

**An Examination of Cultural Attitudes Toward Mask Use Through Social Construction of Technology**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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## Introduction

### Background

Mask wearing is an important tool in reducing transmission of COVID-19. Cloth masks have been found to be able to block 50-70% of particles as small as 10 microns (CDC, 2020). A November study from the American Institute of Physics found that the use of face masks by at least 70% of the population could lead to the “eradication” of the pandemic (American Institute of Physics, 2020). In addition, based on simulated case studies from April, widespread mask use was predicted to have a strong effect in reducing mortality rates from COVID-19 (Eikenberry, 2020). Eikenberry’s study concludes that “hypothetical mask adoption scenarios, for Washington and New York state, suggest that immediate near universal (80%) adoption of moderately (50%) effective masks could prevent on the order of 17–45% of projected deaths over two months in New York, while decreasing the peak daily death rate by 34–58%, absent other changes in epidemic dynamics.” Increased mask use can clearly play a role in preventing the spread of COVID-19, reducing deaths due to COVID-19, and eventually even ending the pandemic. Therefore, the objective of this research is to use social construction of technology to define national attitudes surrounding mask use, and to use knowledge of these attitudes to create strategies to encourage mask use among user groups with low levels of mask domestication.

This research will use the idea of technology domestication, the process by which a technology is adopted as an integral part of everyday life (Lehtonen, 2003). The stages of domestication progress from the technology functioning as a toy, then a mirror, then as art (Pantzat, 1997). In this first phase, the toy phase, the technology is viewed as a novelty. It is seen as special and interesting, but not necessary. For example, when television was first adopted, it was a special event to watch with one’s family. Next, the technology functions as a mirror, a

routine and practical technology focused on functional needs. This phase could describe the function of television in the present day. It is no longer always seen as a special event, and is often watched in the background while having other conversations or doing other work. In the final phase of domestication, the technology functions as art. Instead of reflecting reality, as in the mirror phase, it refashions it.

Domestication describes the process by which technologies evolve through these stages. There are many different ways in which technologies can evolve, but the two most relevant paths in the context of masks are from toys to instruments and from sensation to routine (Pantzat, 1997). In this first case, masks can be transformed from a toy, such as a fashion accessory, into a medical instrument. In the second, masks are transformed from an unfamiliar sensation to a routine article used and worn almost every day. These transformations take place when technologies become part of a larger system and help contribute to the system's goal (Pantzat, 1997). In the case of masks, this larger system could be the system of COVID-19 prevention, which includes masks, social distancing, and other safety measures intended to help prevent the spread of COVID-19.

In particular, the early stages of domestication are of interest, since the assessment of whether a technology is "needed" is performed collectively and largely relies upon recommendations and advice from members of one's social groups. These early stages are more informed by individual choices, while domestication in the later phases is more influenced by how well the technology is incorporated into its system (Pantzat, 1997). When masks are viewed as a domesticated technology, they are accepted and used regularly by a majority of members of a social group. Based on the important role that masks play in preventing the spread of COVID-19, it is important to encourage the rapid domestication of masks among all groups.

In addition, this study will use social construction of technology (SCOT) theory to examine the views of different social groups and to determine what factors might lead to domestication of mask technology within a group. SCOT theory explores the development of technologies as a process of selection by various relevant social groups. Technological artifacts can have different purposes and meanings for different groups, and so different social groups will value and select for different qualities in an artifact. In order for a technology such as masks to gain widespread adoption into daily life and become domesticated, stakeholders must define the technology's appeal and present the technology as appealing to a variety of social groups for a variety of reasons.

### **Methodology**

This study will define social groups by country. Although there are many possible factors to form groups around, nationality was selected because it is a straightforward category to sort users by and allows for the use of data on mask use and COVID infection rates by country. This will make it possible to compare the respective rates and consequences of mask domestication in each country. Two countries, the United States and South Korea, were chosen to focus on. Although future studies could make use of a wider sample of countries, the United States and South Korea were chosen because they have had different values surrounding mask use and different results in addressing COVID-19, making for an informative case study.

A March 2020 Gallup poll of attitudes toward COVID-19 and its prevention exemplifies the difference between these two social groups. In March 2020, 94% of South Korean respondents stated that they had adopted the use of medical masks to protect themselves from the virus, while only 9% of respondents in the United States had adopted masks (Gallup, 2020). These initial polls already suggest that in South Korea, where mask use is much more common,

masks are viewed as more of a domesticated technology than in the United States. Although the rate of mask use among Americans increased throughout the past year, this pattern of higher mask use in South Korea has held throughout the pandemic. As of April 2021, 69% of Americans answered that they “always” wear a face mask outside the home, compared to 92% of South Koreans (Imperial College London, 2021). Masks remain more of a domesticated technology among South Koreans, despite Americans’ increasing experience and familiarity with masks throughout the COVID-19 pandemic.

An examination of the history and cultural attitudes surrounding mask use in each country helps explain these different approaches to mask use and offer suggestions as to how domestication of masks might be encouraged in the United States, where the rate of mask use is lower. The history of mask use and the cultural values that relate to it were examined using primary sources in the form of public service announcements encouraging mask use and secondary sources studying the cultural context in which masks are adopted. To provide an overview of values, social groups, and mask use in each location, primary evidence was obtained starting with social media accounts for US public health officials and expanding to include public service announcements from various sources.

## **Research and Analysis**

### **South Korea**

It proved somewhat difficult to find primary sources of public health campaigns encouraging mask use in South Korea, likely because the idea of mask use was already extremely well established prior to the outbreak of COVID-19. This helps to demonstrate masks’ status as a domesticated technology, since a technology that is already almost universally used

does not require public health campaigns to explain or encourage its use. In addition, the reasons for this rapid acceptance of masks also provides insight into Korean attitudes surrounding masks. First, masks have already been used for medical reasons in South Korea prior to the start of the pandemic. The 2015 MERS-CoV outbreak, which resulted in 38 deaths, established the importance of face masks for preventing the spread of viruses (Lim et al., 2020). In addition, concerns about particulate matter such as yellow dust also encourage the use of masks for personal protection. Of the countries in the Organisation for Economic Cooperation and Development countries, South Korea has the highest levels of particulate matter, which can cause a variety of respiratory issues (Lim et al., 2020). Because of this, masks are generally valued in South Korea because they have already proven effective in preventing illness in multiple cases. In this case, masks have reached the mirror phase of domestication, since they have been proven to be practical and effective in everyday use. This example also shows the importance of time and experience in domestication of technology, since this familiarity with masks developed over a period of years. The drastic increase in mask use among Americans in the first few months of the pandemic also supports the idea that familiarity leads to the mirror phase of domestication, which leads to higher rates of mask use. The percentage of Americans who “always” wear a mask when outside steadily increased from 19% in April 2020, to 56% in June 2020, up to 73% by October 2020, where it has remained since (Imperial College London, 2021). However, American mask use has plateaued at around 70% and has not further increased since October (Imperial College London, 2021), suggesting that the time-related increase in domestication has already taken place among Americans and may not continue to increase with time. Even after increased domestication over time, though, rates of mask use are still higher in South Korea,

meaning that other cultural attitudes are likely at play affecting the rates of mask use in each country.

Masks have also become established in South Korea as a fashion accessory. In 2009, wearing Sakun-brand masks became a popular trend among young people after a boy band member was photographed wearing a Sakun mask (Kim, 2020). Prior to 2009, masks were already used occasionally to prevent the spread of illness, but their popularity for both medical and aesthetic reasons greatly increased after 2009. This increase in mask use shows the role that endorsements play in domestication: if a technology is portrayed as desirable, such as being associated with a popular celebrity, it is more likely to be adopted by users. Fans of the celebrity who used the technology could even be viewed as another social group who value the recommendations and opinions of that celebrity. The use of celebrity endorsements could prove an effective tactic to encourage mask use among groups that have not already adopted masks. In the context of domestication, this shows the importance of the toy phase of domestication. In South Korea, masks were first viewed as a fun accessory. This laid the groundwork for masks to progress to the next phase of domestication, the mirror phase, much earlier and in a more widespread manner in South Korea than in the United States, which did not experience the toy phase of mask use.

### **United States**

A sample of US public service announcements related to mask use attempt to appeal to various values held by Americans. As also seen in the South Korean response to the pandemic, one theme is a focus on community. A tweet from Rochelle Walensky, director of the CDC, uses her roles “as a wife, mother, daughter, physician & CDC Director” to ask readers to continue to

wear masks (Walensky, 2020). This reminder of readers' own social relationships is meant to encourage Americans to wear masks for the sake of their families.

However, most messaging is more individually-focused, encouraging Americans to wear masks for the benefits it will provide them, not others. The "For All the Things You Love, Wear a Mask" campaign from the American Hospital Association asks viewers to wear a mask "for the love of" various activities they might want to return to, such as birthday parties, concerts, and road trips with friends (American Hospital Association, 2020). Similarly, a public service announcement from the CDC encourages mask use so that we can "get back to doing our favorite things" (CDC, 2020). This tactic seems well-suited to appealing to Americans, given the strong emphasis in American society on individualism. In a March 2020 Gallup poll, 21% of South Korean respondents strongly agreed and 3% strongly disagreed with the statement "I am willing to sacrifice some of my human rights if it helps prevent the spread of the virus," while 9% of American respondents strongly agreed and 3% strongly disagreed (Gallup, 2020). In addition, this appeal to individual values is well-suited to the early phase of domestication that the United States is in. While South Korea has fully moved into the mirror phase, the United States seems to be somewhere between the toy and mirror phases. Because masks are earlier in the domestication process in the United States, individual preferences make more of a difference in mask use in the United States than in South Korea.

However, there is a strong opposition to mask use in the United States, as well, driven by the same individualist values that the AHA and CDC public service announcements attempt to appeal to. An advertisement released in July by Louisiana state representative Danny McCormick criticizes mask mandates for restricting personal freedoms, stating that "the constitution is being shredded before our very eyes" (Hall, 2020). It's important to note the



importance of individualist values in this attitude: the social groups that hold this attitude toward mask use clearly value individual freedom highly, so those same individualist values might be effective when attempting to encourage mask use, as in the AHA and CDC advertisements. This strategy might offer a path toward encouraging mask use among social groups that generally are opposed to mask use.

Finally celebrity endorsements are a common tactic. In a public service announcement from the State of New York, Paul Rudd uses humor to portray masks as a simple solution that don't pose a large burden on the wearer, ending with the tagline "Wear your mask. It's science. Ugh!!!" Because they primarily appear to the social group of the celebrity's fans, and therefore depend more on the celebrity's popularity than national cultural values, celebrity endorsements are likely to be effective across national borders. This approach also fits well with the fact that the United States is still in the toy phase of domestication. If masks can be portrayed as desirable and fun due to a celebrity connection, mask use can be viewed as being in the toy phase. Similar to the case in South Korea, masks being widely used in the toy phase can lay the groundwork for them to be even more widely adopted in the mirror phase of domestication.

### **Recommendations and Conclusion**

There appears to be a great deal of overlap in the Korean and American approaches, with both groups using a focus on community and celebrity endorsements. However, these approaches are clearly finding more success in South Korea, where there have been 209 COVID-19 cases and 3 deaths for every 100,000 residents (Pettersson et al., 2021). For comparison, there have been 9,451 cases and 171 deaths per 100,000 people in the United States (Pettersson et al., 2021). This raises the question: can the American approach be adapted to be more similar to the South Korean approach, or is an approach tailored to American culture needed?

The South Korean approach seemed to have yielded more success for multiple reasons. First, there is the fact that many Koreans were already used to wearing masks before the COVID-19 pandemic even began. Because masks were already accepted as a domesticated technology, there was less resistance to mask use, particularly early in the pandemic. In addition, cultural differences between the two countries likely play a large role. In South Korea, the concept of *inhwa*, “a culture of harmony between people that is seen as a social value” encourages the use of masks, prior to and during the pandemic (Kim, 2020). In contrast, Josef Woodman, CEO of Patients Beyond Borders, identifies the image of “the rugged individualist heading West in their wagon trains” as an important cultural symbol for Americans (Kim, 2020). This difference in self-perception and values by each group likely explains why there is much more vehement opposition to mask use in the United States, since many opponents view mask mandates as a violation of individual freedom. In addition, for Koreans used to masks as a domesticated technology, mask mandates are seen as a proven tactic, not a sudden violation of rights. For these reasons, public service announcements focused on the individual benefits of mask use are likely to be more successful in encouraging mask use, since individualism is a trait important in the American social group. Rather than trying to combat the individualism that drives many Americans to resist the domestication of masks, it may prove more effective to make use of that value. It would be extremely difficult to change long-held values of a social group, so the best approach will be to craft public health messaging to appeal to those values.

In addition, the fact that the United States and South Korea are in different phases of mask domestication is relevant to consider when crafting a message to encourage mask use. While South Korea is firmly in the mirror phase of domestication, with masks viewed as a practical, established, everyday technology, the United States is somewhere between the mirror

and toy phases. Many people in the United States use masks daily, while others still view them as a novelty, and some even oppose their use altogether. Because the United States is earlier in the domestication process, it again makes more sense to use an approach focused on individualism. As identified by Pantzar, individual choice is particularly influential in determining whether a technology is adopted by a user in the early phases of domestication. In particular, focusing on the individual benefit to users and appealing to users' individualism could even help persuade members of social groups that view masks as opposed to individualism that masks can instead be an expression of individualism.

South Korea and the United States have different cultural values and different rates of mask use. Therefore, in order to encourage mask use in the United States, where rates of mask use are lower, a different approach, more tailored towards ideas valued by the American social group, such as individualism, should be used.

## References

*Anti-mask Republican wields chainsaw and blowtorch while comparing safety mandates to*

*Nazi Germany.* (2020, July 9). The Independent.

<https://www.independent.co.uk/news/world/americas/us-politics/face-mask-republican-coronavirus-louisiana-danny-mccormick-chainsaw-blowtorch-a9611041.html>

CDC. (2020, February 11). *Coronavirus Disease 2019 (COVID-19)*. Centers for Disease Control and Prevention.

<https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/masking-science-sars-cov2.html>

Eikenberry, S. E., Mancuso, M., Iboi, E., Phan, T., Eikenberry, K., Kuang, Y., Kostelich, E., & Gumel, A. B. (n.d.). *To mask or not to mask: Modeling the potential for face mask use by the general public to curtail the COVID-19 pandemic.* 20.

*ICL YouGov Covid-19 Tracker\_V1—Institute of Global Health Innovation | Tableau Public.*

(n.d.). Retrieved April 9, 2021, from

[https://public.tableau.com/profile/ighi#!/vizhome/ICLYouGovCovid-19Tracker\\_V0\\_3/1/Specificpreventativebehaviourbycountry](https://public.tableau.com/profile/ighi#!/vizhome/ICLYouGovCovid-19Tracker_V0_3/1/Specificpreventativebehaviourbycountry)

Kim, C. (n.d.). *What a Korean Teenage Fashion Trend Reveals About the Culture of*

*Mask-Wearing.* POLITICO. Retrieved April 9, 2021, from

<https://www.politico.com/news/magazine/2020/08/11/what-a-korean-teenage-fashion-trend-reveals-about-the-culture-of-mask-wearing-393204>

*Known millennial Paul Rudd made a PSA telling you to wear a mask, fam.* (n.d.). EW.Com.

Retrieved April 9, 2021, from <https://ew.com/news/paul-rudd-coronavirus-mask-psa/>

- Lim, S., Yoon, H. I., Song, K.-H., Kim, E. S., & Kim, H. B. (2020). Face masks and containment of COVID-19: Experience from South Korea. *The Journal of Hospital Infection*, 106(1), 206–207. <https://doi.org/10.1016/j.jhin.2020.06.017>
- Pantzar, M. (1997). Domestication of Everyday Life Technology: Dynamic Views on the Social Histories of Artifacts. *Design Issues*, 13(3), 52–65. <https://doi.org/10.2307/1511941>
- Pettersson, H., Manley, B., Hern, S., ez, & CNN. (n.d.). *Tracking Covid-19's global spread*. CNN. Retrieved April 9, 2021, from <https://www.cnn.com/interactive/2020/health/coronavirus-maps-and-cases>
- Physics, A. I. of. (n.d.). *Face masks slow spread of COVID-19; types of masks, length of use matter*. Retrieved April 9, 2021, from <https://phys.org/news/2020-11-masks-covid-length.html>
- Pinch, T. J., & Bijker, W. E. (1989). The social construction of facts and artifacts: Or how the sociology of science and the sociology of technology might benefit each other. In W. Bijker, T. Hughes, & T. J. Pinch (Eds.), *The Social Construction of Technological Systems* (pp. 17–50). MIT Press.
- Rochelle Walensky, MD, MPH. (2021, March 29). We have so much to look forward to as we work to get Americans vaccinated against #COVID19, but right now I am alarmed to see cases climbing. We do not have the luxury of inaction. Each of us must do all we can to #StopTheSpread of the virus and prevent a fourth surge. [Tweet]. @CDCDirector. <https://twitter.com/CDCDirector/status/1376595430398648332>
- The Coronavirus: A vast scared majority around the world*. (n.d.). Retrieved April 9, 2021, from

<https://www.gallup-international.com/survey-results/survey-result/the-coronavirus-a-vast-scared-majority-around-the-world>

*Wear A Mask Campaign* | AHA. (n.d.). Retrieved April 9, 2021, from

<https://www.aha.org/wearamask>

*Workbook: YouGov & ICL COVID-19 Behaviour Tracker*. (n.d.). Retrieved April 9, 2021, from

<https://ichpanalytics.imperialcollegehealthpartners.com/t/BDAU/views/YouGovICLCOVID-19BehaviourTracker/4Allbehaviorsovertime?:iid=1&:isGuestRedirectFromVizportal=y&:embed=y>