

EXTROVERSION AS A POTENTIAL RISK FACTOR FOR INCREASED SPREAD OF COVID-19 IN THE UNITED STATES DURING A GLOBAL PANDEMIC†

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INTRODUCTION

Starting in December 2019, the world has been gripped by a pandemic which disrupted social, political, economic, and learning environments in unexpected ways. Caused by the novel coronavirus SARS-CoV-2, which leads to the disease COVID-19, this pandemic has resulted in widespread implementation of mask mandates, social distancing or quarantine orders, and societal “shelter-in-place” orders on a massive scale. As with any public health crisis, public messaging is critical to spread correct and timely information, as well as to provide up-to-date medically sound guidelines for keeping the populace safe. Despite being a developed country with significant financial resources and a widespread medical system, the United States has previously shown and continues to show much higher death rates and more difficulty in controlling coronavirus infections than many other developed countries.¹ This essay will examine the potential impact of introverted and extroverted personality types on adherence to public health guidelines in the United States during this pandemic.

Introversion and extroversion are typically considered to be two ends of a spectrum of personality traits. Introverts are often viewed as quiet, socially reserved “loners” who prefer not to engage in social activity. Extroverts are viewed as more outgoing, friendly, and in need of social

† This is the third place essay for an interprofessional writing competition held by the *Syracuse Law Review*. To accommodate various professional fields, the citations are a blend of APA and Bluebook style formats. Sources and details have not been independently verified by *Syracuse Law Review* and *Syracuse Law Review* did not complete a peer review of the study or of the conclusions drawn by the authors.

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1. Bilinski, A., & Emanuel, E. J. (2020). COVID-19 and Excess All-Cause Mortality in the US and 18 Comparison Countries. *JAMA*, 324(20), 2100-2102. doi:10.1001/jama.2020.20717.

contact to be happy.² Of course, these are two extremes on the scale, and most people would identify themselves somewhere in the middle of the spectrum. In the United States, the overarching culture of our society tends to praise and reward extroversion as a desirable personality trait. Although many subcultures do exist given the diversity in heritage of U.S. citizens, a person who is outgoing, sociable, and friendly is often viewed as more successful and popular than someone who keeps to themselves and does not interact with others as frequently.³ Therefore, there is significant peer pressure at all stages of life to engage in social interactions, through personal gatherings, social media participation, and participation in family- or friend-oriented traditions (such as Christmas, Hanukkah, Thanksgiving, or other observed holidays). During the COVID-19 pandemic, these activities suddenly became “risky behaviors” overnight, resulting in a radical shift in societal interactions, as well as causing significant mental/emotional distress.⁴ Some studies have suggested that introverts were generally impacted less by these strict social measures, given their natural tendencies toward mild social aversion.⁵ Indeed, small gatherings leading to community spread are now considered one of the major sources of COVID-19 transmission, rather than work-related or clinic care-related infections.⁶

2. Fishman, I., Ng, R., & Bellugi, U. (2011). Do extraverts process social stimuli differently from introverts? *Cognitive neuroscience*, 2(2), 67-73. doi:10.1080/17588928.2010.527434.

3. Feiler, D. C., & Kleinbaum, A. M. (2015). Popularity, similarity, and the network extraversion bias. *Psychol Sci*, 26(5), 593-603. doi:10.1177/0956797615569580.

4. Liu, S., Lithopoulos, A., Zhang, C. Q., Garcia-Barrera, M. A., & Rhodes, R. E. (2021). Personality and perceived stress during COVID-19 pandemic: Testing the mediating role of perceived threat and efficacy. *Pers Individ Dif*, 168, 110351. doi:10.1016/j.paid.2020.110351; Robillard, R., Saad, M., Edwards, J., Solomonova, E., Pennestri, M. H., Daros, A., Kendzerska, T. (2020). Social, financial and psychological stress during an emerging pandemic: observations from a population survey in the acute phase of COVID-19. *BMJ Open*, 10(12), e043805. doi:10.1136/bmjopen-2020-043805.

5. Wijngaards, I., Sisouw de Zilwa, S. C. M., & Burger, M. J. (2020). Extraversion Moderates the Relationship Between the Stringency of COVID-19 Protective Measures and Depressive Symptoms. *Front Psychol*, 11, 568907. doi:10.3389/fpsyg.2020.568907.

6. Governor Andrew M. Cuomo. (2020a). Governor Cuomo Releases New PSA Highlighting the Dangers of COVID-19 Transmission Through 'Living Room Spread' [Press release]. Retrieved from <https://www.governor.ny.gov/news/governor-cuomo-releases-new-psa-highlighting-dangers-covid-19-transmission-through-living-room>; Governor Andrew M. Cuomo. (2020b). Video, Audio, Photos & Rush Transcript: Governor Cuomo Updates New Yorkers on State's Progress During COVID-19 Pandemic [Press release]. Retrieved from <https://www.governor.ny.gov/news/video-audio-photos-rushtranscript-governor-cuomo-updates-new-yorkers-states-progress-during-8>; Penn Medicine. (2020). Superspreader Events and Small Gatherings: COVID-19 Safety Tips. Health and Wellness. Retrieved from <https://www.pennmedicine.org/updates/blogs/health-and-wellness/2020/december/covid-super-spreader>; See Liu, *supra* note 4; See also Wijngaards, *supra* note 5; See also interviews

Given this information, this essay proposes that the U.S. culture of promoting extroversion as a desirable trait has hindered efforts to control COVID-19 by reducing adherence to social distancing and other public health guidelines. To combat this issue, public messaging must account for and adjust to the differences in potential adherence to guidelines based on self-identified personality traits, rather than focusing only on common psychological elements of target audiences.

I. CULTURAL VIEWS ON INTROVERSION & EXTROVERSION

Humans are generally seen as social creatures, with an innate need to connect with other humans and have social interactions in order to thrive. In fact, many studies of history and culture have concluded that cooperation, rather than rivalry and competition, are often favored when humans must interact frequently.⁷ This is because cooperation seems to be a stable strategy for ensuring survival of large populations.⁸ For example, early humans would have quickly found that several hunters working together could more easily capture and kill a large predator than if each hunter attempted the feat alone. By working together, more resources could be procured to benefit the group as a whole, with more limited risk to each individual. Humans are not unique in our penchant for cooperation; indeed, many species of animals, plants, and even microbes use cooperation to enhance survival of their lineages. Participation in cooperative efforts is also seen as a way to signal favorable qualities to potential mates, both among animals and humans.⁹ Therefore, it's not surprising that many cultures – including those found in the United States—promote social interactions and cooperation between individuals.

Introversion and extroversion as personality traits were made popular by Carl Jung, but the interpretation of these concepts has since evolved significantly. Today, these traits are viewed as two ends of a spectrum of personality, with people tending towards one end of the spectrum or the other by preference. Introversion is now described as elevated interest in one's mental self, with mental and physical energy

with Dr. Anthony Fauci, November 25, 2020 (found online from various sources including Good Morning American and NBC) for more detailed information.

7. Hilbe, C., Chatterjee, K., & Nowak, M. A. (2018). Partners and rivals in direct reciprocity. *Nature Human Behaviour*, 2(7), 469-477. doi:10.1038/s41562-018-0320-9.

8. The cooperative human. (2018). *Nature Human Behaviour*, 2(7), 427-428. doi:10.1038/s41562-018-0389-1.

9. *Id.*

being replenished by “alone time” or reflection, and depleted by social interactions. Introverts tend to gravitate towards reading, meditating, writing, or other individual activities, and may be overwhelmed by social environments with high levels of activity or stimulation. On the other hand, extroverts are described as people who gain mental and physical energy from social interaction, and in fact thrive off of this stimulation. Extroverts prefer to engage with parties, business or political groups, or participate in group activities, and may be easily bored by “alone time”. They are described as gaining gratification from others, rather than from their own mental self.¹⁰ These descriptions are obviously two extremes on a spectrum, so most people fall somewhere in between these states. While rarely discussed, ambiverts are people who fall essentially in the direct middle, being mostly comfortable and extroverted in groups or with family, but also enjoying “alone time” and being more introverted among strangers or authority figures.¹¹

It is no secret that extroversion is considered a highly desirable trait in the United States, and extroverts are hailed as highly successful and popular individuals. Despite a relative lack of formal research on this cultural element, many news stories and books have addressed this clear and ever-present cultural element. As an example, the following headlines have recently appeared in search engines: “Why Does America Love Its Extroverts?” (Huffington Post), “I’m Sick of Our Culture’s Bias Against Introverts . . .” (Forbes), and “4 Advantages Extroverts Consistently Have Over Introverts At Work, According to a New Study” (Inc. Business Insider). A recent book by Susan Cain, a Harvard law school graduate, former attorney, and former negotiator, suggests that Western culture mistakes the reflective nature of introverts for a lack of attention, thinking ability, or drive to succeed. She argues that introversion is simply another way of approaching leadership and problems, and that promoting extroversion – as U.S. culture does – can be harmful to individual and societal growth.¹² Generally, media reports suggest that in the United States, extroverts are typically viewed as

10. Cain, S. (2012). *Quiet: The Power of Introverts in a World That Can't Stop Talking*. New York City, NY: Crown Publishing Group; Fishman, I., Ng, R., & Bellugi, U., *supra* note 2; Merriam-Webster. *Extroversion*. Merriam-Webster. Web; Merriam-Webster. *Introversion*. Merriam-Webster. Web.

11. Davidson, I. J. (2017). The ambivert: A failed attempt at a normal personality. *J Hist Behav Sci*, 53(4), 313-331. doi:10.1002/jhbs.21868.

12. Cain, S., *supra* note 10.

happier, more successful, better at thinking on their feet, better equipped to lead others and navigate tough situations, and more likable. Being introverted is viewed as being “quiet” or “shy” in a way that is detrimental to individual or company performance, and therefore it is considered “better” to be extroverted.

Many of the learning and business institutions in the United States are structured around personal and social interaction. For example, many universities and colleges include an element of class participation (rather than just attendance) in order to receive top grades in courses. This often includes requirements to speak or present in class, and group projects are also often included. These activities are areas where extroverts can thrive, but introverts may naturally struggle due to their social preferences. In business, face-to-face meetings or negotiations, social outings with clients/customers, and business presentations are also a frequent element of “success” for higher level manager or C-suite positions. Introverts again may struggle with these activities, even if they are highly successful and competent leaders in other ways. Many successful and famous individuals were considered introverts, including Albert Einstein, J.K. Rowling, Bill Gates, and Isaac Newton, all of whom embraced their introversion as a positive trait.¹³ One study linked introverted tendencies to higher intelligence when measured by adult intelligence tests,¹⁴ and introverts were shown to get equal test scores in a studied college course despite their preference for avoiding group-work compared to extroverts.¹⁵ In early schooling, many children are encouraged to play and interact with others to help social development, but individual activities such as reading during recess may be discouraged. A preference for individual activities is often viewed as shyness or antisocial behavior, and educators often try to force children to overcome these tendencies “for their own good.” These beliefs regarding introversion and extroversion are not intentionally malicious

13. See Rampton, J. (2015). 23 of the Most Amazingly Successful Introverts in History. Retrieved from <https://www.inc.com/john-rampton/23-amazingly-successful-introverts-throughout-history.html>, which provides a popular list, confirmed by further research in biographies, autobiographies, etc.

14. Kirkcaldy, B. D., & Siefen, G. (1991). Personality correlates of intelligence in a clinical group. *Psychol Rep*, 69(3 Pt 1), 947-952. doi:10.2466/pr0.1991.69.3.947.

15. Persky, A. M., Henry, T., & Campbell, A. (2015). An exploratory analysis of personality, attitudes, and study skills on the learning curve within a team-based learning environment. *American journal of pharmaceutical education*, 79(2), 20-20. doi:10.5688/ajpe79220.

or harmful, and stem from cultural beliefs that cooperation and interaction are helpful and necessary for our species to survive and thrive. However, these behaviors ingrain in United States children and adults the belief that introversion is “bad” and is something to be overcome or corrected, with extroversion being the preferred personality trait. This can create significant peer pressure to change one’s personality, especially among younger children whose primary desire is conformity.

In the altered social landscape that resulted from the COVID-19 pandemic, these cultural beliefs were unaffected, but the feasibility of expressing extroverted tendencies became significantly limited. Therefore, social responses to the pandemic may have been affected by both self-identified and desired tendencies on the introversion-extroversion spectrum.

II. PANDEMIC RESPONSES OF INTROVERTS & EXTROVERTS

As mentioned above, many traditional social behaviors were prohibited or limited as a result of the spread of COVID-19. Specifically, social gatherings, close physical contact with others, in-person work and events, dining, entertainment, and contact with those outside of the immediate household were prohibited, limited, or strongly discouraged. All of these activities involve social interaction with other people, especially those outside the household, so limits on these engagement opportunities caused mental and emotional stress among U.S. citizens.

The federal government proposed a set of guidelines during this time based on the guidance of the WHO and CDC, but states were generally allowed to determine their own rules regarding these social activities. As cases rose and fell in various states and even areas within the states, local and state governments further restricted these activities or loosened the restrictions needed to control spread of the virus. This resulted in some areas of the country being under strict lockdown while others had much more apparent freedom, because viral spread was not consistent over time in the entire country. This provided an added layer of stress, because online and social media content was available at all times, allowing those in areas with stricter rules to see the less restricted activities of those in areas with fewer cases. In addition, reporting transparency and governmental opinions on the severity of the outbreak, as well as public messaging on potential risks and necessary protective actions, were highly heterogeneous throughout the country. In some areas, risk was described as high, and strict protective actions were encouraged along

with highly transparent case reporting. In other areas, governmental representatives chose to downplay the threat and have many businesses remain open to avoid panic and economic repercussions. This led to confusion over the true possible impact and severity of COVID-19, and distrust in the advice and mandates of government officials.

The limited social behaviors described are more commonly engaged in by people who would identify themselves as “extroverts,” because with the exception of in-person work activities, they involve conscious choice to socialize and be around other people. However, while survey-based studies were done to assess adherence to guidelines in the United States, very few studies used self-identification as “introverted” or “extroverted” as a factor under consideration. This is a serious limitation to the information available and efforts to improve adherence, because by their nature, people who identify as “extroverts” are more likely to engage in these prohibited behaviors. A recent study found that extroversion was correlated with less compliance with social distancing guidelines.¹⁶ Indeed, peer pressure at many levels acts to encourage social behaviors, and it stands to reason that this would continue to be the case during a pandemic. For example, many news reports and social media postings have highlighted anecdotal evidence of family-driven pressure to attend holiday gatherings this year. Despite clear guidance to avoid gatherings with anyone outside of the immediate household, many individuals reported that their families had pressured them to attend holiday gatherings with others, or had become upset and vocal when the individual expressed a desire to stay home instead. In another example, a recent study found that while mask-wearing behaviors increased over time as cases rose in the United States, this rise in mask use was not correlated with the introduction of government mandates regarding mask use.¹⁷ Instead, the likelihood of wearing a mask was increased by seeing others wearing a mask at least “rarely,” increased as others were seen with masks more frequently (“sometimes,” “often,” or “always”), and also increased with perceived peer pressure to wear a mask.¹⁸ Therefore,

16. Carvalho, L. F., Pianowski, G., & Gonçalves, A. P. (2020). Personality differences and COVID-19: are extroversion and conscientiousness personality traits associated with engagement with containment measures? *Trends Psychiatry Psychother*, 42(2), 179-184. doi:10.1590/2237-6089-2020-0029.

17. Rader, B., White, L. F., Burns, M. R., Chen, J., Brilliant, J., Cohen, J., . . . Brownstein, J. S. (2020). Mask Wearing and Control of SARS-CoV-2 Transmission in the United States. *medRxiv*. doi:10.1101/2020.08.23.20078964.

18. Barile, J. P., Guerin, R. J., Fisher, K. A., Tian, L. H., Okun, A. H., Vanden Esschert, K. L., . . . Prue, C. E. (2020). Theory-based Behavioral Predictors of Self-reported Use of

government mandates did not increase mask-wearing behavior, yet the perceived opinions and observed behaviors of others did alter mask-wearing behaviors. This suggests that peer pressure can affect adherence to public health guidelines, despite clear directions from the government and scientists.

Small gatherings are now considered to be the primary source of community-based transmission of COVID-19, rather than transmission in public places, at work, or in schools.¹⁹ Again, state governments in many areas (including New York) have indicated that individuals should not attend gatherings of any size with others outside the household, or should limit gatherings to a certain number of people. As the cases have risen, these guidelines have become more strict. Fines have even been levied in some cases to encourage adherence to these rules for both businesses and individuals.²⁰ However, a recent study found that as cases rose, more people attended small gatherings, despite these governmental mandates.²¹ This is likely due to the clustering of several major U.S. holidays (Halloween, Thanksgiving, Christmas, and New Year's Eve) within a short span of time, all of which traditionally involve family- or friend-oriented gatherings. Rather than remaining socially distanced to avoid spreading COVID-19, many individuals chose to gather for these holidays, leading to a visible and clear spike in case numbers following these holidays. In these situations, social status and others' perceptions of the individual were viewed as more important than the potential risk of contracting or spreading COVID-19. However, other studies have shown that while mental distress did rise at first after stay-at-home

Face Coverings in Public Settings during the COVID-19 Pandemic in the United States. *Ann Behav Med.* doi:10.1093/abm/kaaa109

19. Governor Andrew M. Cuomo. (2020a), *supra note 6*; Governor Andrew M. Cuomo. (2020b) *supra note 6*.

20. See representative examples such as the Empire State Development. (2020). Novel Coronavirus FAQ for Businesses. Retrieved from <https://esd.ny.gov/novel-coronavirus-faq-businesses>; Michigan.gov. (2020). State cites nine businesses, for COVID-19 Workplace Safety violations [Press release]. Retrieved from <https://www.michigan.gov/coronavirus/0,9753,7-406-98158-546655--,00.htm>; The Office of Governor Ned Lamont. (2020). Governor Lamont Announces Fines for Businesses Violating COVID-19 Rules Increase To \$10,000 [Press release]. Retrieved from <https://portal.ct.gov/Office-of-the-Governor/News/Press-Releases/2020/11-2020/Governor-Lamont-Announces-Fines-for-Businesses-Violating-COVID-19-Rules-Increase-To-10000>.

21. Sheehan, M. M., Pfoh, E., Speaker, S. L., & Rothberg, M. (2020). Changes in Social Behavior Over Time During the COVID-19 Pandemic. *Cureus*, 12(10), e10754. doi:10.7759/cureus.10754.

orders, responsiveness to mask use and social distancing guidelines also increased early on in the pandemic.²² This suggests that either people have begun to reverse responsiveness to these guidelines over time, or that a subset of individuals within the community are the primary group engaging in “risky” social behaviors despite guidance.

The importance of peer pressure in pandemic response is also visible in the hoarding of goods that has occurred in waves since the beginning of the pandemic.²³ This practice was so extreme that in some cases, goods such as toilet paper, paper towels, and hand soap had to be limited per customer to keep these essentials in stock. A recent study found that “Gen X” and “millennial” respondents were much more likely to increase their purchasing behaviors during the pandemic, compared to “baby boomer” respondents.²⁴ This suggests that responses to public messaging, social media content, and the opinions of others regarding purchasing goods to “stock up” may show generational differences.

Another critical component of the behaviors of introverts versus extroverts during the pandemic is the magnitude of behavioral change required of these individuals. Someone who identifies as “extroverted” likely spends a significant amount of time socializing with others, going to gatherings, and generally interacting with those outside of their household. Self-identified “introverts”, on the other hand, are less likely in general to engage in these behaviors, or engage in them to a lesser degree than extroverts. Therefore, the mandates for social distancing and limits on gatherings would require a larger degree of behavioral change from extroverts than from introverts. If extroverts altered their behaviors by the same degree that introverts did, they would still be more likely to engage in these social behaviors, and thus at a higher risk of contracting COVID-19. Unfortunately, any engagement in social behavior has potential for transmission of COVID-19, so even if extroverts only went to one gathering per month instead of many, they would still be at a higher risk of getting infected than introverts who went to no gatherings

22. Liu, Y., & Mattke, S. (2020). Association between state stay-at-home orders and risk reduction behaviors and mental distress amid the COVID-19 pandemic. *Prev Med, 141*, 106299. doi:10.1016/j.ypmed.2020.106299.

23. Li, D., Chaudhary, H., & Zhang, Z. (2020). Modeling Spatiotemporal Pattern of Depressive Symptoms Caused by COVID-19 Using Social Media Data Mining. *Int J Environ Res Public Health, 17*(14). doi:10.3390/ijerph17144988.

24. Clements, J. M. (2020). Knowledge and Behaviors Toward COVID-19 Among US Residents During the Early Days of the Pandemic: Cross-Sectional Online Questionnaire. *JMIR Public Health Surveill, 6*(2), e19161. doi:10.2196/19161.

rather than a few. Therefore, the degree of behavioral change required of extroverts is higher than for introverts to meet current guidelines, and this was not taken into account when providing public messaging. Indeed, it is possible that extroverts may feel they are successfully adhering to guidelines because they significantly decreased their social participation, even though they may still be occasionally going to gatherings or businesses. In addition, a recent study showed that extroversion was associated with increased stress levels during the pandemic,²⁵ suggesting that social distancing and stay-at-home orders may have a larger impact on the mental well-being of individuals who identify as extroverted.

Freedom and perceived freedom is also a significant motivator among U.S. citizens, because our society places major emphasis on maintaining freedoms that are not infringed upon by government. Many legal challenges and lawsuits have been filed by citizens concerned that the government mandates put in place during the pandemic are violating their personal freedoms. Supreme Court Justice Samuel Alito recently made a speech claiming that “The pandemic has resulted in previously unimaginable restrictions on individual liberty . . . We have never before seen restrictions as severe, extensive and prolonged as those experienced for most of 2020.”²⁶ Indeed, many places of worship have also filed lawsuits because they were prevented from holding services or had attendance levels severely limited. For individuals, the freedom to gather and engage with others socially, which had previously been considered a guarantee, has now been removed or limited in many cases as well. In the same way, the stress response to removal of these freedoms may be enhanced among extroverts,²⁷ who previously may have taken advantage of these opportunities more often.

In summary, the impact of extroversion and introversion on COVID-19 guideline adherence has been poorly addressed. However, extroversion likely has a significant impact on adherence to social distancing guidelines, because personality traits of those identifying as extroverted may increase likelihood to engage in potentially risky social behaviors during the pandemic. Peer pressure and perceived attitudes of others play a significant role in individual responses to mask mandates

25. Liu, S., *supra* note 4; Robillard R., et al, *supra* note 4.

26. Alito, S. (Producer). (2020). Address by Justice Samuel Alito. 2020 *National Lawyers Convention: The Rule of Law and the Current Crisis*.

27. Liu, S., *supra* note 4.

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and other guidelines. Attending gatherings increases the risk of COVID-19 transmission, and may be more likely to occur for extroverted people than introverted people. Therefore, extroversion likely acted as a risk factor for increased spread of COVID-19 due to reduced adherence to social behavior guidelines, and increased stress from social distancing requirements.

III. GOING FORWARD

It is clear that self-identification as introverted or extroverted may have impacted adherence to public health guidance during the pandemic. However, this has not been formally investigated in depth, and was not considered a major factor in development of public health messaging. It is critical to identify and understand how people of different personality types respond to governmental mandates, scientific or medical guidelines, public practice or peer pressure, and public health messaging during normal conditions, and during stressful conditions such as those brought on by the pandemic. By understanding these differences, public health recommendations and messaging can be improved to ensure higher compliance and reduce “risky” behaviors when normal activity is not possible, such as during an outbreak. Indeed, such messaging typically relies on identifying common traits, beliefs, or experiences among viewers and listeners to provide a message capable of reaching the broadest available audience.

However, this practice does not account for the fact that although the behavioral changes needed to prevent the spread of COVID-19 might have been the same for all people, the degree to which these changes needed to be instituted were different depending on personality traits. As discussed above, an extrovert would need to change their social behavior more than an introvert, who may have more limited social interactions to begin with. This may also lead to confusion over whether social behavior has been changed “enough” to comply with guidelines.

As an example, consider messaging which indicates that attendance at social gatherings should be reduced. For an extrovert, this may be interpreted as going to gatherings once a month rather than once a week, whereas for an introvert, this could be interpreted as going to one gathering a year rather than once every three months. In this case, both people tried to comply with the suggested actions, but their interpretation of compliance was biased by their inherent socialization preferences. If instead, the messaging indicated that no gatherings should be attended

until further notice, this could reduce confusion and provide clarity as to the amount of in-person socialization that is acceptable under pandemic conditions. Furthermore, public health guidance should also consider the different mental and emotional needs which may not be met if social behaviors are limited, and how these may vary between types of people. For example, extroverts may feel more stressed by lack of social contact than introverts, meaning that they are more likely to be noncompliant with guidance in order to meet their mental and emotional needs if they feel these needs are unmet and they are not supported. To combat this, more positive messaging (as opposed to restrictive messaging) may be required. Rather than only focusing on what should not be done (i.g. do not gather, do not dine in restaurants), messaging should also include resources and ideas for what can be done. This could include promoting virtual gatherings and providing resources to support this, explaining how to safely meet if it must be done (such as visiting parents in nursing homes by staying outside closed window), and providing transparency as to the decision-making process around when and how to shelter or close down. These positive action-based messages could complement safety messaging by supporting individuals who are more likely to experience emotional stress from outbreak-related restrictions. This could help increase compliance by providing motivation to adhere to guidelines by showing risks and precautions, but also by providing alternatives to “risky” social behaviors for those who identify as extroverted or highly social. Indeed, prosocial language was found to more effective at inducing self-isolation compliance than threatening language, but only when respondents identified as extroverted,²⁸ suggesting that messaging may differ in its effectiveness based on personality traits. While some positive messaging was available during the pandemic, widespread communication occurred primarily for restrictive messaging, such as was distributed in mainstream news outlets and media platforms.

The COVID-19 pandemic has provided a major learning opportunity for us to understand how to better target public health messaging and guidance to individuals. Rather than focusing only on common psychological elements, messaging should also take into account the different responses to guidelines based on social personality

28. Heffner, J., Vives, M. L., & FeldmanHall, O. (2021). Emotional responses to prosocial messages increase willingness to self-isolate during the COVID-19 pandemic. *Pers Individ Dif*, 170, 110420. doi:10.1016/j.paid.2020.110420.

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types. In the future, these principles can also be applied to many different health crises or situations, many of which are influenced by responses to peer pressure and other social factors.

CONCLUSION

This essay sought to examine the idea that promotion of extroverted tendencies by U.S. culture contributed to increased risk of COVID-19 spread, due to reduced adherence to social distancing and other guidelines. Although formal studies have not addressed this possibility in sufficient depth, findings do suggest that extroverts generally experienced more stress and lower compliance with social distancing guidelines or limits on gatherings during the pandemic. Restrictions on social activities would primarily affect extroverts, who tend to thrive on social interaction, while introverts tend to avoid these activities for more individual efforts. Public messaging has traditionally relied on finding psychological commonalities between individuals, in order to best reach a broad target audience. Promotion of positive alternatives to in-person socialization would be beneficial to promote adherence to guidelines. In addition, targeted messaging that accounts for differences in degree of behavioral changes required of extroverts compared to introverts, and the increased stress associated with lack of social contact, could be more successful in inducing compliance with social guidelines issued during this pandemic or any future public health crises.