



Pathogen disgust and interpersonal personality



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ABSTRACT

The behavioral immune system includes motivational systems for avoiding contact with pathogens, including those transmitted by other people. Motivations to avoid others may depend not only on the perceived risk of infection but also on perceived benefits of social interaction. Based on this idea, we hypothesise that more agreeable people may experience less disgust towards other people, but not necessarily less disgust towards other pathogen sources. Using two existing samples, we tested whether agreeableness and other personality factors related more to disgust towards human than non-human pathogen cues. As predicted, agreeableness negatively correlated with disgust towards human pathogen cues but not with disgust towards non-human pathogen cues. In contrast, extraversion had no relation with disgust towards human or non-human pathogen cues. These findings suggest that disgust felt towards others may reflect a trade-off between pathogen avoidance and the preferred quality of interpersonal relationships, but not the preferred quantity of relationships. Implications of these findings for understanding the relation between disgust and interpersonal attitudes and behaviours are discussed.

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1. Introduction

The idea that disgust functions to motivate people to avoid infectious stimuli is widely accepted (Curtis & Biran, 2001; Oaten, Stevenson, & Case, 2009). This is why objects that are most likely to harbour pathogens, like rotten meat or feces, elicit disgust across cultures (Curtis, Aunger, & Rabie, 2004). The avoidance of potentially pathogenic objects is not without costs, though. For example, when the source of potential infection is a fellow human, a strong disgust response could jeopardize opportunities for beneficial social interaction. People may thus experience less disgust towards pathogen cues emanating from a person if they anticipate or depend on benefits of positive social interactions. Interpersonal pathogen disgust, therefore, may not depend only on the perceived level of threat from pathogen transmission, but on a trade-off between the costs and benefits of contact (Tybur, Lieberman, Kurzban, & DeScioli, 2013). The primary aim of this paper was to investigate how agreeableness – a personality trait related to the tendency to have harmonious interpersonal contacts – relates to disgust sensitivity towards pathogen cues on other people. Although extraversion also influences interpersonal behaviour, it reflects a preference for a high quantity of social interactions, rather than for high quality and harmonious encounters. For this reason, we expect that agreeableness – rather than extraversion – should relate to interpersonal disgust.

1.1. Pathogen disgust and expected value of contact

The level of disgust experienced depends not only on perceived infectiousness, but also on perceived benefits of physical contact with the stimulus. Experienced disgust can be viewed as an integration of these costs and benefits – what can be thought of as a motivational state reflecting expected value of contact (Tybur et al., 2013). The expected value of contact for a food, for example, would depend on perceived infectiousness of the food (e.g., via odors, colors, or textures associated with decay), a person's nutritional state (e.g., sated versus starving), and the food's perceived nutritional benefits. To a particularly hungry person, even mouldy corn might become palatable (Hoefling et al., 2009). This logic also applies to disgust towards people. Consider parent-offspring interactions. The sight and smell of feces are typically treated as pathogen cues, but parents feel little-to-no disgust towards their own baby's diaper, presumably because the benefits of contact with offspring outweigh the costs of contact with pathogens (Case, Repacholi, & Stevenson, 2006). As a final example, the benefits of contact with a high quality mate may outweigh potential infection costs, resulting in low (and perhaps absent) disgust towards potentially infectious behaviours like kissing and intercourse (Borg & de Jong, 2012).

Of course, the benefits of physical contact extend beyond offspring care and mating. Many social interactions require physical contact or close proximity. Since the avoidance and rejection associated with disgust impair harmonious social interaction, disgust experienced towards people with pathogen cues should reflect a trade-off between the likelihood of pathogen transmission and the benefits of interaction. The estimated benefits of interaction might be sensitive to a variety of factors,

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including the nature of the relationship, the individual's current need for affiliative or collaborative behaviour, the trustworthiness of the target, and the target's ability to confer benefits. Importantly, some of these factors might covary with personality traits such as social trust, empathy, and agreeableness, which index expected benefits from social interaction. Indeed, one recent study found that people high in generalised social trust reported lower pathogen disgust sensitivity (Aarøe, Osmundsen, & Petersen, 2016) measured using the Three Domain Disgust Scale (Tybur, Lieberman, & Griskevicius, 2009).

If this account is correct, then traits like dispositional trust (which reflects how much a person values social interactions), should relate to the level of disgust a person feels towards another individual displaying pathogen cues, but not the level of disgust felt towards a non-human pathogen cue, such as spoiled food. For similar reasons, Gangestad and Grebe (2014) suggested that disgust sensitivity towards human and non-human contaminants might differentially relate to interpersonal psychology, and Park (2015) found that human (but not non-human) pathogen disgust sensitivity predicted preferences for interpersonal space. Following these authors, the current study examines how personality relates to human and non-human item clusters from the Three Domain Disgust Scale (Tybur et al., 2009).

1.2. Pathogen disgust and interpersonal personality

Of the five (in the Big Five) or six (in the HEXACO) higher order personality factors, extraversion and agreeableness most clearly relate to social interaction. Whereas both personality factors influence social motivation, they do so in different ways: Extraversion relates to the preferred quantity of social interaction, whereas agreeableness relates to the preferred quality of social interaction (Costa, McCrae, & Dye, 1991). Hence, we consider each in turn.

1.2.1. Agreeableness

Personality researchers generally view agreeableness as the degree to which a person values harmonious and cooperative interpersonal interaction (Costa et al., 1991; Graziano, Habashi, Sheese & Tobin, 2007). Research has shown that agreeableness predicts more generous, cooperative and trusting behavior in economic games (Zhao & Smillie, 2015), including the dictator game and the prisoner's dilemma (Kagel & McGee, 2014). Agreeableness is also associated with real-world prosocial behaviours like helping strangers (Ozer & Benet-Martinez, 2006) and with efforts to avoid hostile interactions (Jensen-Campbell & Graziano, 2001). More agreeable people are also less likely to be prejudiced and hostile towards the targets of stigma, including obese people (Graziano, Bruce, Sheese & Tobin, 2007) and foreigners (Sibley & Duckitt, 2008). And perhaps of most relevance to the current investigation, agreeable people make more of an effort to control negative emotions when interacting with others (Meier & Robinson, 2004; Tobin, Graziano, Vanman, & Tassinari, 2000).

These lines of evidence suggest that the tendency to experience other-condemning and avoidant emotions like disgust might depend on a person's level of agreeableness. Low agreeableness individuals might discount the value of positive interactions with others in favor of avoiding pathogens. High agreeableness individuals, on the other hand, might have a higher threshold for experiencing disgust towards another person.

1.2.2. Extraversion

Existing work also suggests that pathogen-avoidance motivation should relate to the personality factor extraversion. Social interaction entails the risk of infection, so more pathogen-avoidant individuals may decrease their motivation for social interaction to reduce the frequency of contact with other people (Fincher & Thornhill, 2012). In support of this account, Schaller and Murray (2008) found that people in countries with more infectious disease are less extraverted. In an experimental study, Mortensen, Becker, Ackerman, Neuberg, and Kenrick

(2010) found that participants rated themselves as lower in openness, agreeableness and extraversion after being exposed to pathogen cues.

Similar logic suggests that more disgust sensitive people, being relatively more motivated to avoid infection, might perceive social interaction as more costly and hence be less gregarious and extraverted (Schaller & Park, 2011). However, existing studies have not found a consistent relationship between pathogen disgust sensitivity and extraversion (Olatunji et al., 2012; Tybur, Bryan, Lieberman, Caldwell Hooper, & Merriman, 2011; Tybur & de Vries, 2013). Gangestad and Grebe (2014) investigated disgust sensitivity towards human and non-human pathogen items separately and found a *positive* relation between extraversion and human pathogen disgust but not non-human pathogen disgust. They interpreted this pattern as suggesting that extraverted people experience greater disgust towards human pathogen cues as a protective response to more frequent exposure to conspecifics. An additional aim of the current paper, therefore, was to investigate the relationship between extraversion and disgust sensitivity towards human and non-human pathogen cues.

1.3. Predictions

Whereas previous studies have not found a consistent relation between agreeableness and pathogen disgust (Olatunji et al., 2012; Tybur et al., 2011; Tybur & de Vries, 2013), we predicted that NEO-PI agreeableness would be negatively correlated with human pathogen disgust but not with non-human pathogen disgust, since non-human contaminants do not require a trade-off between pathogen avoidance and harmonious social interaction. In addition, we expected that human pathogen disgust would be most strongly related to the NEO-PI agreeableness facets of trust, tendermindedness and altruism, because these traits are most closely related to a person's motivation to have harmonious and cooperative relationships. We also expected the warmth facet from extraversion (e.g., "I really like most people I meet") to negatively correlate with interpersonal pathogen disgust, due to the prosocial nature of this facet.

NEO agreeableness is distributed between the emotionality, agreeableness and honesty-humility factors of HEXACO (Ashton & Lee, 2007; Ashton, Lee, & de Vries, 2014). Nevertheless, we expected consistent findings: agreeableness, especially the forgiveness, gentleness and patience facets, would negatively correlate with human pathogen disgust but not with non-human pathogen disgust.

We did not make specific predictions regarding the remaining personality factors, but we did seek to test whether they differentially relate to human and non-human pathogen disgust sensitivity.

2. Method

We tested our predictions using data from two existing samples that both measured disgust sensitivity with the Three-Domain Disgust Scale (TDDS; Tybur et al., 2009). The TDDS measures three types of disgust sensitivity, moral, sexual and pathogen disgust, using items rated on a scale from 0, "not at all disgusting", to 6 "extremely disgusting". Following Gangestad and Grebe (2014) and Park (2015), we separated the seven pathogen disgust items into two conceptually distinct clusters: one with three items relating to non-human disgust items (e.g. "stepping in dog poop"), and one with four human disgust items, (e.g. "standing close to a person who has body odor"). We tested how each cluster related to all personality factors and facets.

In the first sample (Tybur et al., 2011), 477 undergraduate students (67.7% female; $M_{age} = 19.89$, $SD_{age} = 3.06$) from the University of New Mexico completed personality assessments using the NEO Personality Inventory (NEO PI-3; McCrae, Costa, & Martin, 2005). The NEO PI-3 measures neuroticism, extraversion, openness, agreeableness and conscientiousness factors, with 48 items per factor. Each factor further breaks down into six eight-item facets, giving a total of 30 facets.

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