivers. Individuals may consider masks unnecessary if they believe in the effectiveness of alternative health protection measures, such as handwashing or vaccinations. Concerns about mask interference with comfort or communication in specific contexts may also reduce willingness to purchase.

These findings underscore the challenge of promoting mask wearing during a crisis. Governments and health authorities should address individuals' concerns, provide information about mask effectiveness and proper usage, and enhance mask comfort and convenience.

H4b: Based on the competency dimension of the MOA framework, an individual's knowledge about masks will positively influence their willingness to purchase masks. However, the results did not show a significant effect of individuals' knowledge about masks on their willingness to purchase (Parameter Estimate = not shown, $p = 0.400$). This suggests that mask purchase decisions may be influenced more by other factors than just knowledge level.

## Discussion

This paper investigates consumers' inclination to use face masks post-COVID-19. The research data unequivocally indicates a diminished willingness among consumers, attributed to utilitarian motives and self-efficacy. One contributing factor is the stabilized situation of the new crown epidemic, marked by the WHO's declaration on May 5, 2023, that it no longer constitutes a "public health emergency of international concern." Additionally, from the perspective of self-efficacy, consumers perceive masks as less beneficial, unattractive, and potentially problematic during summer due to increased temperatures, collectively influencing a decrease in consumers' willingness to purchase face masks.

5.1 Theoretical contributions

This study integrates the MOA framework to investigate consumers' mask purchase intentions post-new coronary pneumonia, thereby expanding the theoretical scope of the MOA framework in the marketing field. The study identifies that within the motivation dimension of the MOA framework, utilitarian motivation adversely impacts consumers' willingness to purchase masks. This challenges the conventional notion that higher motivation leads to increased purchase intention, indicating that emotional and social factors may play a more significant role during epidemic scenarios. This theoretical insight enriches the MOA framework's content, emphasizing the need to consider emotional and social influences alongside utilitarian motives when analyzing purchasing behavior. It also suggests potential avenues for future research to explore the contextual importance of motivational dimensions.

In the ability dimension, the study reveals a negative impact of self-efficacy on consumers' willingness to purchase masks during the COVID-19 pandemic. Contrary to the typical positive view of self-efficacy, this finding underscores the influence of external factors constraining self-efficacy in crisis situations, diminishing its positive impact on purchase decisions. This provides a novel perspective on consumer behavior during epidemics and highlights the need for marketers to focus on product effectiveness and reliability in their communications to enhance consumers' self-efficacy and encourage purchasing behavior.

The study further explores signaling theory in the context of mask purchasing but finds no significant impact on consumers' purchase intentions. This result prompts reflection on the applicability of signaling theory, suggesting that signals may have varying effects in different consumption situations. The study recommends future research to delve into the specific contexts where signaling theory proves more influential. The insights from this exploration also guide marketers to consider alternative factors, such as product features, price, and brand reputation, in their communication and marketing strategies.

In summary, this study offers a comprehensive analysis of motivation, opportunity, and ability factors within the MOA framework in the context of mask purchase decisions. While signaling theory did not exhibit significance in this study, the attempt to incorporate it provides valuable ideas for future research. The findings contribute to the theoretical understanding of consumer behavior, offering practical references for the development of marketing strategies.

5.2 Practical contributions

This study reveals a trend of declining consumer willingness to purchase protective products, such as dual-use goods for epidemic prevention and general use, in response to the New Crown Pneumonia epidemic through an in-depth exploration of consumers' willingness to purchase masks in the aftermath of the New Crown epidemic. This finding has important practical implications:

(1) Discovered a mechanism that improves selling strategies by increasing the willingness to buy dual-use goods for epidemic prevention and general use after a pandemic.

In response to market changes during the epidemic, business decision-makers can use the results of this study to adjust sales strategies and inventory management. Understanding the decrease in consumers' willingness to buy can help avoid overproduction, reduce inventory costs, and better meet market demand. This finding has important implications for marketing strategy development. Traditional marketing usually focuses on the utilitarian features and functions of a product, but in special times, the influence of emotional and social factors may override utilitarian considerations. Therefore, marketing campaigns could place more emphasis on the social responsibility of dual-use goods in the mask category and the emotional value of fighting the epidemic together in order to attract more consumers. In addition, this result reminds researchers and marketing practitioners that the motivations behind purchase decisions are multidimensional and need to be considered holistically. Different motivational factors may have different impacts in different contexts, and thus, personalized marketing strategies may be more targeted and effective.

(2) Provide policy improvement and sales strategies for dual-use commodities with epidemic prevention and generalization for the decision-making authorities.

Government and health departments can use the findings of this study to develop targeted public health promotion policies. Knowing the reasons for the decline in willingness to purchase, the government can better communicate messages about the importance and proper use of dual-use commodities, such as masks, for epidemic prevention and general use, in order to increase public health awareness. With the knowledge of the reasons for the decline in willingness to buy, the government can more accurately convey messages about the importance and proper use of dual-use commodities. Such targeted campaigns can be tailored to different groups of consumers, with messages personalized according to their differences in motivation, opportunity and ability. For example, for consumers who score low on utilitarian motivation, governments could focus on the importance of dual-use commodities for health protection, emphasizing that wearing masks can or will reduce the risk of infection. For consumers who scored low on self-efficacy, detailed instructions on the proper wearing of masks could be provided to increase their confidence. For

consumers who scored low on access and affordability, the government could introduce price incentives or provide easy access to masks to lower their threshold for purchase.

Through this targeted publicity policy, the government and the health sector can better meet the needs of different consumer groups and raise public health awareness, thereby controlling and preventing the spread of infectious diseases more effectively. This helps to protect the overall health of the community, reduce the risk of epidemic transmission and provide a safer living environment for the public. Therefore, this study has positive practical implications for the formulation and implementation of public health policies.

6 Conclusion

Understanding consumers' motivations for purchasing behavior during a crisis can help all sectors better prepare for and respond to future challenges. The results of this study are not only important in the context of the COVID-19 epidemic, but also provide valuable lessons for similar crisis situations that may arise in the future. Emergencies such as natural disasters, public health crises, or socio-economic changes can be faced across the globe, and these situations can have far-reaching effects on markets and consumer behavior. By gaining a deeper understanding of what motivates consumers' purchasing behavior, we can better prepare for and respond to future challenges and take targeted measures to maintain the stability of societies and the health of markets.

The limitations of this study should be acknowledged. Firstly, the heavy reliance on social media data and product reviews for analyzing consumers' purchase intentions while providing valuable insights may have limitations in capturing consumers' intricate psychological and emotional states. Future research avenues could explore more diverse data sources, such as experimental data or survey data, to offer a more comprehensive understanding of consumer behavior.

Secondly, the focus on masks as a key product during the epidemic might limit the generalizability of findings to other dual-use goods like protective gear and medical supplies, which also gained attention. Future studies could broaden the scope by including a wider range of products to explore consumer behavior across various categories.

Thirdly, the study is centered on the Chinese context of the epidemic, and variations in epidemic conditions, cultural disparities, and policy environments in different countries and regions may impact consumer behavior differently. Cross-cultural comparisons should be approached with caution, emphasizing the need for context-specific interpretations and generalizations to international contexts.

Lastly, despite the attempt to integrate the MOA framework with signaling theory, the study found no significant influence of signaling theory on the mask purchase context. This may be attributed to operationalization issues or research methodology related to signaling theory. Further in-depth research is warranted to elucidate the reasons behind this finding and refine the integration of these theoretical frameworks.

Collectively, these limitations pave the way for future research endeavors, offering opportunities to deepen the understanding of consumer behavior by addressing methodological gaps, expanding product categories, considering cross-cultural nuances, and refining the integration of theoretical frameworks..

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