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## COVID-19 Masks in terms of Functional, Expressive, and Aesthetic Consumer needs

Lily Highley

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**COVID-19 Masks in terms of Functional, Expressive, and Aesthetic Consumer needs**

Lily Highley

University of Arkansas

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### **Abstract**

The purpose of this study was to assess consumers perspectives of COVID-19 masks under the functional, expressive, and aesthetic areas. Due to the COVID-19 pandemic, masks have become an “accessory” to everyday life, and it was essential to research masks under these unique areas and explore consumer perceptions.

This study took place after background research on the topic and the FEA model. The study included a survey sent to Bumpers College students upon approval from the IRB. The data was analyzed and interpreted specifically in the FEA areas and can be useful to better understand the students at the University of Arkansas’ perspectives on masks.

Overall, the study found that in terms of function, majority of the students are satisfied, however, concerns like fogging in glasses, skin irritation, difficulty in breathing, coverage provided and more need to be addressed to increase the rate of mask adherence. In terms of expressiveness, the mask does not compromise body language, value of oneself, but does affect non-verbal communication and makes majority of students feel socially responsible. Lastly, majority of students expressed dissatisfaction in the aesthetics area; to increase user acceptance, the style, fashion, and color of the mask need to be improved.

*Keywords:* COVID-19, facial masks, function, expressive, aesthetic,

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## **Introduction**

### **Background and Need**

The Coronavirus (COVID-19) is a novel virus that has transformed the way of life around the world. The Center for Disease Control and Prevention (CDC) recommends that individuals, whether having had the virus or not, practice social distancing, at least 6 feet apart, wash hands regularly, and wear masks (CDC, 2020). The CDC has multiple suggestions for what makes an effective face mask. The CDC recommends masks with two or more layers, to ensure it covers the nose and mouth, washed regularly, tight fit, etc., and for all of these methods to be followed correctly for the masks to aid in stopping the spread (CDC, 2020). As a result of COVID-19, many states require face masks in public. The Governor of Arkansas mandated face masks/coverings in public on July 20, 2020.

While using a face mask in public is novel to most Americans, masks have been used throughout medical professions, specifically to protect health care workers from diseases. For instance, masks that covered the mouth and nose gained popularity specifically in 1910-1911 with the Manchurian plague, and the Influenza pandemic in 1918-1919 (Strasser & Schlich, 2020). In 1918-1919 masks were required to be worn by police, medics, and even some U.S. citizens (Strasser & Schlich, 2020). Despite the historical use of facemasks, the use of masks to combat the spread of COVID-19 has been met with controversy.

This study sought to evaluate participants' perceptions of wearing masks. This study applied the Functional, Expressive and Aesthetic Consumer Needs Model (FEA), created by Lamb J. M. and Kallal, M. J. (1992), to explore masks, assess consumer's perspectives, and gain knowledge on face masks during COVID-19 (Stokes & Black, 2012). The survey created was administered to faculty and students in the Bumpers College at the University of Arkansas.

Faculty and students were still adjusting to changes to in education during COVID-19, which included virtual/remote classes as well as face to face or hybrid classes when they had to adapt to wearing face masks for prolonged periods of time. The wider community of the University of Arkansas (faculty, students, staff, visitors, etc.) were all considered consumers of masks, and the FEA-guided study revealed the preferences and perceptions of mask-users considered under an apparel accessory lens.

### **Problem Statement**

COVID-19 posed a global threat, as it disrupted jobs, schooling, family gatherings, community gatherings, and travel. Normalcy was disrupted and phrases like “unprecedented” were widely used to describe 2020. As of September 20<sup>th</sup>, 2020, at 2:40 pm, (please note these reports to the CDC began on January 21<sup>st</sup>, 2020) there were 6,748,935 total cases in the U.S., 42,561 new cases, 198,754 total deaths and 655 new deaths (CDC, 2020). These numbers continued to increase throughout 2020, reaching new highs in November 2020. The widespread use of the face mask was intended to protect individuals from the virus and curb the spread of the virus. The CDC (2020) stated that contaminated respiratory droplets spread the disease, and that masks provided a barrier that reduced the number of these droplets released into the air. Despite the recommendations of the CDC, some people refused to wear a mask, citing a lack of belief in the recommendations of the CDC. Mask use is complex and requires proper wear, sanitization, lack of touch, and frequent wear especially when social distancing is not possible and/or indoors (CDC, 2020).

## **Purpose Statement**

The purpose of this study was to understand consumers' attitudes and user-experiences of facemasks during the COVID-19 pandemic. The study explored the purchasing preferences and challenges faced by mask users from functional, expressive, and aesthetic perspectives.

## **Research Questions**

1. What is the level of satisfaction consumers have with the existing face mask during the COVID-19 pandemic in terms of usage?
2. What are the challenges faced by face-mask users during the COVID-19 pandemic?
3. Does wearing a facemask affect one's social image/interaction?

## **Literature Review**

The research questions were essential to the exploration of the use of masks during the COVID-19 pandemic through an apparel lens. The survey questions were developed to evaluate each of the three constructs of functional, expressive, and aesthetic areas surrounding consumer perceptions of an apparel accessory.

This FEA model was developed by Lamb and Kallal (1992). The FEA model originated from encouraging students to create garments for people with special needs and it helped assess specific consumer needs by considering the functional, expressive, and aesthetic areas to create a successful garment (Lamb & Kallal, 1992). This FEA framework offered a problem-solving foundation for other studies on apparel items (Lamb & Kallal, 1992).

## **Functional Construct**

### **Effectiveness**

According to the Merriam-Webster dictionary, one of the definitions for the word function states, "the action for which a person or thing is specifically fitted or used, for which a



thing exists: purpose” (Merriam-Webster). The function of facemasks in context of this study depicts how well masks serve the intended purpose, in efforts to curb the spread of COVID-19 by trapping droplets inside the mask and ensuring any droplets in the air do not enter the mask. Numerous patterns were used in creating masks. Some were two layers of cloth, some were three layers of cloth, some were designed with a pocket for a coffee filter or other types of changeable filters. Mask diversity was important to evaluate because people were responsible for obtaining their own masks, and not all masks provided the same level of protection or have the same effectiveness in curbing the spread of the virus. Initially, there was a shortage of facemasks and people began to use household items to make their own masks (Chua et al., 2020). According to Science Direct, the number of layers utilized in making cloth masks affected the performance of the mask (Beesoon et al., 2020). Every textile used to make masks has different filtration and breathability traits. Overall, research suggested that fine fibers, tightly woven fabrics, fiber surfaces with electrostatic charges, and a hybrid composition resulted in a high filtration level, which decreased chances of the virus penetrating the mask (Beesoon et al., 2020). Combining different textiles (multiple layers), and preferably including a salt coated fibrous layer as one of the layers makes the mask more effective, however, there are not current regulations in place that specify construction criteria for masks in public settings (Beesoon et al., 2020). In conclusion, the intended function of the mask is lost when masks are utilized improperly or do not have the correct construction. Public health officials and others must enforce proper mask use and textile construction in order for the masks to be effective in preventing the spread of COVID-19.

### **Comfort**

With the mandated wearing of face masks while in public and indoors, comfort of the mask was an important construct to evaluate. A study conducted on 158 health care workers

during the COVID-19 pandemic, found 80% of the participants experienced a bilateral headache (Ong et al., 2020). During the 30-day period of mask use, headaches occurred one to four times a day, and within 30 minutes after removal of the face mask, the headache disappeared (Ong et al., 2020). With the prolonged use of the mask, the saliva and sweat buildup around the mouth caused redness, rashes, rosacea, acne, eczema, or even allergies (Chien, 2020). Face masks were also believed to restrict breathing (Howard, 2020). These studies indicated that mask wearing for prolonged times was an inconvenience and uncomfortable. This study sought to evaluate the degree to which the function and comfort of the masks impacted the purchase and use of masks.

### **Expressive Construct**

The term expressive relates to expression and means “effectively conveying a meaning or feeling” (Merriam- Webster). Within the FEA model, the expressive construct aimed to look at the impact of masks on expressive qualities like feelings, moods, facial expressions and even self-esteem. However, oftentimes mask perceptions were complex, and people typically understood both sides (Howard, 2020). When attempting to understand people’s perceptions of masks, these multiplex opinions made it hard to only accept one side. As a result of this, the researcher gained insight and reviewed literature pieces that supported both sides to make conclusions about the expressive perceptions of COVID masks. The researcher acknowledged the abundance of data that was unreported and recognized that many people’s perceptions went undocumented. Additionally, within this model, the expressive construct looks at values, roles, status, and self-esteem. This perspective of consumer’s self-image with masks was also revealed later in this section. This expressive section reviewed reported data from both positive and negative mask perceptions from credible sources to gain a better understanding of consumer needs. It also depicted consumer’s self-esteem regarding masks and looked at potential coping mechanisms to the burdens of masks.

### **Positive Perceptions Reported**

This section reviewed expressive literature pieces that reported a positive public perception to the mask. First, it is important to remember that when masks are correctly worn, they are effective against the spread of COVID-19 (CDC, 2020). Additionally, asymptomatic people can still infect others (CDC, 2020). A recent study found that mask users view other mask users more positively, and that empathetic people were more likely to wear masks (Betsch et al., 2020). Interestingly, the percentage of participants in this study who wore masks often or always was larger than the group that did not (Betsch et al., 2020). Mask users in this study-imposed judgement on the non-mask users and the results from the data demonstrated that wearing masks was a social contract wherein compliant people perceive each other more positively, and noncompliance was socially punished, largely by judgement (Betsch et al., 2020). A study that specifically surveyed U.S. consumers found that most consumers reported a more likelihood to wear the mask if it was a requirement (Knotek et al., 2020). These studies indicated a particular respect for mask regulations, which demonstrated that masks were well received by the public. Another study concluded that wearing facemasks protected both physical and mental health because mask users in the study had fewer physical symptoms of the virus along with lower levels of anxiety, depression, and stress (Wang et al., 2020).

### **Negative perceptions reported**

This section reviewed literature focused on negative perceptions of the expressive construct of masks. One study found that people who were not compliant with wearing masks in public appeared to be “socially punished” and were judged by mask wearers (Betsch et al., 2020, para. 4). On this same note that touches on social acceptance, the same study also found that more people reported being unwilling to wear a mask when the option was voluntary, but when

mask wearing was mandatory the mask use increased (Betsch et al., 2020). In terms of facial expression, face masks impair face recognition and face identification, verbal and non-verbal communication, and block emotional signaling (Spitzer, 2020). People communicate through facial expression and since mask-wearing became the norm during COVID-19, this covering affected social interaction and reduced the ability to perceive emotion (Nestor & Arnold, 2020). One study mentioned that hiding the lower part of the face impaired our “positive social interactions and our ability to understand and empathize with one another” (Spitzer, 2020, Section six, para. 5). Spitzer also reported that wearing masks in a school setting was burdensome. Spitz (2020) discussed the importance of emotions and group cohesion- and stated that masks interfere with the student teacher relationship as well as student to student communication, since features of faces were restricted.

### **Self Esteem**

This construct largely involved COVID-19 masks role with consumer’s self-esteem. In a poll conducted by Vision Direct, 1 in 3 Americans felt self-conscious about wearing the COVID face mask in public (Vision Direct, 2020). This regarded fears on looking unattractive, silly, and some practical concerns with glasses fog and lack of comfortability with the mask (Vision Direct, 2020). Mind for better mental health, a charity organization that discusses coping with COVID-19, states some challenges masks pose regarding self-esteem, mentioning that the covering alters the way individuals look which may cause negative feelings around identity or body image (Mind for better mental health, 2020). This self-conscious perspective of masks was further highlighted with other examples of challenges with masks including masks presented a visual reminder of COVID-19 which may cause inability to relax and uneasy behavior, anxiety about being judged or stigmatized in public if an individual was exempt from wearing a mask,

and anxious or upset emotions when others are not wearing a mask in public (Mind for better mental health, 2020). Additionally, people felt a lack of confidence when continually wearing masks, some reasons including face coverings lead to individuals or others feeling dehumanized or scared, glasses steaming up due to wearing masks caused an overwhelmed and uncomfortable emotion, and a panicked and unconfident attitude towards masks due to feeling claustrophobic, sick, or overwhelmed by thoughts (Mind for better mental health, 2020). This section reviewed COVID masks from a self-conscious and self-esteem perspective which was essential to understand in the expressive construct of the FEA model.

### **Coping Mechanisms**

Several coping mechanisms have been published. One solution to the anxiety and self-esteem issues caused by masks was linked with one of the most valued aesthetic procedures, Botulinum Toxin (BTX) injections (Nestor & Arnold, 2020). In this study, BTX was discussed as an alleviator to negative emotions that may be caused by masks during COVID-19. Receiving Botulinum Toxin injections was posed as a solution to the anxiety and depression that was linked with COVID-19 and wearing masks, as BTX showed effectiveness in treating depressive disorders (Nestor & Arnold, 2020). Another study acknowledged the burden of masks associated with reduced expression in people's verbal and non-verbal communication clues (Genç et al., 2020). This study tested whether masks could imitate expression to potentially increase the number of mask users in public (Genç et al., 2020). There were two prototypes created: "Mouthy Mask" (imitated the wearer's mouth only) and the "Smiley Mask" (similar to an emoji, drawn out face). The study recruited individuals who reported whether the masks were acceptable for different social occasions/people including strangers, colleges, family, friends, public transportation, sidewalks, restaurants, and more (Genç et al., 2020). The results supported that

the “Mouthy Mask” brought a positive response in social interactions but only for short periods of time and was not a preferred method with family and friends. The “Smiley Mask” was not as successful or complementary because it contributed to distraction while in conversation (Genç et al., 2020). These sections all under the expressive construct of the FEA model discussed consumer’s expressive perceptions with COVID-19 masks.

### **Aesthetics Construct**

In continuing the research on COVID masks utilizing the FEA model, this section focused on the aesthetics of masks. Merriam Webster (2020) defines aesthetic in relating to appearance and beauty. Masks have become the new normal, and some consider them an accessory. Masks cover a large portion of the face when worn correctly, and as a result of this, it was important to acknowledge the creative and visual side to face masks.

### **Appearance**

Howard (2020) explored the appearance of masks and developed the Face Mask Perceptions Scale, which noted the four most common perceptions of the studies participants: face masks look dumb, face masks look silly, face masks are ugly, and face masks look weird. Additionally, in a qualitative reasoning result chart with other categories of popular perceptions, 16% of the respondents said the reason they do not wear face masks was because “facemasks have an undesirable appearance” while 19% of participants estimated that this was the reason for why others do not wear facemasks (Howard, 2020, Section one, Table one). This study supported the idea that people cared about mask aesthetics and appearance, and proposed that if this negative perception continued, that it may lead to an increase in non-mask users (Howard, 2020). Another source investigated the perception of face masks and how to still emulate beauty while wearing a mask including: knowing what colors highlight uncovered features of the face (mostly

hair and eye color), and experimenting with aesthetically pleasing masks with colors, patterns, and unique designs (Ward, 2020). Similarly, further research also noted COVID-19 inspired creativity with masks (Judkis, 2020). Masks changed the way people perceive others and themselves. Since appearances were partially hidden with the masks on, self-expression was restricted. Fashion companies adapted to this limitation and prioritized instilling confidence. As an example, makeup companies promoted the bolder eye makeup trend and fashion brands created their own aesthetically pleasing fashion masks (Judkis, 2020).

### **Adaptation in Fashion**

Manufacturers made a wide range of aesthetically pleasing masks for different target audiences. Specifically, Walmart's online selection of masks had 1000+ products and included surgical face masks, cloth face masks, neck gaiters & balaclavas, bandanas, and face shields (Face Coverings Masks). This wide selection of masks increased the chances of people finding a mask that worked for them and encouraged people to abide by the requirement of masks in most places. Masks are known as the new "must have" accessory and norm in western cultures but have been in Tokyo for years (Wetherille, 2020). Masks will soon be mainstream fashion, as designers have already branded and created their own lines of masks (Wetherille, 2020). Interestingly, Tokyo residents did not only wear the mask for COVID-19 purposes but wore them for casual reasons: covering a pimple, lack of makeup, self-expression, and for fashion. As masks were normalized in Tokyo long ago, this transition suggested how the U.S. may utilize masks in the future. In 1918 when the Spanish Flu was rampant, a similar change was made as women were wearing veils (Wetherille, 2020). The style of the veil had been popular during the Victorian era but had to come back after a suggestion from health officials to keep people safe,

much like the current face masks. The adaptation of the fashion industry was influenced by public attention on the appearance of face masks.

This literature review found scholarly research under the FEA model and the early research on face masks and COVID-19. However, research has not been conducted to gauge consumer perceptions of face masks using the FEA model.

### **Methodology**

This methodology section discusses the research design, population and sampling, instrumentation, data collection, and then data analysis. The following presented a detailed outline for how the study was organized and why.

#### **Research Design**

This study was conducted using a non-experimental, descriptive, quantitative research design using a consumer survey. The basis for the survey was the FEA Consumer Needs Model, which provided a conceptual framework and facilitated research typically in the evolutionary phases of apparel garments (Ordaza et al., 2016). This FEA framework created an outline for this descriptive research, as the model originated by helping assess specific consumer needs for people with special needs (Lamb & Kallal, 1992). The survey approach was essential to the research because in terms of a non-experimental quantitative design, surveys were an important tool in understanding perceptions (Cook et al., 2008). Additionally, descriptive and quantitative research methods aligned by utilizing a non-experimental survey to gather information “to be used for statistical analysis of the population sample” (FormplusC, 2020, Quantitativeness Section, para.1). The study needed a quantitative survey design to collect data in efforts to understand student perceptions of face masks during the current pandemic because survey research “uses a selected portion of the population from which the findings can later be generalized back to the population” (Glasow, 2005, p. 5).



### **Sampling and Demographics**

This research topic addressed the theoretical population of the University of Arkansas but within the accessible population of Bumpers College students. The study used a convenient sampling method and a total of 211 students participated in this study. Out of the 211, 189 students were female, 20 were male and 2 were non-binary. The age distribution of the participants was as follows, 203 students in the age range of 18-24, 5 students in the age range of 25-34 and 1 student in each age range of 35-44, 45-54 and 55-64. Also, out of the 211 participants, majority of them are White (183 students). The remaining participants belongs to different ethnicity as follows, 9 African American, 5 Asian, 3 American Indian, 2 Native Hawaiian and 9 others.

### **Instrumentation**

This section addresses the development, and administration of the survey. A survey questionnaire was used to collect data regarding the perception and user's experience of facemasks. The survey was developed following the constructs of the FEA model that align with the research objectives of the study (Orzada & Kallal, 2019). The survey contains a total of 26 close-ended questions with a five-point scale for each question. Additionally, the survey allowed participants the option to answer demographical questions regarding gender, age, and ethnicity.

### **Data Collection and Analysis**

The data was collected through Qualtrics. Upon approval from the IRB, the online survey was deployed to the Bumper's College students. The survey had an online consent and instructions at the beginning to facilitate the participants. The collected data was statistically analyzed using SPSS 26 and the results were reported in the report section.

## Results and Discussion

This section analyzes the data above taken from the unique FEA survey in terms of COVID masks. One purpose of this study was to look at COVID masks in terms of function. This section explores how University of Arkansas students feel about the COVID masks they wear frequently in terms of functionality. 34.6% of students felt that face masks were somewhat uncomfortable to wear, while 7.1% felt they were very uncomfortable. This largely indicates that students do not think the masks are comfortable. 34.1% of students felt it was neither easy nor difficult to don and doff their face mask, while 6.6% of students felt it was extremely difficult. The data found suggested that 32.7% of students were satisfied with the fit of the face mask while wearing it. To contrast, 7.6% of students were extremely dissatisfied, suggesting that face masks function relatively well in terms of fit while wearing it. Most students at the University of Arkansas somewhat agree that the fit of the face mask affects the purpose of wearing the face mask, while only 4.3% strongly disagree. In the aspects of washing and drying, 36.5% of students said it was extremely easy while 5.2% stated it was extremely difficult. When it comes to how often students are able to find the right-sized mask, majority (40.8%) stated that they were to find it almost every time. To contrast, only 2.4% of U of A students stated they were never able to find the right-sized face mask. In terms of speaking, 49.3% of students felt to was somewhat difficult to speak while wearing the face mask; while only 4.3% of students said it was extremely easy. This suggests that most University of Arkansas students have trouble with speaking with the face mask on. 41.2% of students said that they occasionally/sometimes felt difficulty in breathing while wearing a face mask while 3.8% of students have never felt difficulty in breathing. A majority of 37.9% of students were somewhat satisfied with the coverage provided by the face mask, which suggests a level of high functionality with COVID

masks. Interestingly, 29.9% of students occasionally/sometimes experience skin irritation due to wearing a face mask, while only 9.0% stated that they never have. 44.5% of students have experienced fog in their glasses every single time while wearing a face mask. This indicates a functionality issue for students who wear glasses. 47.9% of students felt it was somewhat difficult to hear someone when the speaker wears a face mask while 9.0% stated that it was somewhat easy to hear. Overall, students believe masks function relatively well at the University of Arkansas. Students would largely agree at most points in the survey when asked questions in terms of functionality, but there were some interesting opposing opinions that have been taken into consideration.

Another purpose of this study was to examine how U of A students feel about COVID masks in terms of expressive needs. 32.2% of University of Arkansas students were somewhat satisfied with the quality of their face mask while 3.3% were extremely dissatisfied. 36.5% of students were neutral when it came to asking if wearing a face mask facilitates their quality of life during this pandemic, while both 13.3% stated that it was somewhat untrue of what they believe or very untrue of what they believe. This paradox was interesting in terms of data analysis and showed a striking contrast in student beliefs. When it came to feeling pain/irritability on student's ear lobe area due to the face mask strap, majority of students (47.9%) said that it occurred occasionally/sometimes while only 8.1% of students answered never. 36.5% of students said they occasionally/sometimes feel better about themselves when they wear a face mask, while only 10.0% said they felt better every time. This indicates a positive expression involved with masks for U of A students. In terms of difficulty in understanding nonverbal communication while wearing a face mask, 28.9% said they experience difficulty almost every time while only 5.7% said never. 39.3% felt it was very untrue of what they believe when asked if not showing their face

completely limits expressions, while 30.3% felt it was somewhat true of what they believe. This was an interesting paradox and almost completely opposite. 29.9% of students were neutral when asked if not showing their face affects their body image while only 11.4% said that this was very untrue of what they believe. This suggests that U of A students do not believe COVID masks and body image relate. The last question of the survey asked if students believed that wearing a face mask makes you seen as a socially responsible person, and 35.1% of students stated that it was very untrue of what they believe, while 24.6% stated that it was somewhat true of what they believe. This expressive section analyzed and interpreted data drawn from the FEA survey. While the students would have a majority and popular response, oftentimes, U of A students had opposing answers when asked about their expressive needs and emotions regarding masks, indicating opposing belief systems amongst U of A students.

Lastly, the study looked at COVID masks in terms of aesthetics. In terms of fashion, 33.6% of students felt they were neither satisfied nor dissatisfied with their face mask. To contrast, 8.5% said that they were extremely satisfied with the fashion aspect of their mask. 21.8% of students said they were extremely dissatisfied with their mask in terms of style while only 8.5% said they were extremely satisfied. In terms of color, 32.7% of students said they were neither satisfied nor dissatisfied while 7.6% said they were extremely dissatisfied. In terms of price, 31.8% were neither satisfied nor dissatisfied while 6.2% were extremely dissatisfied. In terms of size, 31.3% of students were neither satisfied nor dissatisfied while 3.3% were extremely dissatisfied. Overall, many students felt neither satisfied nor dissatisfied with their mask when thinking in terms of aesthetics.

## **Conclusion and Implications**

COVID-19 pandemic had a huge global impact and wearing a face mask is one of the primary preventive measures. The WHO and CDC have recommended wearing a facemask whenever possible to reduce the spread of the virus. Though the mask is not a new piece of equipment in the health care domain, public use of face masks every day is a new paradigm. Medical-grade masks such as N95 have been in practice for several years among health care professionals. However, acceptance and usage of face masks by the general public needs to be understood. Hence, this study explored the user experience of cloth face masks with college students as the sample population. This pilot study results showed that most students expressed positive remarks and support for using face masks. In terms of functionality, the majority of the users are satisfied; however, concerns like fogging, pain in the ear lobes, and sizing need to be addressed to increase the rate of mask adherence. Also, in terms of expressiveness, the mask does not compromise their body image and their values. Though the non-verbal communication ability was affected, the expressiveness of one's self was not affected by the mask. Finally, aesthetics is the part where the majority of the students expressed dissatisfaction. To increase user acceptance, the style, fashion, and color of the mask need to be improved. This study understands the attitudes of the college students towards using a mask and documents the concerns expressed by the student-users in terms of functionality, expressiveness, and aesthetics. Overall, the aesthetics component needs more attention, and the manufacturer should address it to increase the rate of mask usage.

## **Limitations and Future Recommendation**

The primary limitation of this study is the sample population. The participants in this study were college students, and hence, the results do not generalize for other populations.

Future studies should include different categories of genders and age groups. User opinions on new mask designs with different styles and colors need to be studied. Also, the concerns identified in this study need to be resolved. The designer and manufacturer should consider using various types of textile materials for mask production.

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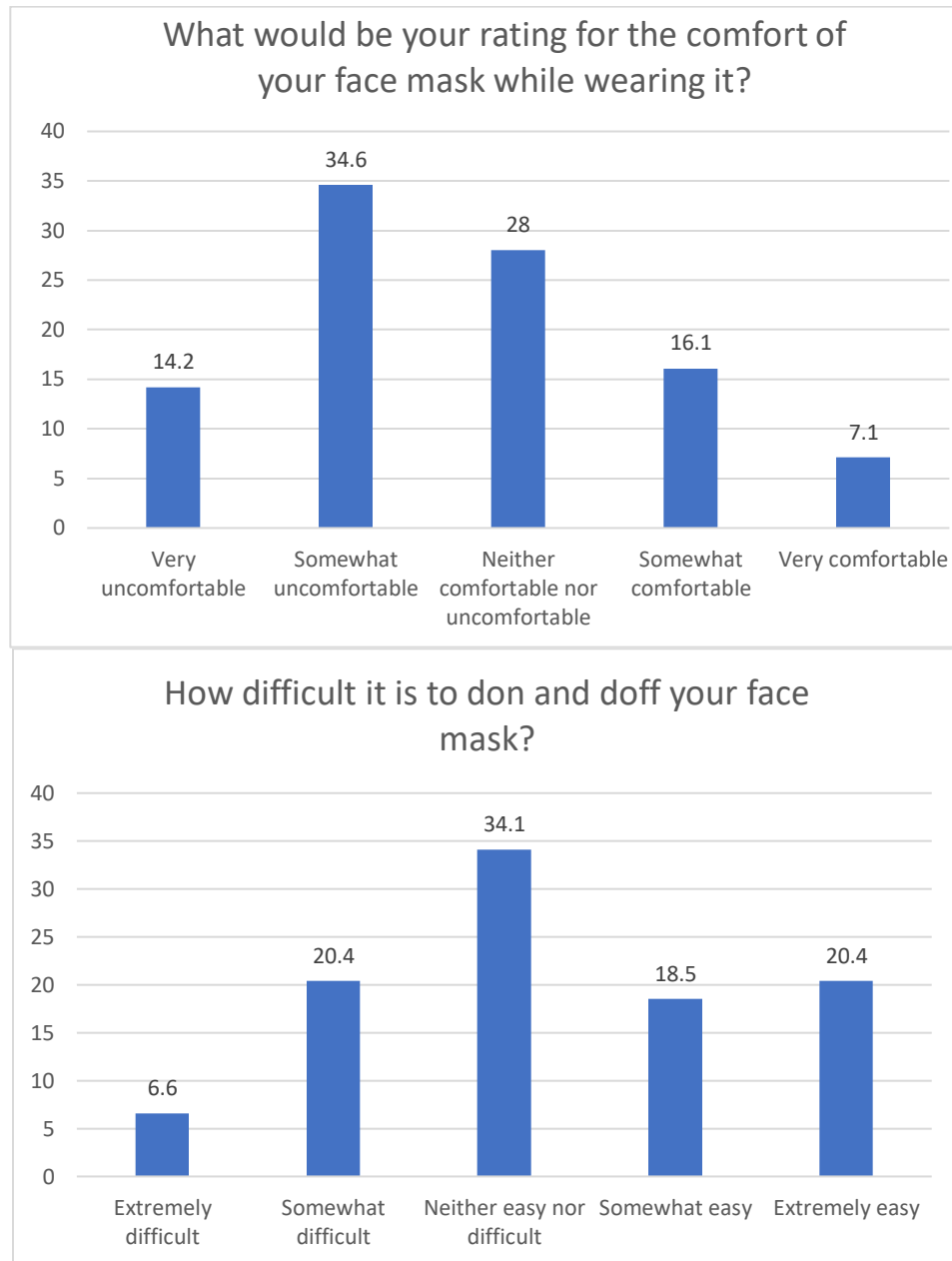
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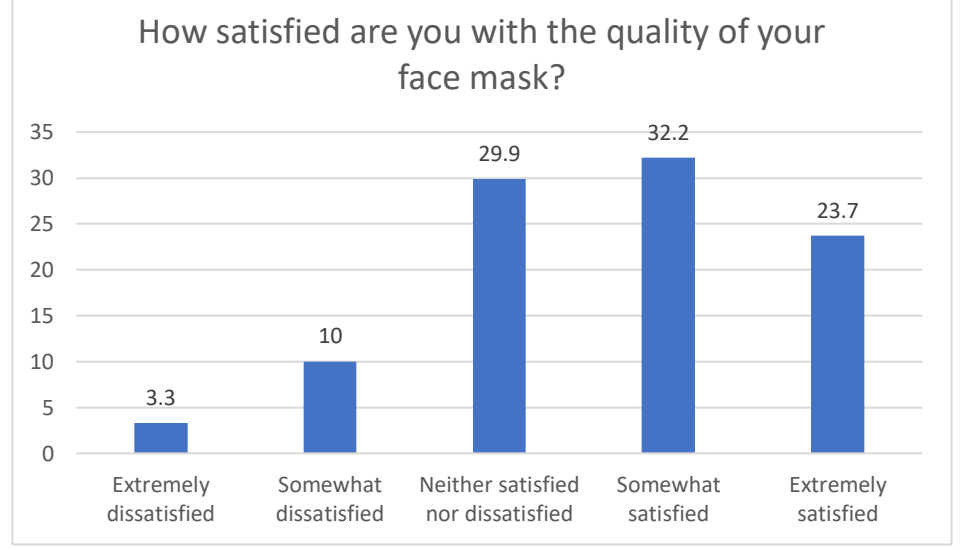
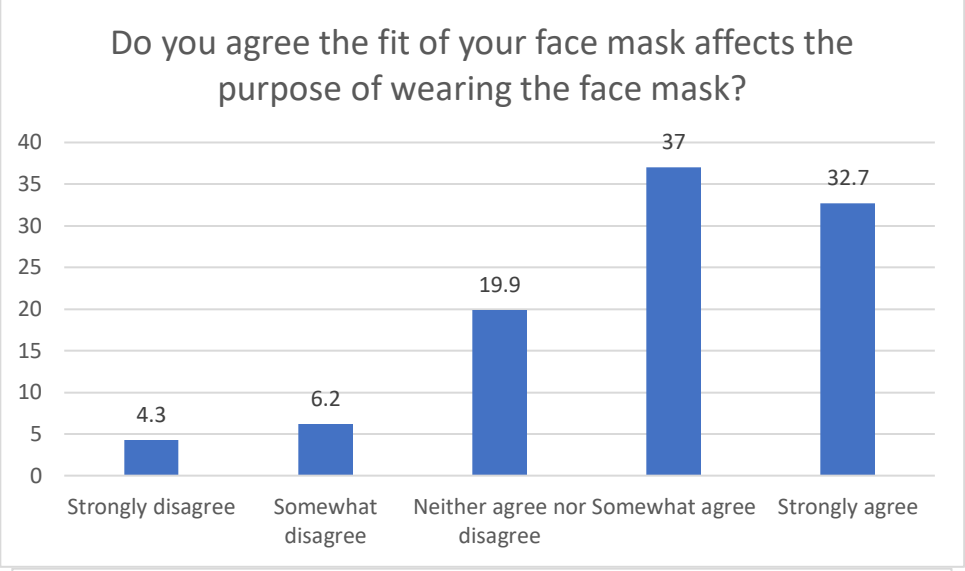
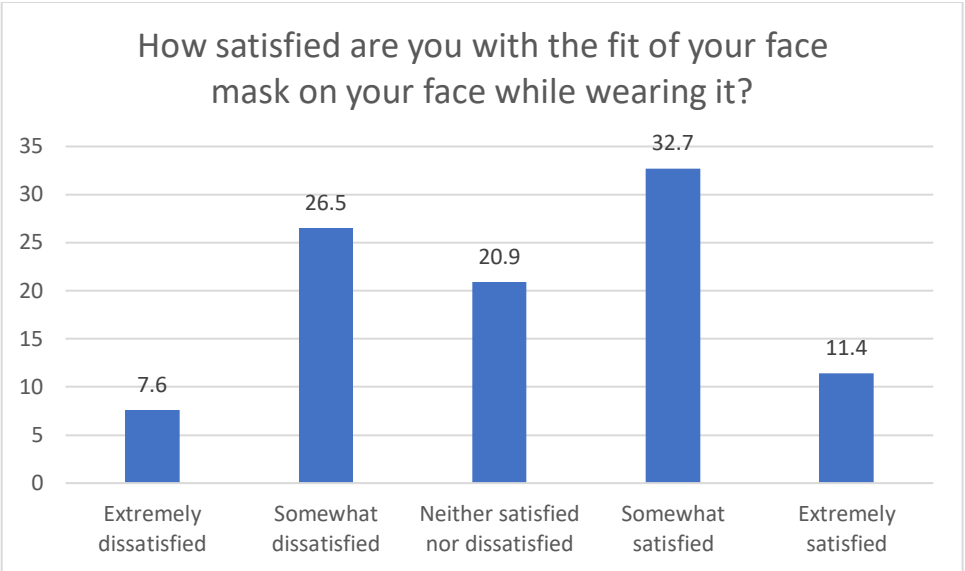
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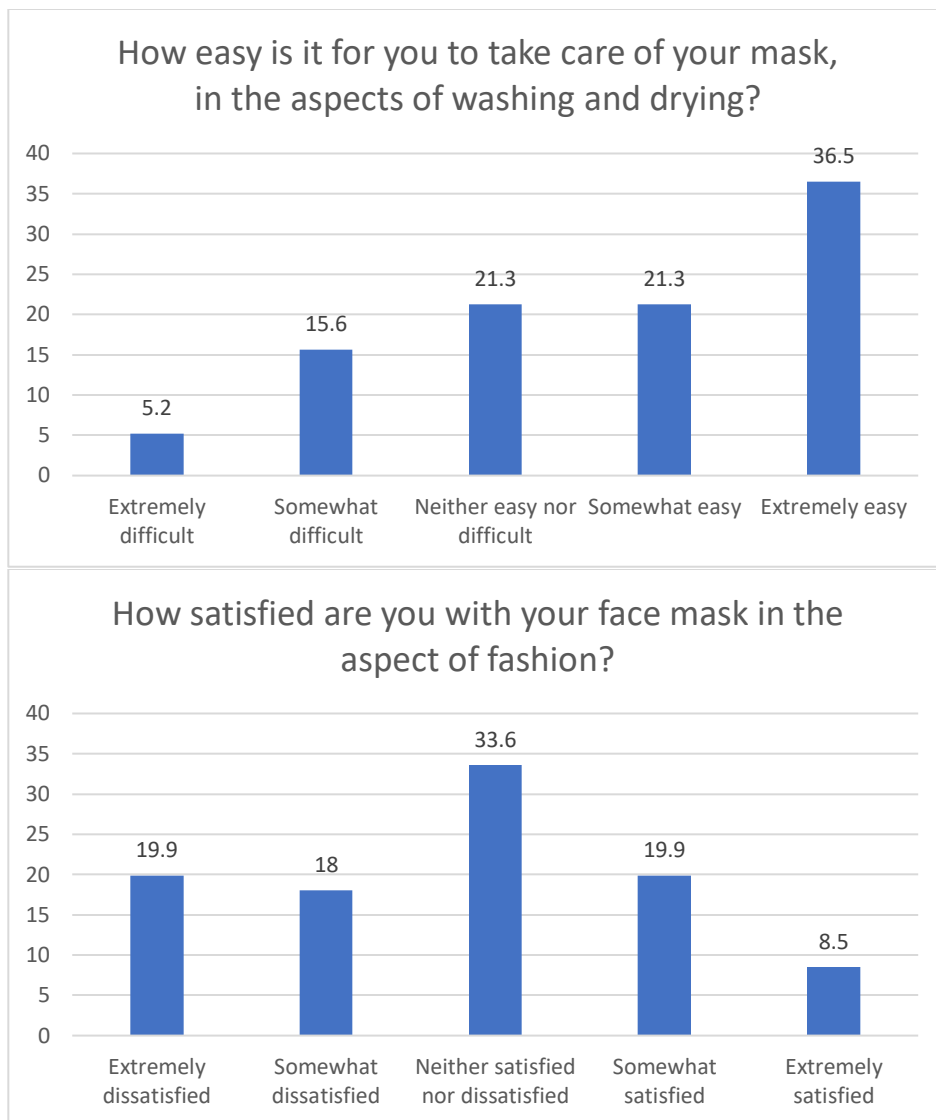
## **Appendix**

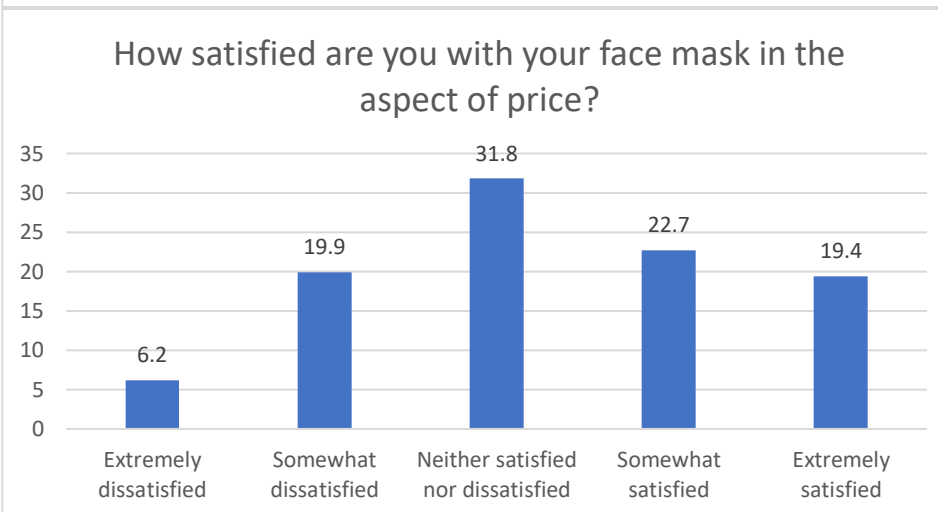
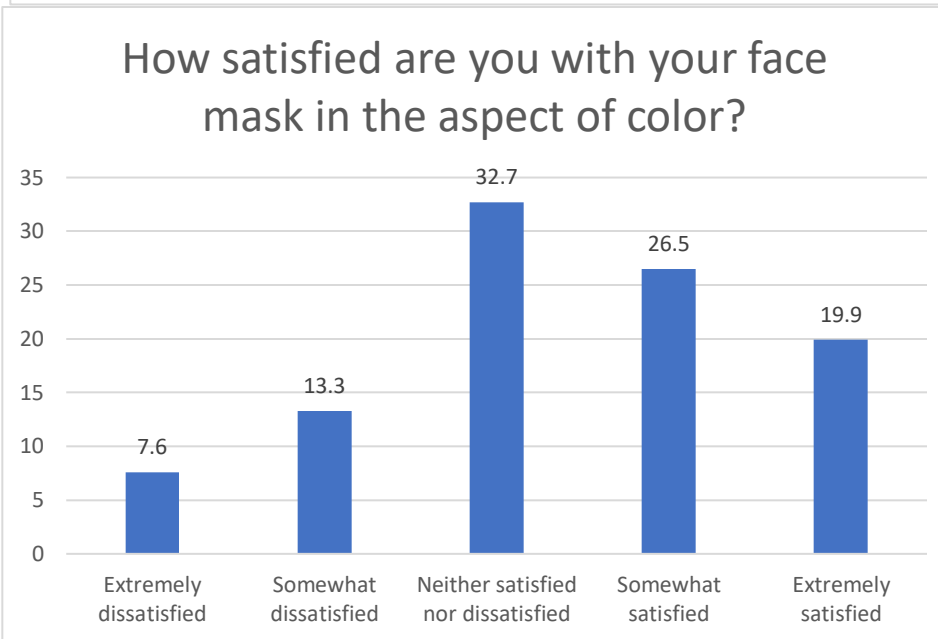
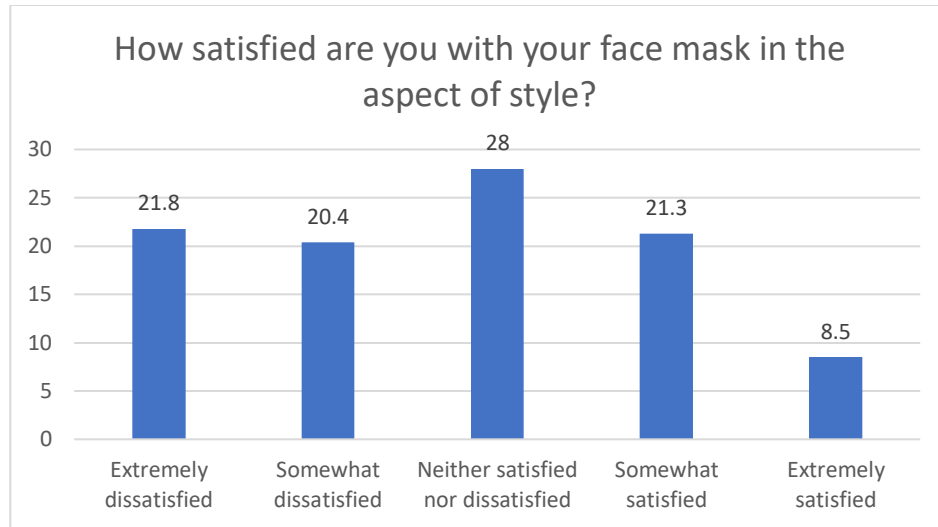
### **Appendix A**

### Survey results in graphical representation

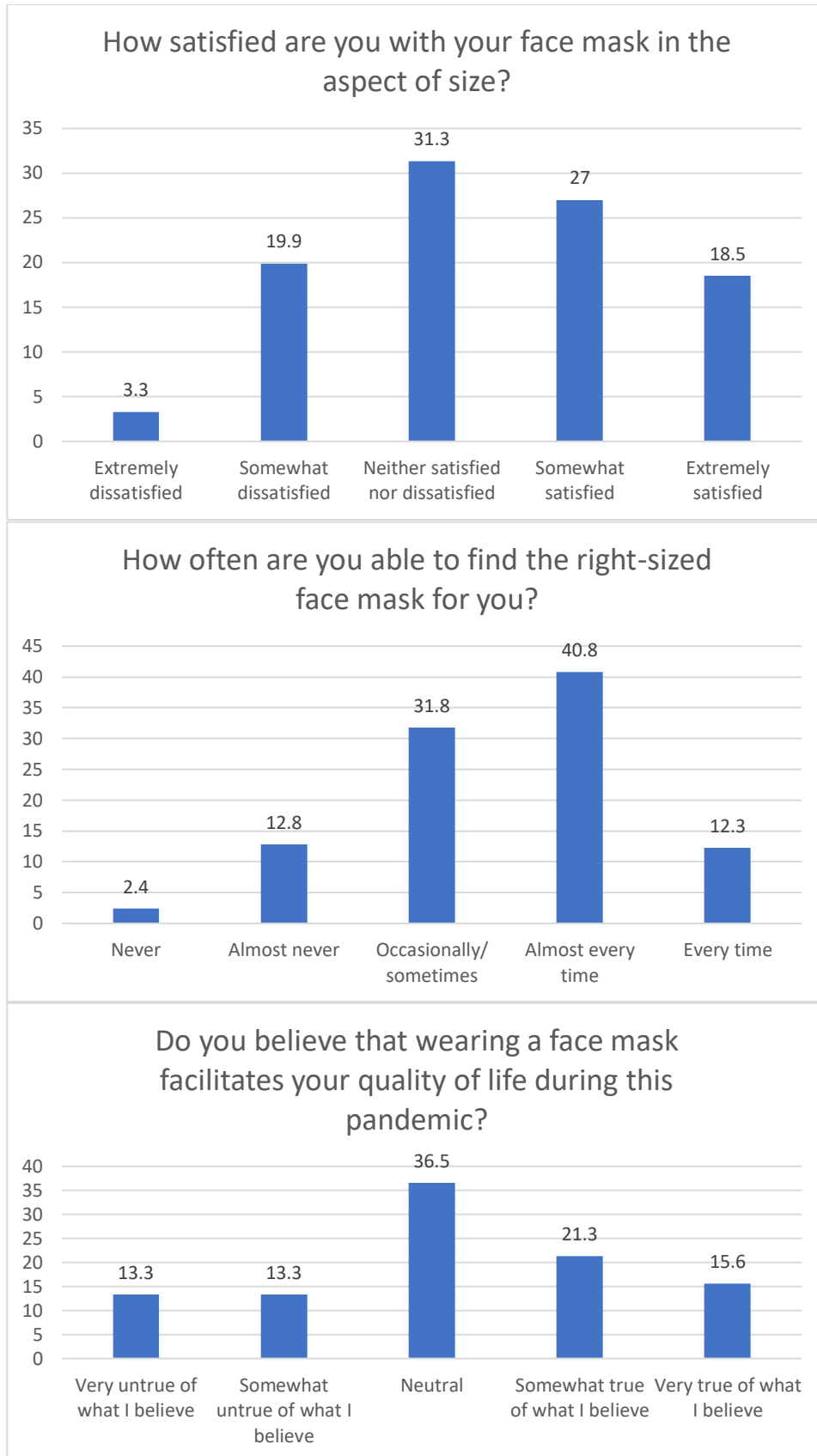


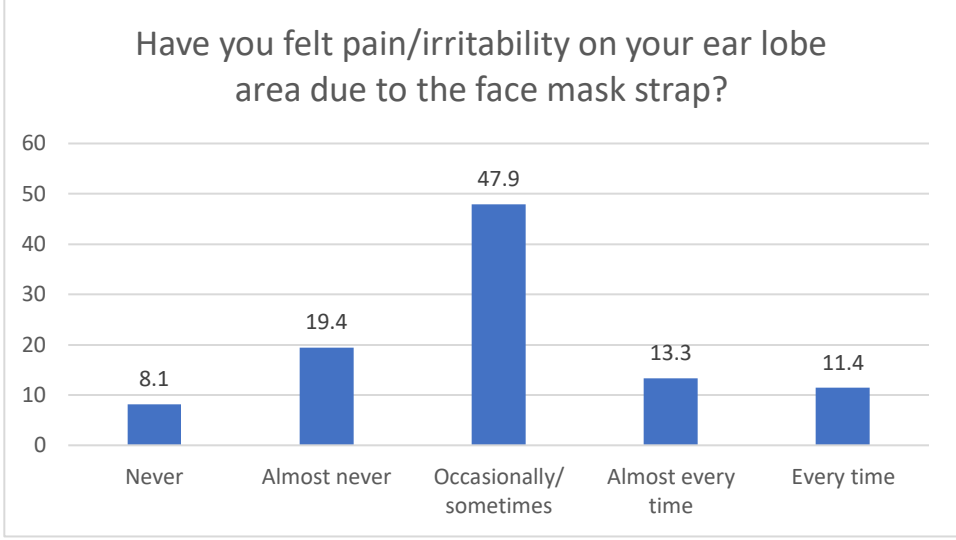
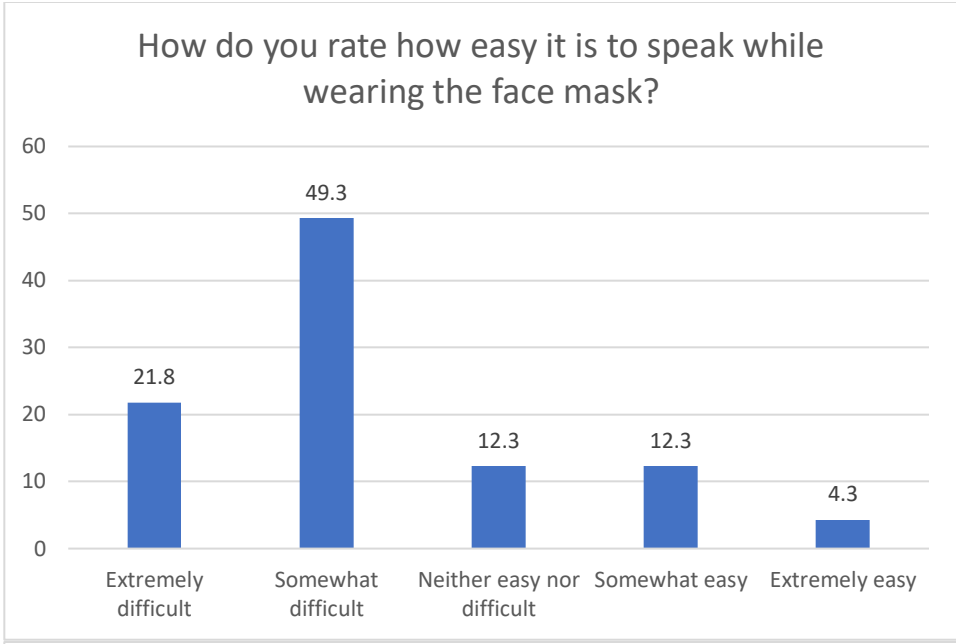




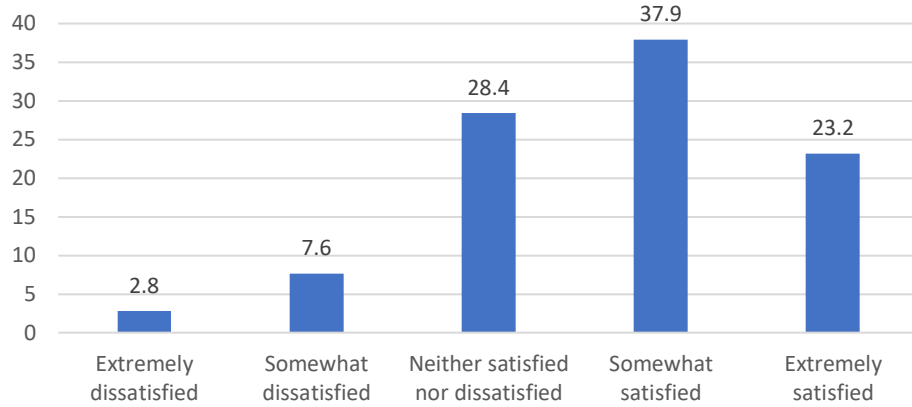




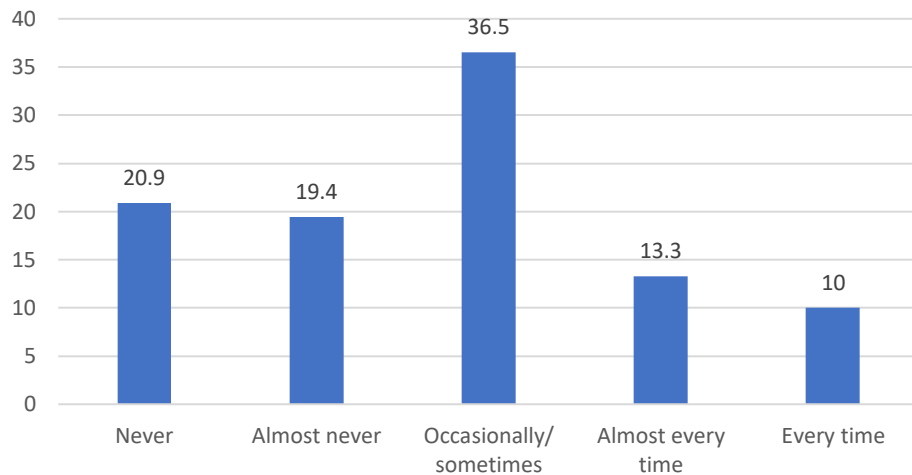




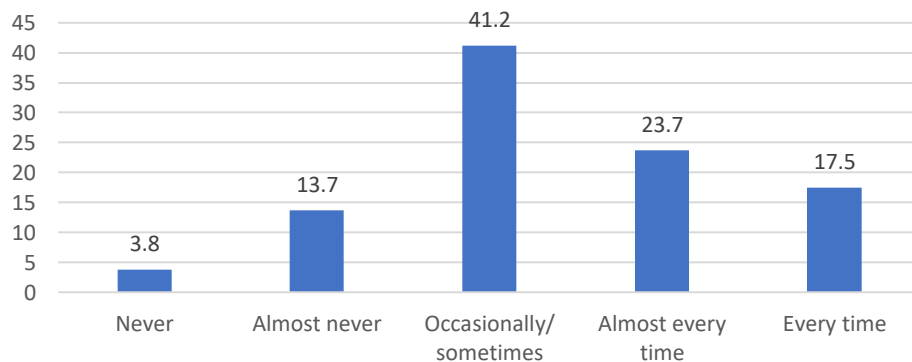
### How satisfied are you with the coverage provided by your face mask?

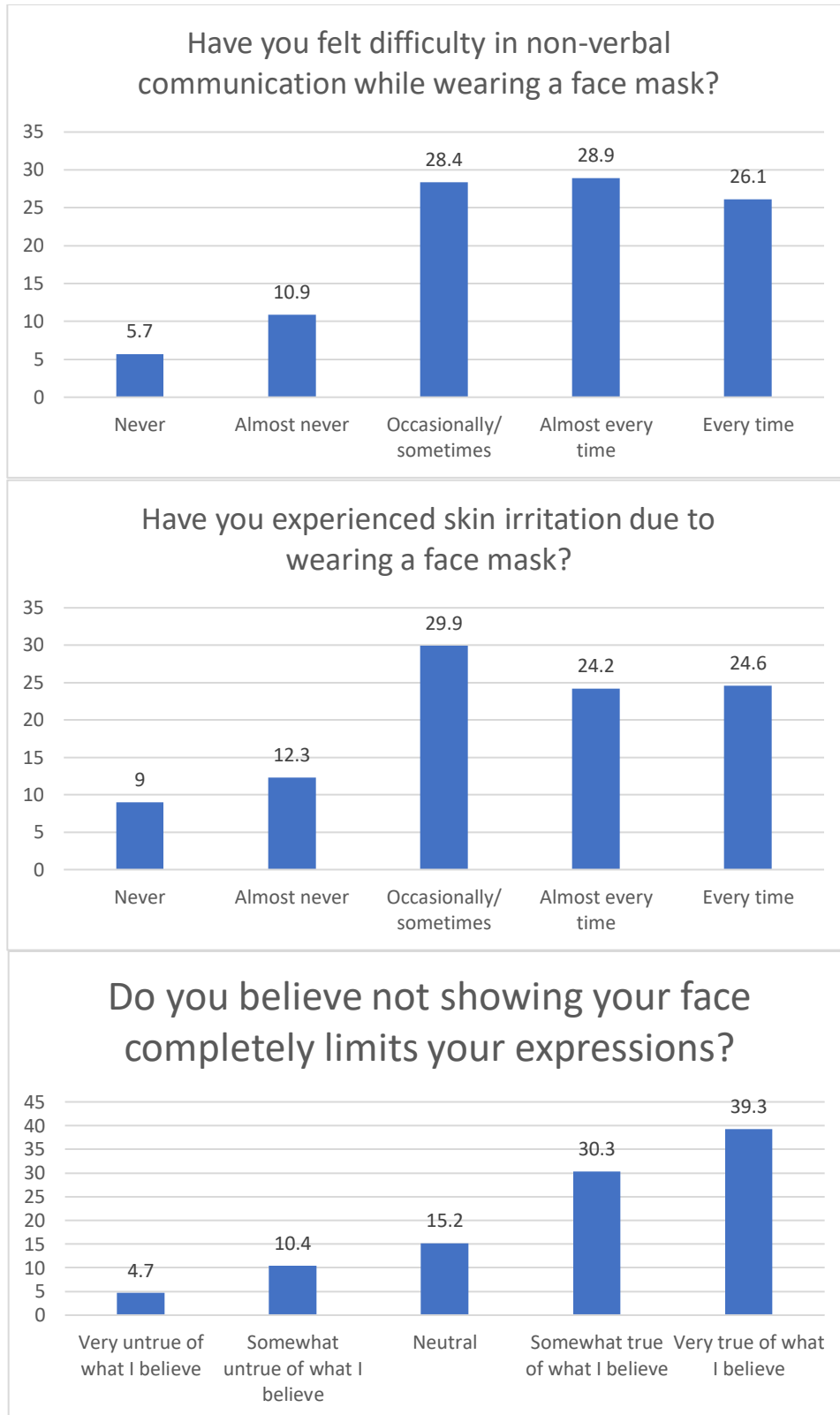


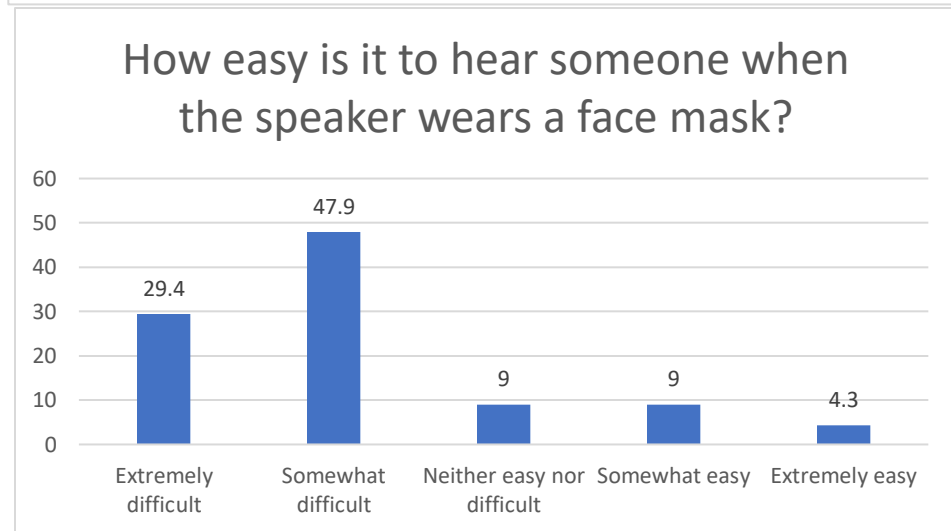
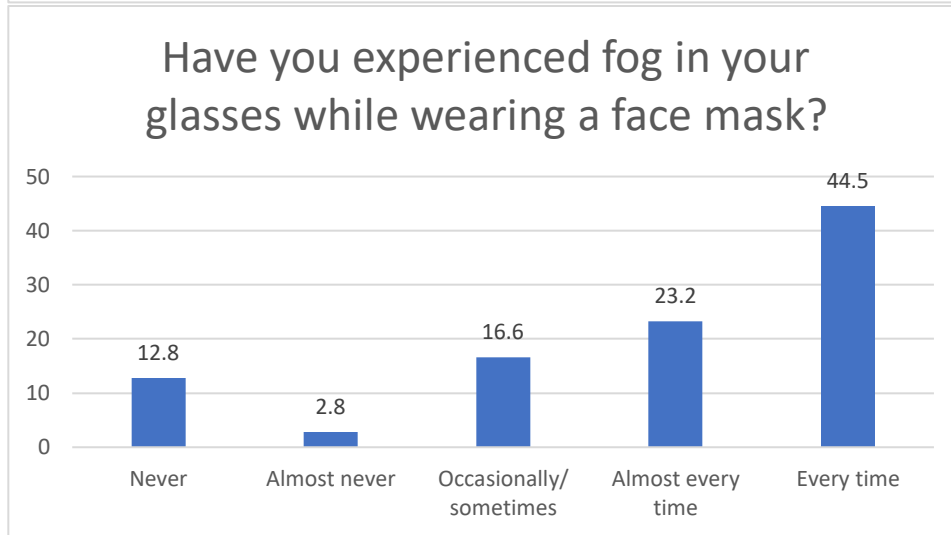
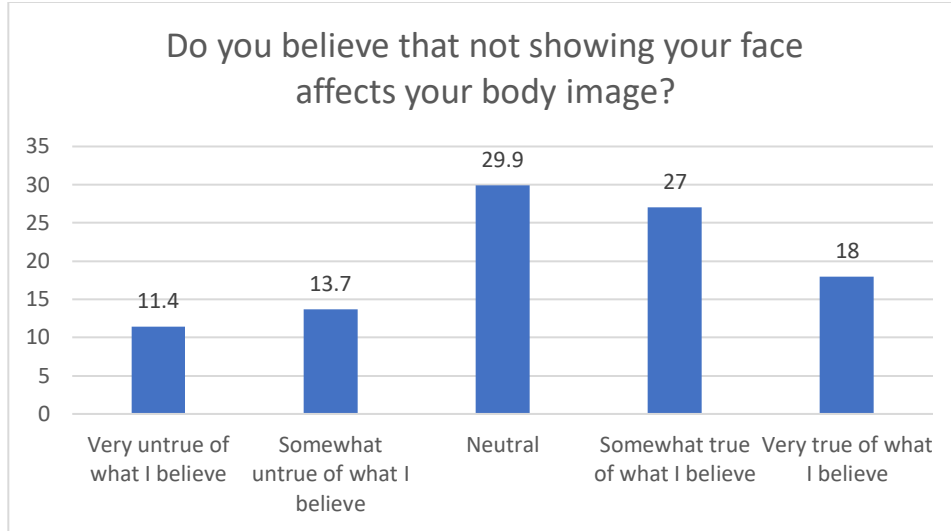
### Do you feel better about yourself when you wear a face mask?

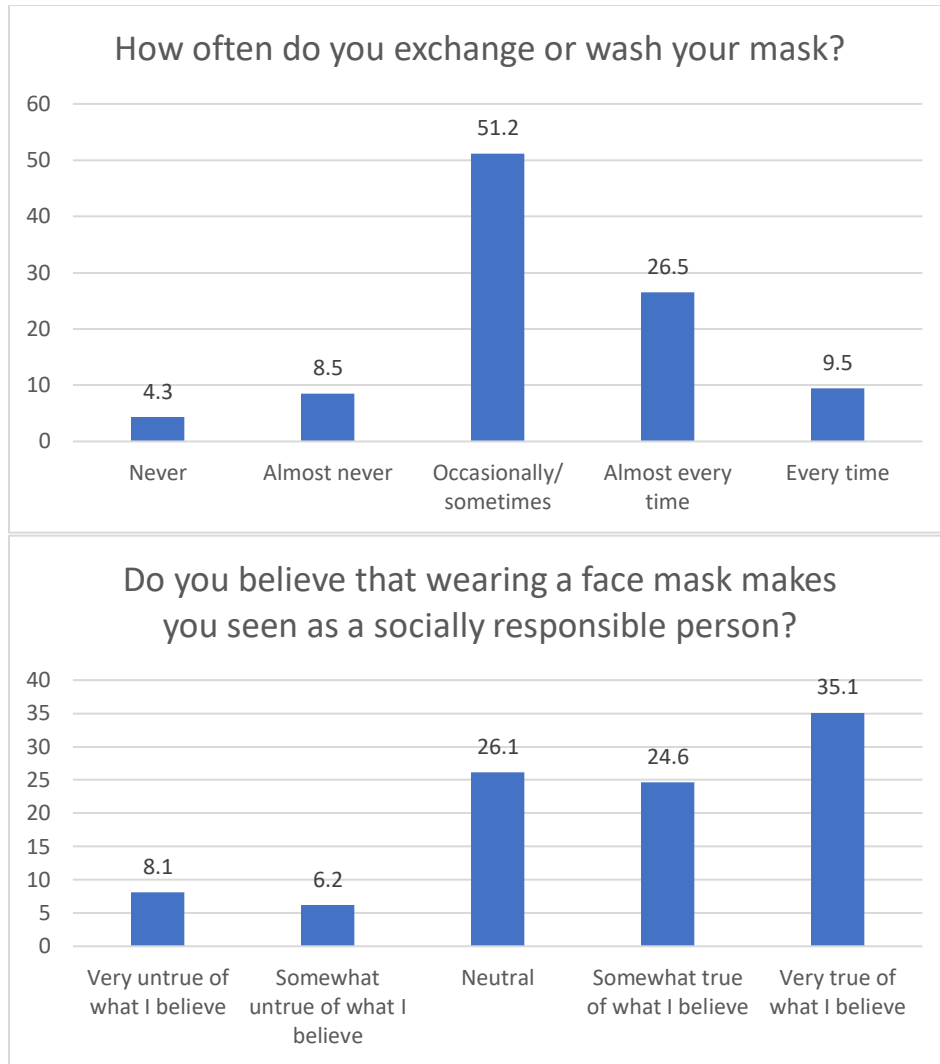


### Have you felt difficulty in breathing while wearing a face mask?



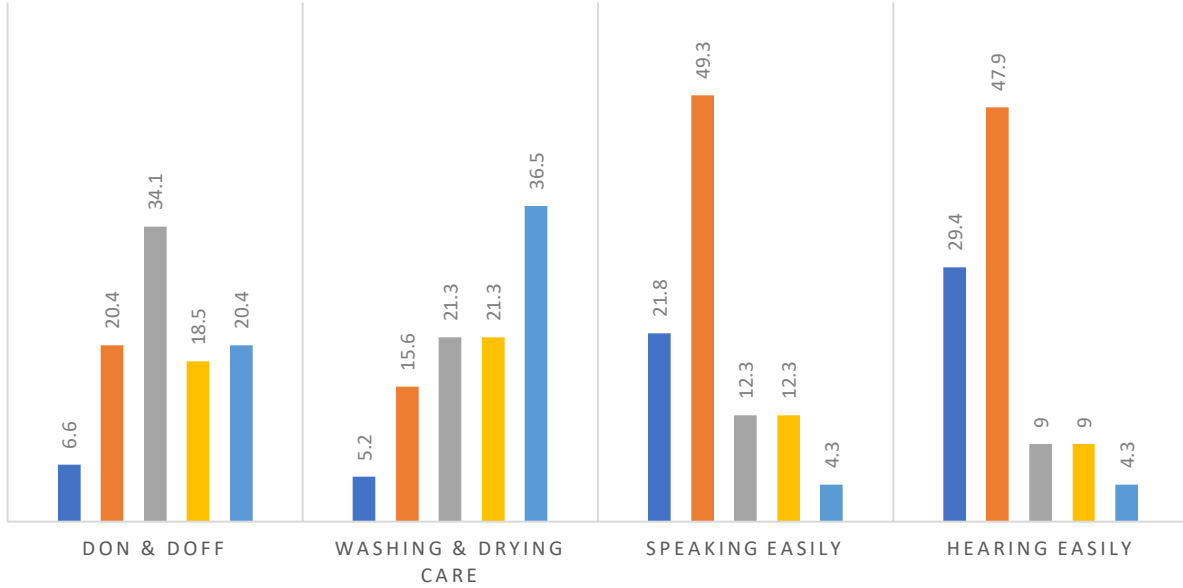






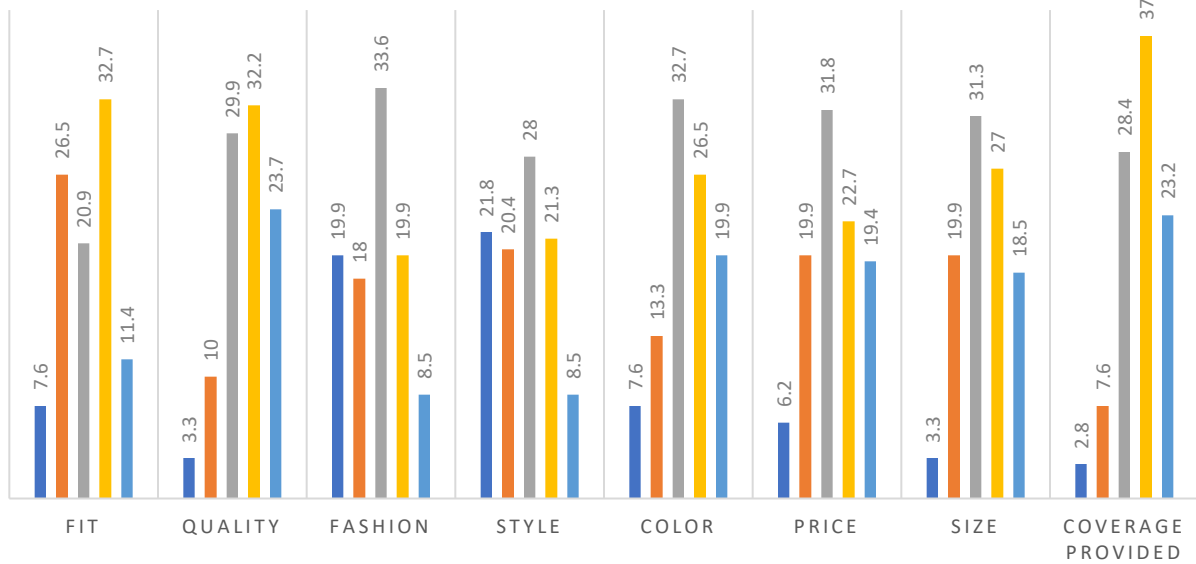
### LEVEL OF DIFFICULTY

Extremely difficult   Somewhat difficult   Neither easy nor difficult   Somewhat easy   Extremely easy

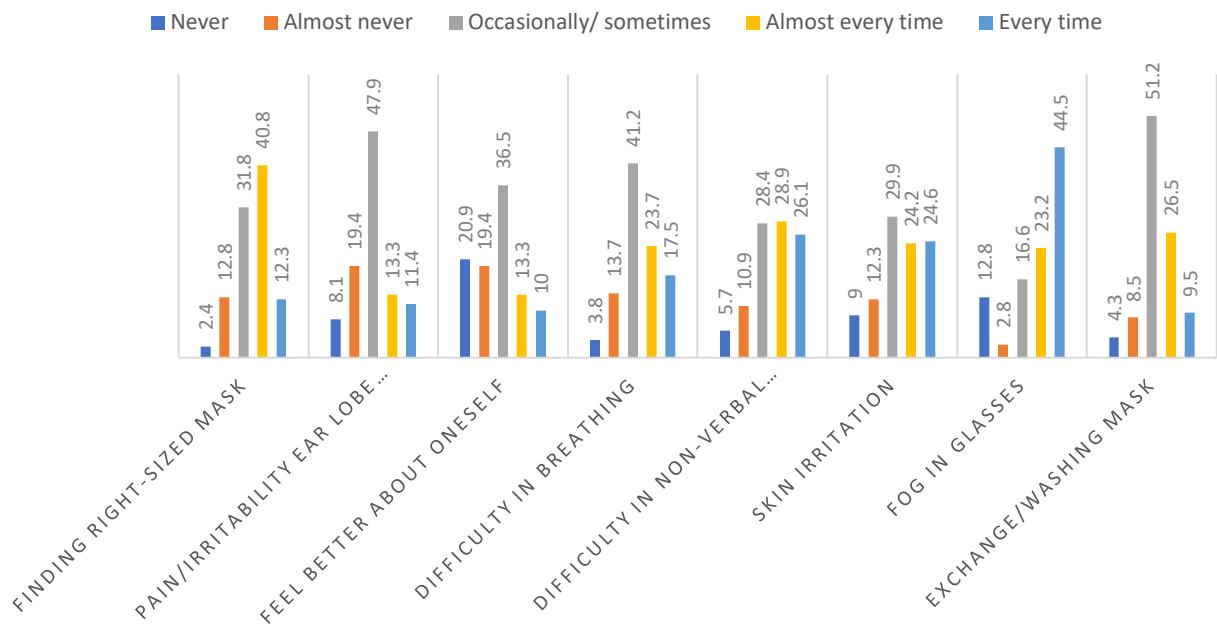


### LEVEL OF DISSATISFACTION

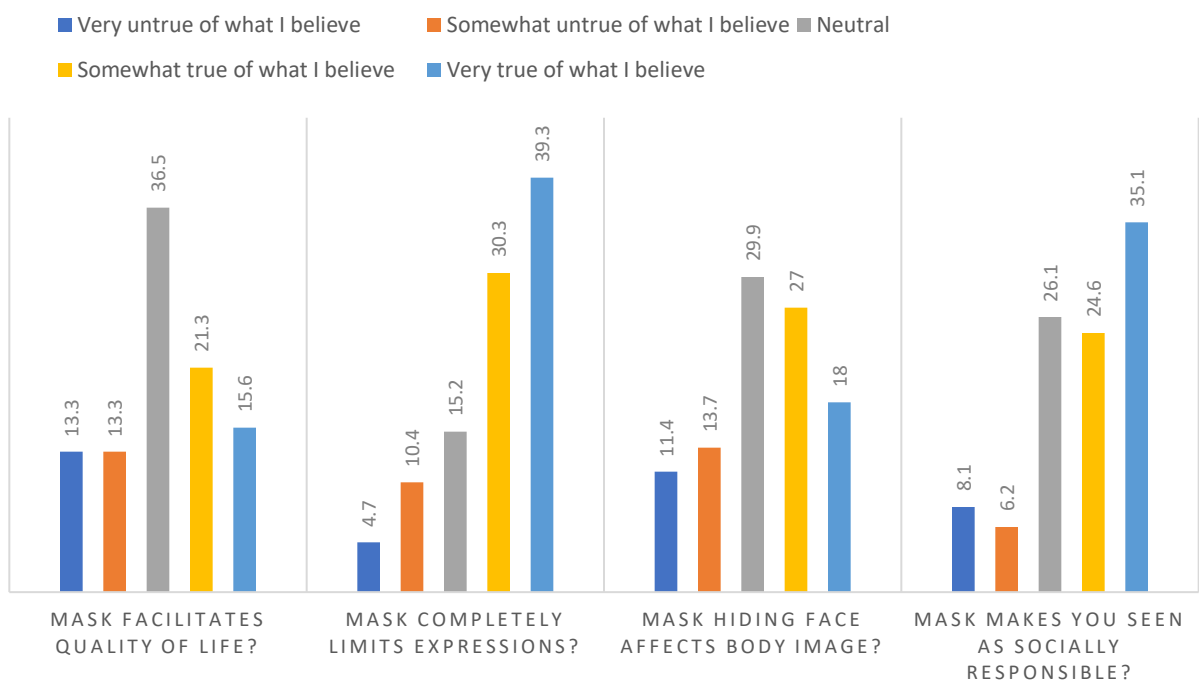
Extremely dissatisfied   Somewhat dissatisfied   Neither satisfied nor dissatisfied  
Somewhat satisfied   Extremely satisfied



### LEVEL OF FREQUENCY



### LEVEL OF BELIEF





## Appendix B

### IRB APPROVAL



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**To:** Mahendran Balasubramanian  
**From:** Justin R Chimka, Chair  
IRB Expedited Review  
**Date:** 09/21/2021  
**Action:** **Exemption Granted**  
**Action Date:** 09/21/2021  
**Protocol #:** 2107347129  
**Study Title:** COVID-19 Face Mask: User-Experience

The above-referenced protocol has been determined to be exempt.

If you wish to make any modifications in the approved protocol that may affect the level of risk to your participants, you must seek approval prior to implementing those changes. All modifications must provide sufficient detail to assess the impact of the change.

If you have any questions or need any assistance from the IRB, please contact the IRB Coordinator at 109 MLKG Building, 5-2208, or [irb@uark.edu](mailto:irb@uark.edu).

cc: Lily Grace Highley, Investigator

**Appendix C**  
**Questionnaire**

**Demographics**

1. What gender do you identify with?

Male (1)

Female (2)

Other (3)

2. How old are you?

18-24 (2)

25-34 (3)

35-44 (4)

45-54 (5)

Above 54 (1)

3. What classification are you in college?

Freshman (1)

Sophomore (2)

Junior (3)

Senior (4)

Grad Student (5)

Non- Degree Student (6)

Faculty (8)

Staff (9)

Other (7)

4. How would you describe your ethnicity? Select all that apply.

- White (1)
- Black or African American (2)
- American Indian or Alaska Native (3)
- Asian (4)
- Native Hawaiian or Pacific Islander (5)
- Other (6)

### **Face Mask**

1. What would be your rating for the comfort of your face mask while wearing it?
  - 1- Very uncomfortable
  - 2- Somewhat uncomfortable
  - 3- Neither comfortable nor uncomfortable
  - 4- Somewhat comfortable
  - 5- Very comfortable
2. How difficult it is to don and doff your face mask?
  - 1- Very difficult
  - 2- Difficult
  - 3- Neutral
  - 4- Easy
  - 5- Very easy
3. How satisfied are you with the fit of your face mask on your face while wearing it?
  - 1- Not at all satisfied
  - 2- Slightly satisfied
  - 3- Moderately satisfied
  - 4- Very satisfied
  - 5- Extremely satisfied
4. Do you agree the fit of your face mask affects the purpose of wearing face mask?

- 1- Strongly disagree
  - 2- Disagree
  - 3- Neither agree nor disagree
  - 4- Agree
  - 5- Strongly agree
5. How satisfied are you with the quality of your face mask?
- 1- Not at all satisfied
  - 2- Slightly satisfied
  - 3- Moderately satisfied
  - 4- Very satisfied
  - 5- Extremely satisfied
6. How easy is it for you to take care of your mask, in the aspects of washing and drying?
- 1- Very difficult
  - 2- Difficult
  - 3- Neutral
  - 4- Easy
  - 5- Very easy
7. How satisfied are you with your face mask in the aspect of fashion?
- 1- Not at all satisfied
  - 2- Slightly satisfied
  - 3- Moderately satisfied
  - 4- Very satisfied
  - 5- Extremely satisfied
8. How satisfied are you with your face mask in the aspect of style?
- 1- Not at all satisfied
  - 2- Slightly satisfied
  - 3- Moderately satisfied
  - 4- Very satisfied
  - 5- Extremely satisfied
9. How satisfied are you with your face mask in the aspect of color?
- 1- Not at all satisfied
  - 2- Slightly satisfied
  - 3- Moderately satisfied
  - 4- Very satisfied
  - 5- Extremely satisfied
10. How satisfied are you with your face mask in the aspect of price?
- 1- Not at all satisfied
  - 2- Slightly satisfied
  - 3- Moderately satisfied
  - 4- Very satisfied

- 5- Extremely satisfied
11. How satisfied are you with your face mask in the aspect of Size?
- 1- Not at all satisfied
  - 2- Slightly satisfied
  - 3- Moderately satisfied
  - 4- Very satisfied
  - 5- Extremely satisfied
12. How often are you able to find the right-sized face mask for you?
- 1- Never
  - 2- Almost never
  - 3- Occasionally/Sometimes
  - 4- Almost every time
  - 5- Every time
13. Do you believe that wearing a face mask facilitates your quality of life during this pandemic?
- 1- Very untrue of what I believe
  - 2- Somewhat untrue of what I believe
  - 3- Neutral
  - 4- Somewhat true of what I believe
  - 5- Very true of what I believe
14. How do you rate how easy it is to speak while wearing the face mask?
- 1- Very difficult
  - 2- Difficult
  - 3- Neutral
  - 4- Easy
  - 5- Very easy
15. Have you felt pain/irritability in your ear lobe areas due to the face mask strap?
- 1- Never
  - 2- Almost never
  - 3- Occasionally/Sometimes
  - 4- Almost every time
  - 5- Every time
16. How satisfied are you with the coverage provided by your face mask?
- 1- Not at all satisfied
  - 2- Slightly satisfied
  - 3- Moderately satisfied
  - 4- Very satisfied
  - 5- Extremely satisfied
17. Do you feel better about yourself when you wear face mask?
- 1- Never

- 2- Almost never
  - 3- Occasionally/Sometimes
  - 4- Almost every time
  - 5- Every time
18. Have you felt difficulty in breathing wearing a face mask?
- 1- Never
  - 2- Almost never
  - 3- Occasionally/Sometimes
  - 4- Almost every time
  - 5- Every time
19. Have you felt difficulty in non-verbal communication wearing a face mask?
- 1- Never
  - 2- Almost never
  - 3- Occasionally/Sometimes
  - 4- Almost every time
  - 5- Every time
20. Have you experienced skin irritation wearing a face mask?
- 1- Never
  - 2- Almost never
  - 3- Occasionally/Sometimes
  - 4- Almost every time
  - 5- Every time
21. Do you believe not showing your face completely limits your expressions?
- 1- Very untrue of what I believe
  - 2- Somewhat untrue of what I believe
  - 3- Neutral
  - 4- Somewhat true of what I believe
  - 5- Very true of what I believe
22. Do you believe that not showing your face affects your body image?
- 1- Very untrue of what I believe
  - 2- Somewhat untrue of what I believe
  - 3- Neutral
  - 4- Somewhat true of what I believe
  - 5- Very true of what I believe
23. Have you experienced fog in your glasses wearing a face mask?
- 1- Never
  - 2- Almost never
  - 3- Occasionally/Sometimes
  - 4- Almost every time
  - 5- Every time

24. How easy is it to hear someone when the speaker wears a face mask?

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- 1- Very difficult
- 2- Difficult
- 3- Neutral
- 4- Easy
- 5- Very easy

25. How often do you exchange or wash your mask?

- 1- Never
- 2- Almost never
- 3- Occasionally/Sometimes
- 4- Almost every time
- 5- Every time

26. Do you believe that wearing a face mask makes you seen socially responsible person?

- 1- Very untrue of what I believe
- 2- Somewhat untrue of what I believe
- 3- Neutral
- 4- Somewhat true of what I believe
- 5- Very true of what I believe