

# Using psychological science to support social distancing: Tradeoffs between affiliation and disease-avoidance motivations

Steven G. Young<sup>1,2</sup>  | Mitch Brown<sup>3</sup> | Donald F. Sacco<sup>4</sup> 

<sup>1</sup>Baruch College, City University of New York, New York City, New York, USA

<sup>2</sup>The Graduate Center, City University of New York, New York City, New York, USA

<sup>3</sup>University of Arkansas, Fayetteville, Arkansas, USA

<sup>4</sup>The University of Southern Mississippi, Hattiesburg, Mississippi, USA

## Correspondence

Steven G. Young, Baruch College, City University of New York, 55 Lexington Avenue, 10010, New York, USA.  
Email: [steven.young@baruch.cuny.edu](mailto:steven.young@baruch.cuny.edu)

## Funding information

National Science Foundation, Grant/Award Number: 2030914

## Abstract

Humans are an intensely social species with a pervasive need for affiliation and social interaction. However, satisfying this fundamental motive comes with risk, including increased exposure to others' communicable pathogens. Consequently, disease mitigation strategies may require humans to downregulate their interest in socialization when pathogenic threat is elevated. Subsequent unsatisfactorily met affiliation needs can result in downregulation of disease avoidance goals in the service of social inclusion, albeit at the cost of putting individuals at greater risk for pathogen exposure. The current review summarizes past work in social and evolutionary psychology demonstrating affiliation and disease-avoidance motivation tradeoffs. We then apply this research by articulating strategies to support and maintain social distancing behaviors in the face of loneliness, which is of particular importance during pandemic outbreaks such as COVID-19. Finally, we propose novel and integrative research questions related to affiliation/pathogen-avoidance tradeoffs.

## KEYWORDS

applied psychology, belonging, COVID-19, social distancing, technology

## 1 | INTRODUCTION

Humans have a fundamental need for social affiliation (Baumeister & Leary, 1995). In fact, humans have been dubbed an ultrasocial species due to the highly interdependent nature of their relationships and groups (Richerson & Boyd, 1998). Pervasive affiliative motives afford benefits, including access to mates, coalitional support during conflicts, and resource distribution, whereas frustrating them produces various negative outcomes. Social isolation and loneliness are associated with impaired cognitive performance (Baumeister & DeWall, 2005) and reduced well-being (Berkman & Syme, 1979; Cohen & Janicki-Deverts, 2009). The need to belong is so potent that social rejection is even painful when enacted by strangers and inanimate computer programs (Zadro et al., 2004). Individuals further prioritize inclusion over financial rewards, opting to sacrifice monetary gains in exchange for social acceptance (van Beest & Williams, 2006). Collectively, belongingness research makes a compelling case that social inclusion is prioritized above many other motivations, and losing social connections is highly aversive (Williams, 2009).

Social interactions nonetheless pose a risk. Affiliation traditionally requires proximity to others, yet enhanced proximity is a significant factor for disease transmission (Jones et al., 2008). Diseases transmitted via interpersonal contact presented recurrent survival threats throughout evolutionary history (Hubálek & Rudolf, 2011). This adaptive problem ostensibly led to the emergence of a “behavioral immune system,” a set of automatically initiated behaviors (e.g., interpersonal avoidance) designed to reduce contact with diseased individuals (Murray & Schaller, 2016), thereby avoiding the need to enact metabolically costly immunological responses (e.g., fevers). This tension between needing affiliation, yet avoiding disease, requires careful balancing. Sociality's benefits necessarily increase exposure to disease vectors, namely other people. Contrariwise, the motivation to avoid disease requires foregoing the numerous benefits of socialization (Sacco et al., 2014).

Competition between the need to belong and disease avoidance has been starkly revealed as the novel Coronavirus (SARS-CoV-2, i.e., COVID-19) became a global pandemic. The leading recommendation to slow the spread of infectious disease is social distancing or avoiding close physical contact with others, which indeed demonstrates considerable efficacy in reducing infection spread (Fong et al., 2020; Gagnon et al., 2020). This has entailed everything from mandatory stay-at-home orders, school closures, and business shutdowns in some countries to less restrictive government recommendations that rely on voluntary social distancing. COVID-19 social distancing practices have thus varied in restrictiveness and effectiveness (Anderson et al., 2020), yet invariably entail limiting face-to-face social contact to blunt disease spread. A pressing public health dilemma emerges to encourage, support, and maintain social distancing during pandemics while reducing the psychological burdens of isolation. Doing so requires satisfying belongingness motives with alternatives to direct social contact.

Below, we first review research addressing the motivational tension between affiliation and disease avoidance and highlight areas of basic theory testing that will advance this area of study and represent opportunities for interdisciplinary collaboration and theoretical integration of evolutionary and social psychology. We then focus on how these competing motives manifest in responses to the novel coronavirus pandemic and offer practical recommendations for policy-makers, public health practitioners, and citizens alike.

## 2 | CONFLICTING DISEASE AVOIDANCE AND AFFILIATION MOTIVES

Research has recently begun testing how humans balance competing disease avoidance and affiliative motivations (e.g., Sacco et al., 2014; Brown, Medlin, et al., 2019). In one experiment, participants were primed with either image of disease-related stimuli (e.g., infected sores) or negative, disease-irrelevant images (e.g., car crashes) as a control before reporting their need to belong via self-report. Disease-primed participants reported a lower need to belong than control-primed participants (Sacco et al., 2014). Although appearing intuitive, this finding is theoretically unexpected (Williams, 2009) and surprising in light of work, showing belongingness needs are seldom

downregulated (Van Beest & Williams, 2006). Additionally, it underscores the uniqueness of disease threats; other situations that induce fear and anxiety often strengthen affiliation motives, rather than decrease them (Schachter, 1959; Young et al., 2015).

While the work above shows that disease salience reduced affiliative interest in general, additional experimental investigations have explored more nuanced social reactions to disease threats. One troubling finding is that disease salience leads to an especially strong avoidance response toward groups of people deemed “foreign” within a local environment (e.g., Brown, Keefer, et al., 2019; Navarrete & Fessler, 2006), as well as those with physical abnormalities (e.g., facial deformities; Ackerman, Vaughn Becker, et al., 2009) despite neither cue being diagnostic of one's actual pathogenic threat. The reduced interest in social affiliation when disease threats are primed most notably manifests as a downregulated interest in affiliating with unfamiliar people and individuals with stigmatized physical features (e.g., Makhanova et al., 2015; Young et al., 2011).

Such reactions are thought to reflect an adaptive—but socially deleterious—response to disease threats. Indeed, historical examples of disease following contact between unfamiliar peoples are numerous (e.g., Diamond, 1997). When environmental cues prompt disease concerns, this does not merely inspire social withdrawal (e.g., Sacco et al., 2014), but can have larger ripple effects including increased prejudice and discrimination, and a more generalized wariness of unfamiliar “others” that isn't specific to particular outgroups (Navarrete & Fessler, 2006; Petersen, 2017; van Leeuwen & Petersen, 2018). Consequently, the social–psychological impact of disease threats extends beyond the stress imposed on socially isolated individuals but also particularly affects members of marginalized or underrepresented groups. Recent survey research confirms that Asian individuals living in Western nations have experienced increased discrimination during the novel coronavirus pandemic, owing to the first outbreak occurring in China (e.g., Rzymiski & Nowicki, 2020) and increased wariness toward Chinese people among those with chronic pathogen concerns (Goh, 2020), although of course multiple factors likely contribute to this increase in prejudice (e.g., political messaging; see Roberto et al., 2020).

In addition to the intergroup consequences of disease salience, additional research has explored other, more specific outcomes, including avoidance of interpersonal contact and large social gatherings. Individuals reporting chronic concerns about infectious disease report disinterest in extraverted individuals (Brown & Sacco, 2016). This aversion could be advantageous, as extraverts possess extensive social networks and engage in frequent socialization, increasing their likelihood of being carriers of infectious illnesses (Pollet et al., 2011). Epidemiological research further indicates many diseases are not spread equally within populations; specific individuals (so-called “super spreaders”) appear to account for the bulk of disease transmission, in part due to their gregarious and highly social behaviors (Peters et al., 2020). Consequently, avoiding certain highly social individuals when pathogenic threats are heightened may be a functional behavior, albeit one that causes social harm to extraverts in the form of ostracism. Activating disease concerns also makes participants rate themselves as less extraverted and facilitates avoiding novel individuals, which could reduce the social harm experienced by extraverts in pathogenic environments (Mortensen et al., 2010; Sawada et al., 2018). Aside from these interpersonal preference shifts, disease concerns also heighten the wariness of spaces with considerable social interactions (Ackerman & Wang, 2019), while this heightened potential for interpersonal contact (i.e., crowding) fosters greater disease worries (Brown & Sacco, *in press*).

An implication of these results is that social distancing may be tolerable—or even preferable—for individuals genuinely concerned with disease-avoidance during outbreaks, as their fear of contagion reduces their affiliation needs. However, this relation between disease avoidance and affiliation motives is bidirectional. Acute and chronic affiliative motives reduce concerns of disease contraction (Sacco et al., 2014) and increase tolerance for pathogen exposure. Individuals reporting dispositionally heightened need to belong, in addition to those experiencing exclusion, prefer extraverts, whose outgoing and sociable nature makes them ideal new friends despite increased infection risk (Brown, Medlin, et al., 2019; Brown & Sacco, 2017; Brown, Sacco, & Medlin, 2019). Recent evidence has also found a heightened willingness to affiliate with agreeable and honest individuals even when disease risk is high (Tybur et al., 2020). Related research finds social rejection heightens willingness to interact with individuals

with highly asymmetrical faces (Sacco et al., 2014), when pathogenic concern would otherwise heighten aversion to facial asymmetry (Brown & Sacco, in press; Young et al., 2011). This increased tolerance of facial asymmetry occurs despite physical asymmetry being associated with poor immunological functioning (Rhodes, 2006), including increased prevalence of respiratory infection (Thornhill & Gangestad, 2006; see also Pound et al., 2014).

### 3 | FUTURE DIRECTIONS FOR RESEARCH ON AFFILIATION AND DISEASE-AVOIDANCE TRADEOFFS

While the literature on tradeoffs between affiliation and disease-avoidance motivations has developed fairly quickly, there are still numerous important questions yet to be addressed. Here, we review what we consider the most important gaps in the literature. Foremost, understanding how disease-avoidance and affiliation motives interact over extended timeframes requires careful study. Research examining tradeoffs between these motives generally focuses on immediate reactions (e.g., Sacco et al., 2014), leaving unaddressed how prolonged disease salience and social isolation interact.

One approach to addressing this question would be experience-sampling methods, wherein participants provide ongoing measurements of their current disease-avoidance motives and need to belong. Initial outbreak responses would likely inspire voluntary social distancing due to disease avoidance being prioritized over affiliation. However, one might predict pressures to fulfill continuously unmet affiliative needs would begin to outweigh disease-avoidance motives. If so, researchers could consider ways to intervene. This could include providing socialization boosts through reminders to communicate with friends (in ways demonstrating social awareness and enhanced social presence) to stave off encroaching loneliness. Aside from providing useful theory testing, a more longitudinal approach is especially important for understanding how these contrasting motives operate in practical settings (e.g., during global pandemics, but also regional epidemics). Recent papers have urged caution when applying psychological research insights from time-limited experiments to extremely unique social situations like prolonged disease outbreaks (e.g., Ackerman et al., 2020). Accordingly, more considered attention to the time-course of motivational tradeoffs is warranted.

An additional question that warrants more attention includes documenting sociocultural differences in how affiliation and disease-avoidance goals are balanced. Interestingly, research indicates some cultural differences (e.g., collectivist vs. individualistic orientations, see Markus & Kitayama, 1998) are partly attributable to the historical prevalence of pathogens in particular regions across the globe (Fincher et al., 2008). This research suggests collectivistic cultures—which place a strong emphasis on collective well-being, social obligation, self-control, and normative behaviors—are the product of behavioral responses to disease risks that were conveyed through social learning and eventually became entrenched as cultural practices. Consequently, this suggests that in more communally minded cultures engaging in behaviors that avoid ostracism (i.e., adhering to norms) plays a direct role in avoiding diseases as well. This poses the interesting possibility that conflicting affiliation and disease-avoidance motives might be less in conflict in collectivistic cultures. For example, given that social rejection increases susceptibility to normative influence in order to increase the likelihood of reaffiliation (Hales et al., 2017), social rejection may lead to increased engagement in the same normative actions that are designed to ensure cleanliness and health in collectivistic cultures.

Yet, outside of the broad distinction between collective/individualistic culture distinctions, more nuanced differences may impact reactions to affiliation and disease-belonging motives. For example, research has found differences in personal space preferences (Aiello & Thompson, 1980; Baldassare & Feller, 1975). In particular, individuals in the Mediterranean and Latin American cultures commonly interact with less physical distance than is common in Northern Europe, the United States, and Canada (e.g., Beaulieu, 2004). In these cultures, frequent interpersonal closeness and contact naturally increase the risks of disease spread. One would predict as well that experiences of social rejection would increase the desire for physical closeness in members of these cultures (as a

means of reassurance and as gestures of acceptance), which may lead to particularly risky behaviors in the service of satisfying affiliation motives. Similarly, it would be interesting to examine whether activating disease concerns in these cultures downregulates the desire for physical closeness or whether this behavior is so deeply ingrained as to persist under conditions of disease threat. Some theorizing has posited that cultural differences in physical distance preferences correspond to attributions for why a person is closely approaching (e.g., threat vs. reward; see Burgoon & Jones, 1976). Targeting this specific appraisal may be ideal for examining whether disease threats impact how physical closeness is interpreted and preferred across cultures.

Finally, even within cultures, researchers should systematically examine how factors like socioeconomic status (SES) and local population density impact the competition between affiliation and disease avoidance. In practical terms, low-SES individuals and/or those living in densely populated communities likely have fewer options for social distancing or interpersonal avoidance when disease threats are salient (this is discussed in more detail below as a challenge to public health initiatives during pandemics). Yet, it would be interesting to see if other compensatory behaviors are increased (e.g., handwashing, mask-wearing) when disease avoidance motives are active. More generally, recent research has uncovered interesting social psychological impacts of SES (e.g., Mengelkoch & Hill, 2020; Oishi, 2014) and community density (e.g., Evans et al., 1989; Sng & Ackerman, 2020) and we expect that these socioecological variables play a critical role in determining the priority given to affiliation relative to disease avoidance and the strategies employed when one motive is dominant over the other.

#### 4 | CONFLICT BETWEEN DISEASE AVOIDANCE AND AFFILIATION DURING A PANDEMIC

The review above provides a broad and generalized overview of the literature on affiliation and disease-avoidance tradeoffs. This line of research is interesting in its own right (e.g., Sacco et al., 2014). However, the COVID-19 pandemic has vividly provided a real-world demonstration of the conflict between the powerful motives to belong and avoid illness. In light of this, we aim now to provide a timely overview of how theory-driven research on this topic can be leveraged to help support safe behaviors (e.g., social distancing) while reducing the distress caused by isolation and loneliness.

While past research has uncovered numerous psychologically grounded interventions to improve public health outcomes (see Glanz & Bishop, 2010), these have often focused on reducing racial and socioeconomic disparities in health (Came & Griffith, 2018; D. R. Williams, 1997), leveraging social norms to encourage healthy behavior in various domains (e.g., Papiés et al., 2008; Stevens, 2018) and the role of emotions in health-related decision-making (e.g., Witte & Allen, 2000). The present approach complements these efforts by focusing specifically on fundamental human motivations and the tradeoffs inherent to managing the costs and benefits of human sociality. We believe this approach offers a novel and likely generative integration of research on human motivation and public health behavior, and offers particularly valuable insight into behavior during pandemics.

Mitigating the negative consequences of isolation is essential to successful social distancing during pandemics. Since disease salience can prompt voluntary distancing (Sacco et al., 2014; Mortensen, et al., 2010; Sawada et al., 2018), a practical step is therefore clearly and unambiguously communicating the severity of a pandemic illness to the public without inducing panic (e.g., Herrera-Diestra & Meyers, 2019). Doing so requires unified and consistent messaging from public health and governmental agencies (Anderson et al., 2020). Policy-makers have disseminated specific and concrete behavioral recommendations, such as encouraging six feet of physical separation, which have helped ensure populations know how to act with little ambiguity in interpreting the message. However, not all messaging has been so clear. Case in point, ambiguous messaging regarding the effectiveness of mask-wearing has fueled ongoing anti-mask sentiment in some segments of the US population (Taylor & Asmundson, 2021). Now that several vaccines are approved, it becomes vital to craft-consistent messaging about their safety and effectiveness in order to minimize public reticence to inoculation. One interesting way to do this

may be framing vaccines as a means to resume some in-person socializing. In other words, presenting vaccines as a means to satisfy belonging motives safely may be a profitable strategy for reducing infection frequency and severity.

However, the effectiveness of disease salience may be diminished among individuals acutely sensitive to belongingness needs (Sacco et al., 2014). To address this, we turn to the wider literature on human sociality. One notable recent experiment compared the effectiveness of computer-mediated text exchanges (e.g., instant messenger), face-to-face interactions, and no-interaction situations (i.e., control) on mood states and feelings of social belonging (Sacco & Ismail, 2014). Although face-to-face interactions were most satisfying on all dependent measures, text interactions improved mood relative to no-interaction situations. Additional research finds technology-mediated and face-to-face interactions with close friends (rather than novel interaction partners) are equally beneficial for reducing stress and anxiety (Holtzman et al., 2017). Overall, technology-mediated interactions with friends can ease the burden of social distancing, reducing the need for face-to-face interactions. It becomes imperative to convey this information to the public.

Technologically mediated communication nonetheless lacks some aspects of face-to-face socializing (e.g., non-verbal behaviors, physical touch), which can decrease their social value (Bardram & Hansen, 2004). Similarly, it is possible to participate in online chats without a webcam (or with a camera turned off), which likely further decreases feelings of social connectedness. Research has identified that technology-mediated communication best enhances social connectedness and reduces distress when the exchange conveys social awareness (i.e., awareness of recipients' social context and subjective state) and social presence (i.e., being available for, and responsive to, communicative efforts; e.g., Riedl et al., 2013). It is thus equally important to provide evidence-based guidance for how to structure technology-mediated interactions to reduce loneliness or distress. Simply put, text messaging or other interactions (e.g., facetime sessions) need to emphasize reciprocal awareness of each members' social situation and should occur in a manner that avoids long gaps in between exchanges (Caplan & Turner, 2007).

Social distancing efforts may be most challenging and less effective for those who especially prize social interaction. For those skeptical of the severity of a pandemic, social isolation may be viewed as a vexing affront to their need for frequent social interactions (Herrera-Diestra & Meyers, 2019). Distancing may further challenge policy-makers in areas with low-density populations, given the naturally occurring distance between individuals leading to different experiences of a pandemic's virulence. In these cases, the deleterious consequences of social isolation are likely to be especially potent, leading affiliation motives to outweigh disease-avoidant behaviors like voluntary social distancing. Restrictions on social activity could further elicit backfiring effects, whereby individuals engage in more proximity-based affiliative behaviors than in the absence of disease threat, consistent with reactance-based behaviors seen in other domains (see Rosenberg & Siegel, 2018, for a recent review). This is an important topic for researchers and policy-makers to consider going forward. Dismissing health recommendations has previously presented real challenges to public health initiatives (e.g., anti-vaccine movement; Pluviano et al., 2017) and appears similarly deleterious during the present pandemic.

Research also underscores the benefits of companion animals. For example, pets improve well-being on multiple measures (e.g., self-esteem) and reduce the pain of experimentally induced social exclusion (McConnell et al., 2011). Moreover, merely viewing images of cats and dogs alleviates this distress (Brown et al., 2016). A practical implication is that individuals with beloved pets will tolerate social distancing better than those without pets. Interestingly, newspapers report dramatic increases in dog and cat adoptions and fostering during the COVID-19 pandemic, indicating people turn to companion animals to help mitigate the stress of isolation (e.g., Willis, 2020).

One could imagine ways to combine the suggestions above to enhance their effectiveness. For example, sharing photos of pets with friends combines the benefits of technology-mediated interactions with close others (Holtzman et al., 2017) with the benefits of viewing animal pictures (Brown et al., 2016). Additionally, if multiple devices are available, sharing in simultaneous communal activities providing visual cues (e.g., emotional expressions and eye-gaze) of social awareness and social presence are likely to be especially helpful. This latter activity has already become commonplace (e.g., coordinated movie watching; Cuthbertson, 2020), so an interesting question for

researchers is whether these technology-mediated interactions are satisfying belonging needs and actually helping people maintain physical distance from friends and family. This research should attend to various contextual factors—for example, whether webcams are turned or not, or the number of people engaging in shared online activities—to gain a more nuanced understanding of the ideal methods for reducing loneliness through virtual socializing.

## 5 | CHALLENGES AND RECOMMENDATIONS RELEVANT TO POLICY-MAKERS

An especially pressing question is how to convince people to socialize while maintaining social distance (e.g., engaging in exclusively technology-mediated interactions). Doing so requires modifications to normal behavioral routines and may be perceived as less satisfying than “real” social interactions (Sacco & Ismail, 2014). The literature on normative influence, a powerful tool for bringing about behavioral change, could prove helpful (e.g., Cialdini & Goldstein, 2004). Demonstrating targeted behaviors is socially (un)desirable and (un)common among peers, reduces school bullying, increases environmental conservation, and increases voter turnout (House, 2018). Accordingly, public health officials and policy-makers could craft messages to the public demonstrating social distancing is common and encouraged during pandemics. This could be supplemented by communicating failing to social distance is undesirable and that compensatory actions (e.g., frequent technology-mediated communication with friends) are normative and accepted ways of socializing during a pandemic. In the service of ensuring affiliative bonds with group members (Maner et al., 2007), adherence to these protocols could be framed as a form of affiliative experience (K. D. Williams, Cheung, & Choi, 2000).

Though less intuitive than the connection between normative influence and affiliation, similar principles may nonetheless be leveraged when disease-avoidance motives as salient as well. Previous research suggests disease salience fosters a greater interest in conformity and proclivity for normative influence, which is argued to be due to the increased infection risk inherent in non-normative behavior (Murray & Schaller, 2012; Murray et al., 2011). Disease salience could similarly heighten interest in adhering to social norms designed to reduce such infection risks in the context of a pandemic and may also be encouraging individuals to enforce social norms related to disease avoidance, such as mask-wearing or handwashing (Brown & Sacco, 2020). Exact designs of norm-based interventions will need specification, but the unique insight gained from considering motivation tradeoffs is that belongingness motives can be leveraged to increase disease-avoidance behaviors. In such cases, behaviors that benefit public health (e.g., mask-wearing and social distancing) may become commonly accepted not because they reduce disease-spread, but instead because they are critical to social acceptance and rejection avoidance.

### 5.1 | Challenges posed by individual differences

Demographic and personality variables are likely to influence the capacity and willingness to engage in social distancing and/or to derive benefits from virtual forms of socialization, which poses challenges for developing optimally inclusive interventions. Age is likely one such factor. Older adult populations' vulnerability to COVID-19 requires a greater commitment to social distancing. Yet loneliness is particularly damaging for aged populations (e.g., Courtin & Knapp, 2017). Understanding how aged adults balance the risks of disease avoidance with the need for social interaction may inform best practices for facilitating older adults' social distancing while ensuring affiliation satisfaction. Notably, older adults may be relatively unfamiliar with technology-mediated forms of communication (e.g., video chats; Rubenking & Bracken, 2018), which may therefore make it especially difficult for this population to find adequate substitutes for direct face-to-face social interactions. A practical recommendation then is to offer user-friendly information that improves technically savvy amongst older users. Similar evidence programs have been designed to increase computing literacy and access to accurate health information in the senior

population using freely available resources (e.g., Xie, 2012), and these could likely be adopted to increase comfort and skill with technology-mediated forms of communication.

Considering younger adults introduces different variables, including the recently dubbed “fear of missing out” (FOMO). This state involves concerns with being left out of enjoyable social activities that foster interpersonal bonding and is felt more strongly in younger than older individuals (Przybylski et al., 2013). Past research has found that FOMO is positively associated with risk-taking (e.g., heavy social drinking; Riordan et al., 2015). Extrapolating from this work, FOMO may also motivate younger adults to engage in risky socialization behaviors that increase disease spread as a result of prioritizing social affiliation. These suggestions are somewhat speculative but provide useful and important research topics for future study, and may also underscore the need for carefully crafted interventions that target the specific factors that undermined social distancing in older and younger adults (e.g., increased comfort with virtual socialization vs. decreased FOMO).

Additional factors are also worthy of consideration. For example, recent research finds that regional variations in personality traits (e.g., areas with relatively high levels of extraversion at the population level) also experienced intense outbreaks of COVID-19, presumably due to the high levels of frequent and close personal contact within those areas (Nettle, 2005; Peters et al., 2020). More generally, extraverted individuals likely struggle the most with social distancing and are less satisfied with distal forms of socializing, leading to higher levels of social distancing violations. Thus, in addition to tailoring public health campaigns based on audience age, researchers and practitioners would be wise to consider how population-level differences in personality profiles impact the willingness to adhere to social distancing protocols.

## 5.2 | Challenges posed by sociocultural factors

Just as regional differences in personality are likely to impact social distancing behaviors, so too are even broader cultural differences. As noted above, collectivistic cultural practices may themselves be partially attributable to disease threats (Fincher & Thornhill, 2008). If so, then it would be expected that collectivistic cultures would show higher rates of social distancing adherence than individualistic cultures (and other disease-preventative behaviors as well), provided this behavior was framed as (1) normative (2) enhancing collective wellbeing, and (3) fulfilling a social obligation. To date, evidence supports this assertion, as compliance with distancing behaviors has been higher in East Asian cultures than in the West (e.g., Shaw et al., 2020). This may create an interesting situation wherein the need to belong and disease avoidance behaviors can be framed as compatible, for example, by emphasizing social distancing as an act of solidarity and social responsibility. Keeping this information in mind is therefore valuable to public health practitioners working in collectivistic cultures (e.g., portions of China, Japan, etc.) or with immigrant communities in the West that retain collectivistic practices and beliefs.

Extending beyond this distinction between Eastern and Western cultures, additional work has identified the existence of cultural tightness that serves to predict the strength of social norms and tolerance of deviant behavior. Tight cultures, or those that rely heavily on adherence to social norms, frequently emerge in population-dense regions (Gelfand et al., 2011), which heightens pathogen concern from the increased risk of disease transmission (Brown & Sacco, in press; Jones et al., 2008). An understanding of these ecological factors in shaping distinct sociocultural responses to pandemic could be leveraged by researchers by potentially rendering salient population density to identify how it shapes pandemic-related behavior, which could inform how public health officials communicate this density to cultures that experience less tightness. However, in the aforementioned Mediterranean and Latin American cultures where close physical proximity is normative and enjoyed, it may be most important to encourage a temporary abandonment of this behavior by clearly linking physical closeness and contact to increase the risk of disease transmission.

Finally, while this review has focused on the tension between disease avoidance and social belonging motives, it is worth noting other, more practical factors that may affect the success of social distancing



initiatives in the context of pandemics. One such factor is SES. Lower SES is associated with more dense living (e.g., apartments vs. single-family homes), more frequent public transit use, and working in “essential” service industries that require in-person work and social interactions, all leading to increased disease vulnerability (Gray et al., 2020; Patel, et al., 2020). Thus, even if disease-avoidance motives are salient in low-SES communities, the ability to maintain physical separation from others is limited. Similarly, low-SES individuals may also lack high-speed Internet access or other means of engaging in safe, technology-mediated interactions. These constraints place real barriers on the ability to socially distance and engage in technology-mediated forms of socialization (Coroiu et al., 2020). As a consequence, the best practice in these communities is to emphasize alternative behaviors that stem disease transmission, most notably proper mask usage and frequent handwashing. Such approaches would reflect the lived reality of low-SES individuals living in dense and/or technology-limited communities.

## 6 | CONCLUSION

This review of empirical research on the tension between disease-avoidance and affiliation motives was designed to achieve two ends: first, to offer a wide-ranging summary of the research to date on the competition between two fundamental motivations states, and second, to draw on this research in order to make evidence-based recommendations for public health professionals and policy-makers during the COVID-19 pandemic. With respect to the first goal, we also offer future research directions that will advance basic theory regarding motivational tradeoffs. Regarding the second goal, understanding that social distancing initiatives compete against humans' powerful belongingness needs highlights a practical challenge to the success of non-compulsory distancing efforts. Suggestions for encouraging and supporting ongoing social distancing provide practical and evidence-based strategies that could assist in overcoming this challenge, leading to increased success in controlling the spread of contagious diseases. We hope public health researchers and practitioners build on our suggestions to improve social distancing while mitigating the harmful consequences associated with social isolation.

## ACKNOWLEDGMENTS

This research is supported by National Science Foundation RAPID award NSF-2030914. Please address all editorial.

## CONFLICT OF INTEREST

On behalf of all authors, the corresponding author states that there is no conflict of interest.

## ORCID

Steven G. Young  <https://orcid.org/0000-0002-6383-5641>

Donald F. Sacco  <https://orcid.org/0000-0001-6017-5070>

## REFERENCES

- Ackerman, J. M., Vaughn Becker, D., Mortensen, C. R., Sasaki, T., Neuberg, S. L., & Kenrick, D. T. (2009). A pox on the mind: Disjunction of attention and memory in the processing of physical disfigurement. *Journal of Experimental Social Psychology, 45*, 478–485.
- Ackerman, J. M., Tybur, J. M., & Blackwell, A. D. (2020). What role does pathogen-avoidance psychology play in pandemics? *Trends in Cognitive Sciences, 25*, 177–186.
- Aiello, J. R., & Thompson, D. E. (1980). Personal space, crowding, and spatial behavior in a cultural context. In *Environment and culture* (pp. 107–178). Springer.
- Anderson, R. M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T. D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? *The Lancet, 395* (10228), 931–938.
- Baldassare, M., & Feller, S. (1975). Cultural variations in personal space: Theory, methods, and evidence. *Ethos, 3*, 481–503.

- Bardram, J. E., & Hansen, T. R. (2004). The AWARE architecture: Supporting context-mediated social awareness in mobile cooperation. *Proceedings of the 2004 ACM Conference on Computer Supported Cooperative Work*, 192–201.
- Baumeister, R. F., & DeWall, C. N. (2005). The inner dimension of social exclusion: Intelligent thought and self-regulation among rejected persons. *The Social Outcast: Ostracism, Social Exclusion, Rejection, and Bullying*, 53–73.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497–529.
- Beaulieu, C. (2004). Intercultural study of personal space: A case study. *Journal of Applied Social Psychology*, 34, 794–805.
- Berkman, L. F., & Syme, S. L. (1979). Social networks, host resistance, and mortality: A nine-year follow-up study of Alameda county residents. *American Journal of Epidemiology*, 109, 186–204.
- Brown, C. M., Hengy, S. M., & McConnell, A. R. (2016). Thinking about cats or dogs provides relief from social rejection. *Anthrozoös*, 29, 47–58.
- Brown, M., Keefer, L. A., Sacco, D. F., & Bermond, A. (2019). Is the cure a wall? Behavioral immune system responses to a disease metaphor for immigration. *Evolutionary Psychological Science*, 5, 343–356.
- Brown, M., & Sacco, D. F. in press. *How and when crowd salience activates pathogen-avoidant motives*. *Evolutionary Behavioral Sciences*.
- Brown, M., & Sacco, D. F. (2017). Greater need to belong predicts a stronger preference for extraverted faces. *Personality and Individual Differences*, 104, 220–223.
- Brown, M., & Sacco, D. F. (2016). Avoiding extraverts: Pathogen concern downregulates preferences for extraverted faces. *Evolutionary Psychological Science*, 2, 278–286.
- Brown, M., & Sacco, D. F. (2020). Testing the motivational tradeoffs between pathogen avoidance and status acquisition. *Social Psychological Bulletin*, 15(3), 1–22.
- Brown, M., Medlin, M. M., Sacco, D. F., & Young, S. G. (2019). Facing competing motives: Testing for motivational tradeoffs in affiliative and pathogen-avoidant motives via extraverted face preferences. *Evolutionary Psychological Science*, 5, 440–446.
- Brown, M., Sacco, D. F., & Medlin, M. M. (2019). Approaching extraverts: Socially excluded men prefer extraverted faces. *Personality and Individual Differences*, 137, 198–203.
- Burgoon, J. K., & Jones, S. B. (1976). Toward a theory of personal space expectations and their violations. *Human Communication Research*, 2(2), 131–146.
- Came, H., & Griffith, D. (2018). Tackling racism as a "wicked" public health problem: Enabling allies in anti-racism praxis. *Social Science & Medicine*, 199, 181–188.
- Caplan, S. E., & Turner, J. S. (2007). Bringing theory to research on computer-mediated comforting communication. *Computers in Human Behavior*, 23, 985–998.
- Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, 55, 591–621.
- Cohen, S., & Janicki-Deverts, D. (2009). Can we improve our physical health by altering our social networks? *Perspectives on Psychological Science*, 4, 375–378.
- Coroiu, A., Moran, C., Campbell, T., & Geller, A. C. (2020). Barriers and facilitators of adherence to social distancing recommendations during COVID-19 among a large international sample of adults. *PLoS One*, 15(10), e0239795.
- Courtin, E., & Knapp, M. (2017). Social isolation, loneliness and health in old age: a scoping review. *Health & Social Care in the Community*, 25(3), 799–812.
- Cuthbertson, A. (2020). *How to watch films with friends online under lockdown: New generation of apps make social distancing more social*. Independent.
- Diamond, J. (1997). *Guns, germs and steel: The fates of human societies*. Vintage.
- Evans, G. W., Palsane, M. N., Lepore, S. J., & Martin, J. (1989). Residential density and psychological health: The mediating effects of social support. *Journal of Personality and Social Psychology*, 57, 994.
- Fincher, C. L., Thornhill, R., Murray, D. R., & Schaller, M. (2008). Pathogen prevalence predicts human cross-cultural variability in individualism/collectivism. *Proceedings of the Royal Society B: Biological Sciences*, 275(1640), 1279–1285.
- Fong, M. W., Gao, H., Wong, J. Y., Xiao, J., Shiu, E. Y., Ryu, S., & Cowling, B. J. (2020). Nonpharmaceutical measures for pandemic influenza in nonhealthcare settings-social distancing measures. *Emerging Infectious Diseases*, 26.
- Gagnon, L., Lloyd, J., & Gagnon, S. (2020). Social distancing causally impacts the spread of SARS-CoV-2: A US nationwide event study. *MedRxiv*.
- Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., & Yamaguchi, S. (2011). Differences between tight and loose cultures: A 33-nation study. *Science*, 332(6033), 1100–1104.
- Glanz, K., & Bishop, D. B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health*, 31, 399–418.

- Gray, D. M., Anyane-Yeboah, A., Balzora, S., Issaka, R. B., & May, F. P. (2020). COVID-19 and the other pandemic: Populations made vulnerable by systemic inequity. *Nature Reviews Gastroenterology & Hepatology*, 17, 1–3.
- Goh, J. X. (2020). Perceived vulnerability to disease predicts restrictive policy supports in response to the 2019-nCoV outbreak. *Preprint available at PsyArxiv*.
- Hales, A. H., Ren, D., & Williams, K. D. (2017). Protect, correct, and eject: Ostracism as a social influence tool. In S.G. Harkins, K.D. Williams, & J. Burger (Eds.), *The Oxford handbook of social influence* (pp. 205–217). Oxford University Press.
- Herrera-Diestra, J. L., & Meyers, L. A. (2019). Local risk perception enhances epidemic control. *PLoS One*, 14.
- Holtzman, S., DeClerck, D., Turcotte, K., Lisi, D., & Woodworth, M. (2017). Emotional support during times of stress: Can text messaging compete with in-person interactions? *Computers in Human Behavior*, 71, 130–139.
- House, B. R. (2018). How do social norms influence prosocial development? *Current Opinion in Psychology*, 20, 87–91.
- Hubálek, Z., Kříž, B., & Halouzka, J. (2011). Serologic survey of humans for flavivirus west nile in Southern Moravia (Czech Republic). *Central European Journal of Public Health*, 19, 131–133.
- Hubálek, Z., & Rudolf, I. (2011). *Microbial zoonoses and sapronoses*. Springer Science & Business Media B.
- Jones, K. E., Patel, N. G., Levy, M. A., Storeygard, A., Balk, D., Gittleman, J. L., & Daszak, P. (2008). Global trends in emerging infectious diseases. *Nature*, 451, 990–993.
- Makhanova, A., Miller, S. L., & Maner, J. K. (2015). Germs and the out-group: Chronic and situational disease concerns affect intergroup categorization. *Evolutionary Behavioral Sciences*, 9, 8–19.
- Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (2007). Does social exclusion motivate interpersonal reconnection? Resolving the "porcupine problem". *Journal of Personality and Social Psychology*, 92(1), 42.
- Markus, H. R., & Kitayama, S. (1998). The cultural psychology of personality. *Journal of Cross-Cultural Psychology*, 29, 63–87.
- McConnell, A. R., Brown, C. M., Shoda, T. M., Stayton, L. E., & Martin, C. E. (2011). Friends with benefits: On the positive consequences of pet ownership. *Journal of Personality and Social Psychology*, 101, 1239–1252.
- Mengelkoch, S., & Hill, S. E. (2020). Early life disadvantage, phenotypic programming, and health disparities. *Current Opinion in Psychology*, 32, 32–37.
- Mortensen, C. R., Becker, D. V., Ackerman, J. M., Neuberg, S. L., & Kenrick, D. T. (2010). Infection breeds reticence. *Psychological Science*, 21, 440–447.
- Murray, D. R., & Schaller, M. (2012). Threat(s) and conformity deconstructed: Perceived threat of infectious disease and its implications for conformist attitudes and behavior. *European Journal of Social Psychology*, 42, 180–188.
- Murray, D. R., & Schaller, M. (2016). The behavioral immune system. *Advances in Experimental Social Psychology*, 53, 75–129.
- Murray, D. R., Trudeau, R., & Schaller, M. (2011). On the origins of cultural differences in conformity: Four tests of the pathogen prevalence hypothesis. *Personality and Social Psychology Bulletin*, 37, 318–329.
- Navarrete, C. D., & Fessler, D. M. T. (2006). Disease avoidance and ethnocentrism: The effects of disease vulnerability and disgust sensitivity on intergroup attitudes. *Evolution and Human Behavior*, 27, 270–282.
- Nettle, D. (2005). An evolutionary approach to the extraversion continuum. *Evolution and Human Behavior*, 26, 363–373.
- Oishi, S. (2014). Socioecological psychology. *Annual Review of Psychology*, 65, 581–609.
- Papies, E. K., Stroebe, W., & Aarts, H. (2008). Understanding dieting: A social cognitive analysis of hedonic processes in self-regulation. *European Review of Social Psychology*, 19, 339–383.
- Patel, J. A., Nielsen, F. B. H., Badiani, A. A., Assi, S., Unadkat, V. A., Patel, B., Ravindrane, R., & Wardle, H. (2020). Poverty, inequality and COVID-19: The forgotten vulnerable. *Public Health*, 183, 110–111.
- Peters, H., Götz, F., Ebert, T., Müller, S. R., Jason, P., Rentfrow, S. D., ... Matz, S. C. (2020). Regional personality predicts the early spread of COVID-19 and social distancing. *Nature*, 582, 389–394.
- Petersen, M. B. (2017). Healthy out-group members are represented psychologically as infected in-group members. *Psychological Science*, 28, 1857–1863.
- Pollet, T. V., Roberts, S. G. B., & Dunbar, R. I. M. (2011). Extraverts have larger social network layers. *Journal of Individual Differences*, 32, 161–169.
- Pound, N., Lawson, D. W., Toma, A. M., Richmond, S., Zhurov, A. I., & Penton-Voak, I. S. (2014). Facial fluctuating asymmetry is not associated with childhood ill-health in a large British cohort study. *Proceedings of the Royal Society B: Biological Sciences*, 281, 20141639.
- Pluviano, S., Watt, C., & Della Sala, S. (2017). Misinformation lingers in memory: failure of three pro-vaccination strategies. *PLoS One*, 12(7), e0181640.
- Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior*, 29, 1841–1848.
- Rhodes, G. (2006). The evolutionary psychology of facial beauty. *Annual Review of Psychology*, 57, 199–226.

- Richerson, P. J., & Boyd, R. (1998). The evolution of human ultra-sociality. In I. Eibl-Eibesfeldt & F. Salter (Eds.), *Indoctrinability, Ideology, and Warfare: Evolutionary Perspectives*, 71–95. Berghahn.
- Riedl, C., Köbler, F., Goswami, S., & Krcmar, H. (2013). Tweeting to feel connected: A model for social connectedness in online social networks. *International Journal of Human-Computer Interaction*, 29, 670–687.
- Riordan, B. C., Flett, J. A., Hunter, J. A., Scarf, D., & Conner, T. S. (2015). Fear of missing out (FoMO): The relationship between FoMO, alcohol use, and alcohol-related consequences in college students. *Annals of Neuroscience and Psychology*, 2, 1–7.
- Roberto, K. J., Johnson, A. F., & Rauhaus, B. M. (2020). Stigmatization and prejudice during the COVID-19 pandemic. *Administrative Theory and Praxis*, 42, 364–378.
- Rosenberg, B. D., & Siegel, J. T. (2018). A 50-year review of psychological reactance theory: Do not read this article. *Motivation Science*, 4(4), 281.
- Rubeking, B., & Bracken, C. C. (2018). Binge-watching: A suspenseful, emotional, habit. *Communication Research Reports*, 35(5), 381–391.
- Rzymiski, P., & Nowicki, M. (2020). COVID-19-related prejudice towards Asian medical students: A consequence of SARS-CoV-2 fears in Poland. *Journal of Infection and Public Health*.
- Sacco, D. F., & Ismail, M. M. (2014). Social belongingness satisfaction as a function of interaction medium: Face-to-face interactions facilitate greater social belonging and interaction enjoyment compared to instant messaging. *Computers in Human Behavior*, 36, 359–364.
- Sacco, D. F., Young, S. G., & Hugenberg, K. (2014). Balancing competing motives. *Personality and Social Psychology Bulletin*, 40, 1611–1623.
- Sawada, N., Auger, E., & Lydon, J. E. (2018). Activation of the behavioral immune system: Putting the brakes on affiliation. *Personality and Social Psychology Bulletin*, 44, 224–237.
- Schachter, S. (1959). *The psychology of affiliation: Experimental studies of the sources of gregariousness*. Stanford University Press.
- Shaw, R., Kim, Y.-k., & Hua, J. (2020). Governance, technology and citizen behavior in pandemic: Lessons from COVID-19 in East Asia. *Progress in Disaster Science*, 6, 100090.
- Sng, O., & Ackerman, J. M. (2020). Too many people, women, men? The psychological effects of population density and sex ratio. *Current Opinion in Psychology*, 32, 38–42.
- Stevens, E. M. (2018). What's so appealing? An examination of emotional appeals and viewer engagement in safe-sex PSAs and condom advertisements. *Health Marketing Quarterly*, 35, 18–31.
- Taylor, S., & Asmundson, G. J. (2021). Negative attitudes about facemasks during the COVID-19 pandemic: The dual importance of perceived ineffectiveness and psychological reactance. *PLoS One*, 16(2), e0246317.
- Thornhill, R., & Gangestad, S. W. (2006). Facial sexual dimorphism, developmental stability, and susceptibility to disease in men and women. *Evolution and Human Behavior*, 27, 131–144.
- Tybur, J. M., Lieberman, D., Fan, L., Kupfer, T. R., & de Vries, R. E. (2020). Behavioral immune trade-offs: Interpersonal value relaxes social pathogen avoidance. *Psychological Science*, 31, 1211–1221.
- Van Beest, I., & Williams, K. D. (2006). When inclusion costs and ostracism pays, ostracism still hurts. *Journal of Personality and Social Psychology*, 91, 918–928.
- Van Leeuwen, F., & Petersen, M. B. (2018). The behavioral immune system is designed to avoid infected individuals, not outgroups. *Evolution and Human Behavior*, 39, 226–234.
- Wang, I. M., & Ackerman, J. M. (2019). The infectiousness of crowds: Crowding experiences are amplified by pathogen threats. *Personality and Social Psychology Bulletin*, 45, 120–132.
- Williams, D. R. (1997). Race and health: Basic questions, emerging directions. *Annals of Epidemiology*, 7, 322–333.
- Williams, K. D. (2009). Chapter 6 ostracism. *Advances in Experimental Social Psychology*, 41, 275–314.
- Williams, K. D., Cheung, C. K. T., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the internet. *Journal of Personality and Social Psychology*, 79, 748–762.
- Willis, H. (2020). *Isolated by a pandemic, people are stepping up to foster pets*. U. S. News and World Report.
- Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior*, 27, 591–615.
- Xie, B. (2012). *Improving older adults' e-health literacy through computer training using NIH online resources* (Vol. 34, pp. 63–71). Library & Information Science Research.
- Young, S. G., Sacco, D. F., & Hugenberg, K. (2011). Vulnerability to disease is associated with a domain-specific preference for symmetrical faces relative to symmetrical non-face stimuli. *European Journal of Social Psychology*, 41, 558–563.
- Young, S. G., Slepian, M. L., & Sacco, D. F. (2015). Sensitivity to perceived facial trustworthiness is increased by activating self-protection motives. *Social Psychological and Personality Science*, 6, 707–713.

Zadro, L., Williams, K. D., & Richardson, R. (2004). How low can you go? Ostracism by a computer is sufficient to lower self-reported levels of belonging, control, self-esteem, and meaningful existence. *Journal of Experimental Social Psychology*, 40(4), 560–567.

## AUTHOR BIOGRAPHIES

**Steven G. Young** is an Associate Professor of Psychology at Baruch College, City University of New York (CUNY). He is also a member of the Basic and Applied Social Psychology and Comparative and Cognitive Psychology doctoral programs at the Graduate Center, CUNY.

**Mitch Brown** is an instructor in Psychology at University of Arkansas. His research primarily addresses various motivational tradeoffs humans employ when making survival and reproductive decisions, primarily focusing on the interplay of pathogen-avoidant and affiliative motives. Another avenue of his work considers the selection of long- and short-term mates based on physical and behavioral cues of their reproductive value.

**Dr. Donald Sacco** is an Associate Professor of social psychology at the University of Southern Mississippi. Using the lenses of evolutionary and social psychology, his work explores such topics as motivation, personality, and face perception.

**How to cite this article:** Young SG, Brown M, Sacco DF. Using psychological science to support social distancing: Tradeoffs between affiliation and disease-avoidance motivations. *Soc Personal Psychol Compass*. 2021;1–13. <https://doi.org/10.1111/spc3.12597>