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ORIGINAL PAPER

Disgustingly perfect: An examination of disgust, perfectionism, and gender

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Abstract

High levels of disgust and perfectionism co-exist in some clinical disorders raising questions about the relationship between the two. This research evaluated socially-related and physically-related disgust in people with varying levels of perfectionism. In Study 1, 120 college students participated in a state emotion-eliciting scenario task, then completed both the *Almost Perfect Scale-Revised* and the *Three Dimensions of Disgust Survey* (*TDDS*). In Study 2, 380 Qualtrics users completed the scenarios, along with the TDDS and *Multidimensional Perfectionist Scale*. Both studies showed that state emotions differed from each other in ways that were unrelated to perfectionism. Gender differences were seen in the perfectionist groups, state disgust responses, and trait sexual disgust. However, Study 2 also showed relationships between trait perfectionism and disgust. The differing state emotional responses show that contextual interpersonal factors are highly important in disgust behaviors. Additionally, the findings suggest that gender could be important in the relationship between disgust and perfectionism.

Keywords Disgust · Gender · Perfectionism · Emotion

Disgust is an adaptive, basic emotion that is elicited when a person encounters something potentially infectious or harmful to the body (Tybur et al., 2009). Because disgust is elicited to protect the self, it is important to understand what factors motivate people to overcome the emotion in potentially harmful situations. Most everyone experiences situational disgust, but some people are more susceptible to it (Rozin et al., 2000), showing trait differences in this emotion. The collection of specific traits that people have can contribute to their behavior, as can individual differences, such as gender; people may also look to the environment to disambiguate their experiences (Barrett, 2006). The current research seeks to examine reactions to situational disgust by looking at the traits of disgust and perfectionism, as well as gender.

Disgust sensitivity coexists with perfectionism in some psychological disorders, such as eating disorders, obsessive compulsive disorder (OCD; Olatunji & Sawchuk, 2005; Teachman; 2006), and post-traumatic stress disorder (PTSD; Badour et al., 2012). Notably, some of these disorders are more common in female than male individuals (e.g., Kornfield et al., 2018), showing potential gender differences. Gender refers to cultural and social attitudes that together shape and sanction "feminine" and "masculine" behaviors, products, and self-knowledge (http://genderedinnovations.stanford.edu/terms/distinct.html). To our knowledge, the connections between disgust, perfectionism, and gender have yet to be explored.

Disgust

Disgust is conceptualized as a multi-factorial emotion that has been observed cross-culturally (Olatunji et al., 2009). Although there is a measure of consistency as to stimuli (e.g., feces) that elicit disgust (Curtis, & Biran, 2001) across cultures, the experience of disgust can change as a result of the environment in which the stimuli is experienced (Batres & Perrett, 2020); situations that are perceived as more harsh and physically challenging diminish perceptions of disgust so that limited resources can be consumed. The emotion of disgust is also influenced by some demographic factors, such as age, with younger people experiencing more disgust than older individuals (Quigley et al., 1997).

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Disgust has been described by two main models. The traditional model (Rozin et al., 2000) views the dimensions of disgust as core, interpersonal, animal-reminder, and moral; the functional model (Tybur et al., 2009) highlights elements of pathogen, sexual, and moral disgust. The traditional and functional models agree in a number of ways; disgust with potentially contaminating agents (i.e., core disgust; Tybur et al., 2009; Olatunji et al., 2008) and with the violation of social norms (i.e., moral disgust; Tybur et al., 2013) are part of both models. However, the models differ in terms of a social component known as interpersonal disgust. In the functional model, interpersonal disgust is a sub-category of pathogen disgust and relates to contamination of the physical self in that it is elicited by contact with strangers or people associated with diseases (Tybur et al., 2013). In contrast, interpersonal disgust is a separate category in the traditional model that emphasizes the importance of social affiliations; it is often elicited by contact with unknown, sickly, or misfortunate people (Olatunji et al., 2008). Thus, interaction with seemingly contaminated people is considered a disgust elicitor in both models, but with different underlying motivations (either to protect the self or to protect social order).

An examination of the way that people perform when they encounter interpersonal disgust and exploration of whether differences in traits contribute to those behaviors offers the opportunity to differentiate between theoretical frameworks. Psychological disorders also give some evidence to this end. While core disgust is one of the most prevailing characterizations of obsessive-compulsive disorder (OCD) and eating disorders (Olatunji & Sawchuk, 2005), socially-orientated types of disgust (moral and interpersonal) are associated with post-traumatic stress disorder (PTSD; Badour et al., 2012). Thus, sensitivity to different types of disgust seem to be associated with different symptomologies or maladaptive behaviors, potentially indicating that trait differences are related to situational reactions.

Women have generally higher levels of disgust than men (Fessler et al., 2004; Tybur et al., 2011; Quigley et al., 1997), particularly in terms of core (pathogen) and sexual disgust (Al-Shawaf et al., 2018); this gender difference has also been demonstrated in disgust-related psychological disorders (Connolly et al., 2008). For example, in samples of people with OCD, women reported more cleaning obsessions and contamination compulsions than men (Labad et al., 2008; Mathis et al., 2011). Women also have higher diagnostic rates of both eating disorders (Galmiche et al., 2019) and PTSD diagnoses (Tolin & Foa, 2006). Thus, there is seemingly an association between gender and trait disgust that may contribute to the elicitation of disgust emotions. Could other traits or individual differences also contribute to the experience of disgust?

Perfectionism

Like disgust, perfectionism is multidimensional, present in some psychological disorders, and has been described by several models. The multidimensional framework (Hewitt et al., 1991) divides perfectionism into three dimensions: Self-oriented (driven by self set expectations), socially-prescribed (motivated by the belief that others expect perfection), and other-oriented (expecting others to be perfect). In a variant of this framework, the self-oriented and socially-prescribed dimensions have been categorized as adaptive and maladaptive forms of perfectionism, respectively, and thus, create a two dimensional model (Frost et al., 1993). Although there may be others, one way of differentiating adaptive and maladaptive perfectionism is the presence of discrepancy, which is found in people who have high expectations but do not recognize if their behaviors match those standards (Slaney et al., 2001). High levels of discrepancy encompass many negative components of perfectionism and thus identify maladaptive perfectionists.

Similarly to disgust, variations in perfectionism are also present in the literature concerning OCD, eating disorders, and PTSD (Egan et al., 2014; Egan et al., 2011; Frost & Steketee, 1997). People with OCD or eating disorders have been identified as having high personal standards (i.e., self-orientated and adaptive perfectionism[1]; Egan et al., 2011) and are highly sensitive to core disgust (Olatunji & Sawchuk, 2005); whereas, those with PTSD are more prone to suffer from concerns over mistakes (i.e., socially-prescribed and maladaptive perfectionism; Egan et al., 2014) and to social (other-focused) disgust (Badour et al., 2012). Additionally, theoretical considerations of OCD suggest that the traits of perfectionism and disgust are linked, such that cognitions of perfection can cause dichotomous thinking regarding cleanliness (i.e., the object is completely clean, or completely dirty) leading to an inability to tolerate even mildly disgusting stimuli (Teachman, 2006).

Like disgust, some gender differences have been pointed out in perfectionism. Women seem to be more likely to show perfectionism than men (Elison & Partridge, 2012), though this may differ between types of perfectionism. For example, it has been shown that men scored significantly higher on other-oriented perfectionism than women (Hill et al., 1997), and that men who were self-oriented perfectionists were more likely than women to have an assured-dominant personality trait (Stoeber et al., 2021). Women are also more likely to experience Social Physique Anxiety that is influenced by maladaptive perfectionism (Haase et al., 2002).

[1] The term adaptive here strictly refers to the category of perfectionism and does not suggest that perfectionist standards associated with OCD and eating disorders are adaptive.

Self vs. social motivations

Concerns about the self as opposed to the social environment seem to characterize types of disgust and types of perfectionism. The elements describing maladaptive perfectionism are socially motivated in that the desire to achieve high accolades are rooted in expectations from other people, close relationships (e.g., parents), or broader societal standards. Given maladaptive perfectionists' sensitivity to social influences, these individuals may be motivated to maintain or protect social orders. Thus, maladaptive perfectionists might be particularly sensitive to interpersonal and moral disgust, as these types of disgust are elicited to protect social regulations. In contrast, adaptive perfectionists are self-motivated to set high standards for themselves (Frost et al., 1993). Adaptive perfectionists are highly motivated by internal processes; thus, it is possible that adaptive perfectionists are particularly sensitive to offensive stimuli that might disrupt internal functions and the self. Thus, adaptive perfectionists might be particularly sensitive to core disgust, as this emotion is meant to regulate and protect the physical self. Furthermore, self-motivated perfectionism and disgust are associated with the similar psychological disorders (eating disorders and OCD), while socially-relevant perfectionism and disgust are associated with PTSD (Olatunji & Sawchuk, 2005; Teachman, 2006; Badour et al., 2012). When taken together, these observations raise questions as to whether differences in perfectionism are related to the experience of disgust.

Current research

The current research aims to address associations between disgust and perfectionism, as well as the models associated with them, by examining both traits and state responses to disgust-inducing stimuli across two studies that employed different metrics for perfectionism. In each case, participants evaluated 32 brief scenarios that were designed to elicit specific types of situational disgust or anger, then completed questionnaires that evaluated the traits of perfectionism and disgust, as well as demographics.

In both studies, it was predicted that people with maladaptive perfectionist traits (socially-motivated perfectionism) would respond more quickly to avoid scenarios eliciting moral and/or interpersonal disgust (i.e., social-contamination), while those with adaptive (self-oriented) perfectionist traits would respond more rapidly to avoid core/pathogen disgust (i.e., self-contamination) compared to other types of disgust. The prediction that disgust reactions should differ are based on the traditional model (Rozin et al., 2000) of disgust (i.e., interpersonal functions socially, rather than in the same way as the core). By comparing interpersonal disgust reactions to core and moral disgust reactions, the present studies aim to provide insight for disgust modeling and theoretical framework. In addition to these hypotheses, participant gender was considered as a potentially important variable, since women seem to have been reported to have higher levels of both perfectionism (Elison & Partridge, 2012) and disgust (Connolly et al., 2008).

Study 1

The present study examined the Frost et al. (1993) concept of adaptive and maladaptive perfectionism in relation to state and trait disgust, while taking into account participant gender. The study used the *Almost Perfect Scale- Revised* (APS-R) to clearly delineate between perfectionists with high standards that recognize their successes (adaptive) and people with the high standards that feel they have not been successful (maladaptive).

Two types of disgust (state and trait) were evaluated in the present study. State disgust was used to test the hypotheses, while trait disgust functioned as a reliability check for the state disgust. Trait disgust was also used to help clarify whether interpersonal state disgust was an independent type of disgust elicited to protect social order as the traditional model (Rozin et al., 2000) suggests, or whether this type of disgust was associated with pathogenic concerns as the functional model (Tybur et al., 2009) suggests. Additionally, gender differences were explored in relation to the trait of disgust and perfectionism.

Method

Participants

An a priori power calculation for a multiple linear regression analysis in anticipation of a medium size effect (Cohen, 1988; effect size = 0.15, power level = 0.80, 6 predictors, $\alpha = 0.05$) indicated that 98 participants were required. Additional participants were considered as a hedge against mortality (those who may not complete the study); thus, 120 undergraduate ($M_{age} = 20.4$; $SD_{age} = 1.7$) students (60 females) from a small liberal arts college were recruited for this study. Participants were compensated with either extra credit in a psychology course or $10.

Materials

The *Almost Perfect Scale-Revised* (*APS-R*; Slaney et al., 2001) was used to classify people into either adaptive, maladaptive, or non-perfectionists. The APS-R is based on a combination of early perfectionist theories (Frost et al., 1990; Hewitt et al., 1991) and delineates positive and negative aspects of perfectionism. These perfectionist types were measured through performance on two subsections: (1) standards, which are personal expectations for one's self, and (2) discrepancy, or the perceived difference between standards and performance. The discrepancy score indirectly assesses the effects of perfectionism on impersonal relationships (Shea et al., 2006).

The *Three Dimensions of Disgust Survey (TDDS*; Tybur et al., 2009) was based on the functional model of disgust and used to evaluate three types of trait disgust (pathogen, sexual, moral). Separate scores were calculated for each type of disgust trait.

Scenarios These materials and supporting documentation can be found at the Open Science Framework (see osf.io/puzjw). A set of 32 scenarios, modeled after Ciaramelli et al. (2012), were presented in written form via computer using E-Prime 3.0 (Psychology Software Tools, Pittsburgh, PA). Each scenario was designed to elicit one of the following negative emotional states: Anger (included to obscure study purpose), core disgust, interpersonal disgust, or moral disgust. The emotional state elicited by each scenario was accompanied by an opportunity to receive a reward; thus each provided a conflict for the participant in which they had to choose between (1) avoiding negative emotion and rejecting the reward, or (2) coping with the emotion in order to gain the reward. Participants responded by answering a *yes*/*no* question that appeared 25 seconds (selected based on Lewandowski et al., 2003) after the presentation of the scenario as a way to encourage participants to fully read each one. Response time was measured beginning with the appearance of the question. The scenarios were similar in both length (at about 100 words each) and in lexical complexity (around 40%).

The response to each scenario's question was intended to show how willing a participant would be to resolve the conflict by disregarding the elicited emotion in favor of the reward; therefore, the time that it took to answer the question constituted a measure of ambiguity about the response (Bernstein et al., 1967). Longer response times suggested a greater conflict between the emotion and the reward (Baranski & Petrusic, 1994), while faster responses indicated lower ambiguity.

Procedure

Participants signed an IRB approved consent form, then were given instructions about the study. Participants were told to read each scenario, then to answer the *yes/no* question that would soon appear below it. Information was not provided about the study's purpose or dependent variables.

Each participant was tested in a private room that contained a desktop computer. The computer's keyboard was modified by placing a yellow dot (labeled "*yes*") and red dot (labeled "*no*") over the keyboard letters "c" and "n", respectively. Participants were directed to use their dominant hand's pointer finger to press the appropriately colored dot to respond. While reading each scenario, participants were asked to rest their pointer finger on a blue dot that was located in front of the keyboard (between the yellow and red dots) as an attempt to control for time variations that could be caused by differences in hand distance from the response keys.

Participants started the study by pressing any key. Once a scenario appeared and the question was answered, the next one was automatically presented; presentation of all 32 scenarios took approximately 20 min. After this task, participants completed a demographics form, the *APS-R* (Slaney et al., 2001), and the *TDDS* (Tybur et al., 2009). The demographic form was always completed first, but the other two surveys were presented in a randomly assigned order determined a priori.

Results

Outlier analysis

Logs of the raw response times were taken to normalize the distribution (Whelan, 2008). Outliers were removed if the log response times were more than three IQRs above the upper quartile for that scenario (per Seo, 2006), which led to the removal of only two of the 3840 response times collected.

Perfectionist traits

The *APS-R* subscales were used to classify participants as adaptive, maladaptive, or non-perfectionists (cutoff values suggested by Rice & Ashby, 2007). Participants who scored highly in the subcategory of standards ($\geqq 42$) were considered adaptive perfectionists (26 men, 14 women), those who also scored highly in the subcategory of discrepancy (≥ 42) were classified as maladaptive perfectionists

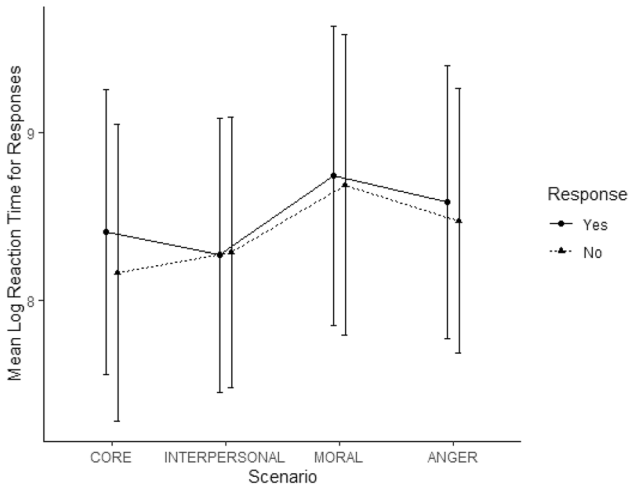

Fig. 1 Mean response times for responses by disgust scenario type in Study 1. Error bars are standard deviations

(13 men, 29 women), and the remainder were considered non-perfectionists (21 men, 17 women).

Women were more likely than men to be perfectionists (72% of women, versus 65% of men). Furthermore, when identified as a perfectionist, women were more likely to meet the criteria for maladaptive perfectionism (63% of women perfectionists), whereas men more often met the criteria for adaptive perfectionism (62% of men perfectionists). The differences among the genders across perfectionist categories are statistically significant [χ^2 (2) = 10.116, p = .006, *Cramer's V* = 0.29].

Primary hypotheses and response speed

The first primary hypothesis was that adaptive perfectionists would be more likely to answer "*no*" (deny the reward) with faster response times to core disgust than to the other scenario types. The second was that maladaptive perfectionists would deny interpersonal and moral disgust scenarios more quickly than core disgust scenarios.

Log response time was examined using a linear mixed model with factors for scenario type (core, moral, interpersonal, anger), gender, perfectionist type, and response type (*yes/no*), along with a random effect for subject (each participant rated eight scenarios of each type) to see whether these variables influenced how quickly a participant responded to the question after the scenarios. The full factorial model which tested a four-way interaction between scenario type, gender, perfectionist type, and response was not significant. Removing all higher order non-significant interactions resulted in a model in which only the interaction of scenario type and response was statistically significant [$\chi^2(3) = 17.05$, $p = .001$], which showed that the differences in time between "*yes*" and "*no*" responses varied by scenario. There was also a robust main effect for scenario type, which was significant even in a main-effects only model [$\chi^2(3) = 175.04$, $p < .001$]. No other variables were significant.

Post-hoc analysis performed by restricting the response time model to only Response Type for each scenario showed that only core disgust [$\beta = 0.21$, $t(836) = 4.18$, $p < .001$] differed in terms of the time taken for response type (see Fig. 1). For the core scenarios, people took longer to say "*yes*" ($M = 8.41$, $SD = 0.86$) than to say "*no*" ($M = 8.17$, $SD = 0.89$), though this effect was small (Cohen's $d = 0.28$) and did not hold for the other scenarios. Thus, it might have been difficult for people to overcome the emotion elicited by core disgust, possibly due to the innate motivation to avoid physically contaminating the body (Olatunji et al., 2008).

Similar post-hoc tests examining the response times by scenario type showed that, for "*yes*" responses, subjects took longer to respond for moral ($M = 8.74$, $SD = 0.89$) and anger ($M = 8.58$, $SD = 0.81$) than core ($M = 8.41$, $SD = 0.85$; moral vs. core: $t(565)$=4.90, p <.001; anger vs. core: $t(697) = 2.86$, $p = .004$) and interpersonal ($M = 8.27$, $SD = 0.81$, moral vs. interpersonal: $t(650)$=7.7, $p < .001$; anger vs. interpersonal: $t(860) = 5.85$, $p < .001$). For "*no*" responses, subjects took longer to respond to moral ($M = 8.69$, $SD = 0.89$) than anger [$t(1189) = 4.37$, $p < .001$], interpersonal [$t(1017) = 7.7$, $p < .001$], or core [$t(1254) = 10.4$, $p < .001$]. Subjects also took longer to answer "*no*" for anger ($M = 8.47$, $SD = 0.79$) than interpersonal [$M = 8.29$, $SD = 0.81$; $t(947) = 6.38$, $p < .001$] or core [$M = 8.16$, $SD = 0.81$; $t(1181) = 6.4$, $p < .001$]. These results suggest that moral disgust and anger scenarios generated more internal conflict than core and interpersonal disgust, which were resolved relatively quickly.

The tendency to accept the reward

Scenario responses indicated whether a participant would resolve the conflict between emotion and reward by responding "*no*" to avoid the emotion or "*yes*" to accept the reward. A logistic mixed model regression with a random effect for subjects assessed differences in the likelihood of responding "*yes*" to each scenario by Perfectionist Type, Scenario Type, and Gender using the lme4 package (Bates et al., 2014) in R. The full model found no interaction effects; removing the non-significant interactions to examine main effects showed that gender was statistically significant [χ^2 (1) = 4.88, p = .027], as was scenario type [χ^2 (3) = 95.77, $p < .001$]. Figure 2 illustrates these results. The main effect of gender showed that, overall, men were more likely than women to accept the reward (proportion "*yes*" men: 0.432, proportion "*yes*" women: 0.389, Cohen's $h = 0.09$, see Fig. 2).

For a post-hoc test on the likelihood of saying "*yes*" for each scenario type, the logistic regression was executed with only scenario type as an effect (proportion "*yes*":

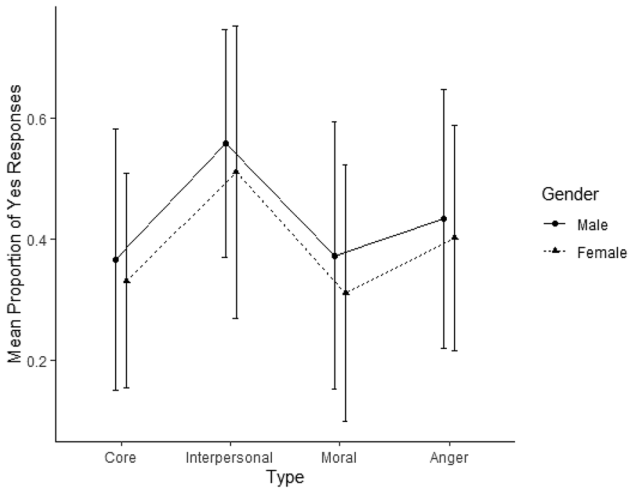

Fig. 2 Mean proportion of "Yes" responses by disgust scenario type and gender in Study 1

interpersonal = 0.534; moral = 0.342; core = 0.349; anger = 0.418). Participants were significantly more likely to say "*yes*" in an interpersonal scenario, than for any of the others (vs. moral disgust: $\beta = 0.82$, $z = 8.57$, $p < .001$, $h = 0.39$; vs. core $\beta = 0.78$, $z = 8.24$, $p < .001$, $h = 0.38$; vs. anger: $\beta = 0.48$, $z = 5.18$, $p < .001$, $h = 0.23$). Participants were also significantly more likely to say "*yes*" in an anger scenario than in either a core or moral disgust scenario (vs. core: $\beta = 0.30$, $z = 3.14$, $p = .002$, $h = 0.14$; vs. moral: $\beta = 0.33$, $z = 3.48$, $p < .001$, $h = 0.16$). There were no other statistically significant differences.

Perfectionism, gender, and trait disgust

Participants were asked to self-report their tendency toward disgust by completing the TDDS survey, which measured three subcategories (pathogen, sexual, and moral) of trait disgust, rather than the scenarios which examined state disgust (core, interpersonal, and moral). The proportion of "*no*" answers for each participant by scenario type was compared to the survey responses using Pearson correlation coefficients. Moral disgust from the scenario task and moral disgust trait scores from the *TDDS* were significantly correlated, [r (118) = 0.37, $p < .001$] as were Pathogen *TDDS* scores with core scenarios [$r(118) = 0.27$, $p = .001$] and also with interpersonal disgust scenarios [$r(118) = 0.25$, $p = .005$]. Females ($M = 20.4$, $SD = 8.26$) expressed higher sexual disgust in the TDDS survey [$t(115)=4.32$, $p < .001$, $d = 0.79$] than males ($M = 14.37$, $SD = 7.09$), but there were no differences between the genders for the other TDDS survey categories.

A multinomial regression to predict perfectionist type using TDDS survey results and the "*no*" proportion from the disgust scenario response times, with gender as a control, failed to find any difference between perfectionist types. In keeping with the earlier chi-square, the regression did find a significant difference in gender ($\beta = -1.47$, $z = -2.81$, $p = .005$) when comparing adaptive and maladaptive perfectionists, with women more likely than men to be maladaptive perfectionists (women $p = .48$, men $p = .22$, $h = 0.57$).

Discussion

Primary hypotheses

The hypotheses of the present study predicted that the state emotion of disgust that was related to physical contamination (core) would be treated differently than disgust associated with social influences (interpersonal and moral); these differences were expected to contrast between the adaptive and maladaptive perfectionists. Adaptive perfectionists were predicted to react more quickly to avoid scenarios involving core disgust, an emotion elicited to protect the physical self, than to the more socially-focused interpersonal and moral disgust. In contrast, due to their focus on others, maladaptive perfectionists were anticipated to react more quickly to avoid situations involving interpersonal and/or moral disgust, which are elicited to protect society, than to core disgust. The results of Study 1 did not support these hypotheses but showed instead that all participants (regardless of perfectionist type) were less likely to avoid situations that elicited interpersonal disgust than the other types of scenarios. In short, the present findings demonstrated differences in the way that participants responded to disgust scenarios, both in the tendency to say "*yes*" and in the speed at which decisions were made, that were independent of perfectionist type. The results were influenced by gender in that men were much more likely to accept the reward than women, who were more likely to be perfectionists.

Study 2

Study 1 failed to show an interaction between disgust factors and perfectionist type; this lack of difference could possibly be due to the specific instrument used to measure perfectionism. The discrepancy subscale of the *APS-R* is used to differentiate adaptive and maladaptive perfectionists but does not specifically incorporate socially-prescribed perfectionism into the subscale. Instead, the discrepancy subscale measures the perceptual difference between standards and perfect performance appraisals (Flett et al., 2016); thus, it accounts for much of the negativity associated with perfectionist traits but does not directly measure the impact of social standards.

The use of the *APS-R* for the purposes of this investigation may not have been well-placed because it does not

address the social aspects of perfectionism that are important for the present experimental questions. While the *APS-R* is psychometrically sound (Slaney et al., 2001; Vandiver & Worrell, 2002), it is possible that usage of a different measure that encompasses more social processes could more directly address the original hypotheses. It is possible that replicating the research design of Study 1 with the substitution of the Hewitt and Flett Multidimensional Perfectionism Scale (*MPS*; Hewitt et al., 1991) could garner findings in line with the original hypotheses, as this instrument assesses the social aspect of perfectionism. Fear of mistakes, self-criticism, and socially-prescribed perfectionism are adequately measured using the *MPS*; thus, it may allow for a better exploration of the hypotheses that people with socially-motivated perfectionism would respond more quickly to avoid scenarios eliciting social-contamination (moral or interpersonal disgust), while those with self-oriented perfectionist traits would respond more rapidly to avoid self-contamination (core disgust).

Study 2 seeks to evaluate the relationship between perfectionism, gender, and disgust in an expanded sample. Similar hypotheses and methodology to Study 1 were used, with a few notable exceptions. In place of the *APS-R*, perfectionism was evaluated using the *MPS* to better discriminate between self-oriented and socially-prescribed perfectionism. In addition, the *COVID-19 Threat Scale* (Kachanoff et al., 2021) was included as a method of measuring any increases in disgust that might have occurred due to the collection of data during the COVID-19 pandemic. Lastly, age was considered as an individual difference that could have potentially influenced the state emotion of disgust (Fessler & Navarrete, 2005). Age was not considered in Study 1 because the age range of the college students who were participants was quite narrow.

Method

Pre-registration

The hypotheses and analyses for Study 2 were pre-registered at Aspredicted.org on June 4, 2021 at 8:19 AM Pacific Time (PT), before the data was analyzed, but after it was collected. The data resulting from this Study and their analyses are available at OSF (http://osf.io/puzjw/).

Participants

A power analysis was run by simulating data based on the observed inter-subject variability and scenario, perfectionism, and gender effect sizes in Study 1. The percent of simulations that found a significant effect of perfectionist type, gender, and scenario on the likelihood of selecting the reward in the disgust scenarios was calculated for a series of sample sizes. A sample size of 360 was found to give an approximate power of 83%. Because the literature on disgust suggests a gender bias, a balanced number of female and male participants were used in the simulations.

A total of 380 participants were recruited from a sample of Qualtrics users (ages ranged from 18 to 99, $M = 47.2$, $SD = 19.3$). However, participants were eliminated from the study if they gave the same response to all questions on the perfectionism survey, all questions on the TDDS survey, or all 32 scenarios. This resulted in the elimination of 30 participants, reducing the sample to 350 participants. Furthermore, six individuals did not provide their age and were thus removed from any analyses including age as a factor, which reduced the sample to 344 participants. There was a total of 157 women and 187 men in the study. To eliminate potential confounds due to sexual orientation, only heterosexual individuals were recruited for the study.

Materials

This study used the same disgust scenarios, demographic questions, and disgust measure (the TDDS) as in Study 1. However, the *Multidimensional Perfectionism Scale* (*MPS*; Hewitt et al., 1991) was used to measure perfectionism, rather than the *APS-R*. The *MPS* assesses the social aspect of perfectionism, as well as self-oriented and other-oriented perfectionism. Each of the 45 items are measured as agreement on a 1 (*disagree*) to 7 (*agree*) scale (Hewitt et al., 1991).

Given that the present study was conducted during the COVID-19 pandemic (May, 2021), the *COVID-19 Threat Scale* (Kachanoff et al., 2021) was included to account for potentially enhanced disgust sensitivities due to a perceived threat of the virus. This survey addresses the realistic and symbolic risks that a person might feel from COVID-19 (Kachanoff et al., 2021). Each of the 10 items are measured on a 1 (*Not a threat)* to 4 (*Major threat)* scale.

Procedure

Data for this study were collected between May 15, 2021 and May 24, 2021 by an online Qualtrics survey. After indicating their consent to participate, each participant completed a short demographic survey. Participants then responded to the series of randomized scenarios meant to elicit the emotions relating to pathogen disgust, moral disgust, interpersonal disgust, and anger. As in Study 1, each scenario appeared on the screen for 25 seconds, followed by a related, forced choice response, yes/no question; unbeknownst to participants, responses to scenarios were timed. After responding to all 32 scenario questions, the participants completed the *MPS* (Hewitt et al., 1991), the *TDDS* (Tybur et al., 2009), and the *COVID-19 Threat Scale* (Kachanoff et al., 2021).

These three surveys were presented in a randomly assigned order to each participant, so as to prevent order bias. Median time to complete the entire study was 22 min.

Results

Missing and outlying data

One participant skipped one question on the *TDDS*, and five individuals skipped one question on the *MPS*. In these cases, the missing questions were imputed using MICE (Van Buuren & Groothuis-Oudshoorn, 2011) to allow the calculation of *MPS* and *TDDS* for these participants. Of all the scenario reponses (11,008 cases), there was one case where the participant did not respond. This response was removed from the data, but the participant was otherwise included. Additionally, 100 participants had survey responses that were removed for being outliers (i.e., more than 3*IQR above the Upper Quartile), but the participants' other responses were still included. The number of participants was equal to the pre-registered estimate, and the presented analyses are as pre-registered, unless specified otherwise.

Perfectionist traits

Each participant received three perfectionist scores from the *MPS*: *social*, *self*, and *other* orientated perfectionism. Women scored higher than men in social-orientated perfectionism, but there were no gender differences regarding self- or other-orientated perfectionism. A two-way repeated measures ANOVA showed a significant interaction term between gender and perfectionism subscales [$\chi^2(2) = 8.57$, $p = .013$]. Post-hoc t-tests found that only social-oriented perfectionism was statistically significantly different between males and females [$t(327) = 3.27$, $p = .001$]; other- and self-oriented perfectionism did not significantly differ by gender.

Primary hypotheses and response speed

Log response time was examined using a linear mixed-model with factors for scenario type, gender, and response (*yes*/*no*), including a term for each perfectionism score (self, social, other) along with a random effect for subjects. The full factorial term (Scenario Type × Gender × Response Type × Perfectionism) was not significant for any of the perfectionism scores except for social. However, once the non-significant perfectionism types (self and other) were removed from the model, social perfectionism was no longer significant, indicating that the significance initially observed was due to multicollinearity. Thus, perfectionism was not related to response time; this is in line with the results of the first study.

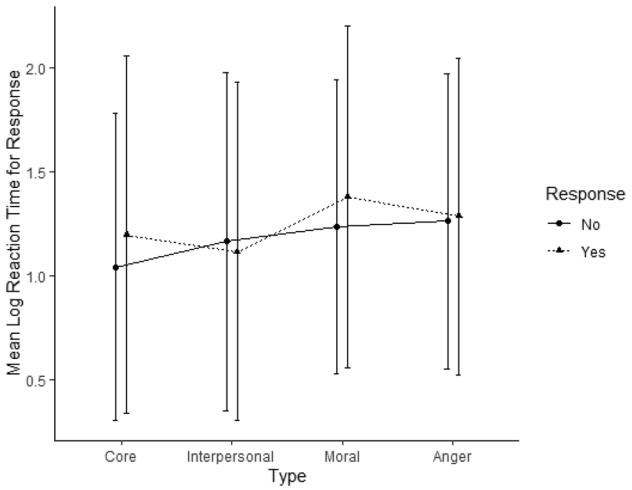

Fig. 3 Mean response times for responses by disgust scenario type in Study 2. Error bars represent standard deviations

Given that perfectionism was not significant, all perfectionism scores were removed from the model, thus, the model included Gender, Scenario Type, and Response Type (*yes*/*no*). Gender did not differ in log response times; however, log response times did significantly differ depending on Scenario type and Response Type [$\chi^2(3) = 19.2$, $p = .0002$].

Post hoc tests found that only core [$\chi^2(1) = 10.15$, $p = .001$] and moral [$\chi^2(1) = 16.5$, $p < .001$] disgust had statistically significant times that varied by Response Type (i.e., for core and moral it took significantly longer to say "*yes*" compared to "*no*", see Fig. 3). The three types of disgust scenarios and anger were all statistically different from each other in terms of response times for both "*yes*" responses [$\chi^2(3) = 55.4$, $p < .001$] and "*no*" responses [$\chi^2(3) = 121.6$, $p < .001$].

Participants took significantly longer to say "*yes*" for moral disgust compared to core disgust [$\chi^2(1) = 22.0$, $p < .001$] and interpersonal disgust [$\chi^2(1) = 47.2$, $p < .001$], and was not significantly different from anger response times. Additionally, it took longer to respond "*yes*" to anger scenarios compared to interpersonal scenarios [$\chi^2(1) = 25.3$, $p < .001$], but there was no difference between anger "*yes*" response times and those for core disgust. Core and interpersonal disgust response times to say "*yes*" did not significantly differ.

In terms of responding "*no*" to the four types of scenarios, participants took longer to respond "*no*" to anger compared to interpersonal [$\chi^2(1) = 17.8$, $p < .001$] and core disgust [$\chi^2(1) = 89.4$, $p < .001$]. Additionally, participants took longer to respond "*no*" to moral than interpersonal [$\chi^2(1) = 13.9$, $p < .001$] and core disgust [$\chi^2(1) = 83.1$, $p < .001$]. Additionally, it took significantly longer to respond "*no*" to interpersonal disgust compared to core disgust [$\chi^2(1) = 15.3$, $p < .001$]. However, there was no significant difference

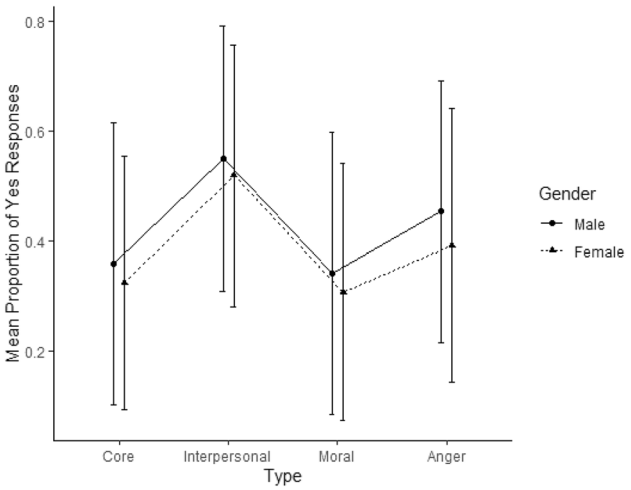

Fig. 4 Mean proportion of "Yes" responses by disgust scenario type and gender in Study 2. Error bars are standard deviations

between moral and anger "*no*" response times. Please see Fig. 3 for means and standard deviations.

Likelihood of saying "*Yes*"

A logistic mixed model for the likelihood to say "*yes*" to the response was executed with Scenario Type and Gender as factors, the three perfectionism as covariates, and a random effect to account for the repeated subjects. The full factorial model with all three perfectionism scores had no significant factors, and removing all non-significant terms left a model with only Scenario Type [$\chi^2(3) = 342.8$, $p < .001$] and Gender [$\chi^2(1) = 4.332$, $p = .037$], with men more likely to say "*yes*" than women for all scenarios (see Fig. 4).

Post hoc tests on the likelihood of saying "*yes*" for each scenario type (proportion "*yes*": anger = 0.41, core = 0.34, interpersonal = 0.54, moral = 0.33) showed that participants were more likely so say "*yes*" to interpersonal than anger [$\chi^2(1) = 92.4$, $p < .001$], core [$\chi^2(1) = 32.2$, $p < .001$] and moral scenarios [$\chi^2(1) = 51.2$, $p < .001$]. People were also more likely to say "*yes*" to anger than core [$\chi^2(1) = 230.5$, $p < .001$] or moral scenarios [$\chi^2(1) = 269.0$, $p < .001$].

Perfectionism

To examine the relationship between trait disgust and state disgust, the proportion of "*no*" answers for each participant by scenario type was compared to the survey responses using Pearson correlation coefficients. Moral disgust from the TDDS survey and from the scenario task were positively correlated [$r(342) = 0.26$, $p < .001$], as were the pathogen TDDS scores with the core [$r(342) = 0.19$, $p < .001$], but not the interpersonal scenario responses. Females ($M = 5.17$, $SD =$) expressed higher sexual disgust [t(325) = 2.65, $p =$ .008] in the TDDS survey than males ($M = 4.87$, $SD =$), but there were no differences between the genders for the other TDDS survey categories.

To examine the relationship between the perfectionism types (self, social, other) and both the state (scenarios) and trait disgust measures (*TDDS*), a linear regression was conducted for each of the three perfectionism scales. Each perfectionist type was regressed onto moral *TDDS* scores, pathogen *TDDS* scores, sexual *TDDS* scores, the "*no*" percentage of each type of scenario responses (core, interpersonal, moral, and anger), Gender, Age, *COVID-19 Realistic Threat* score and *COVID-19 Symbolic Threat* score. In the full model, with all predictors, only Age was significant in both social-orientated and other-orientated perfectionism [Social: $\beta = -.15$, $t(332) = -3.02$, $p < .001$, Other: $\beta = -.11$, $t(332) = -3.48$, $p < .001$]. For self-orientated perfectionism, both Age [$\beta = -.24$, $t(332) = -6.65$, $p < .001$] and the proportion of "*no*'' responses from Anger scenarios [$\beta = -6.02$, $t(332) = -6.02$, $p = .04$] were significant.

Mild multicollinearity (max VIF = 3.6) and the large number of predictors could explain the lack of significance in the models. Thus, backward selection was conducted on each of the three regressions using AIC to select the "best" model for each of these perfectionist types.

For self-oriented perfectionism, *COVID-19 Realistic Threat* score and *Moral TDDS* scores were retained, but not significant. Significant variables included the proportion of "*no*" responses on Anger scenarios [$\beta = -7.2$, $t(338) = -2.19$, $p = .03$], the Core/pathogen TDDS score ($\beta = 2.83$, $t(338) = 2.167$, $p = .031$) and Age ($\beta = -0.14$, t(338) = −3.36, $p < .001$).

For social-oriented perfectionism, the variables retained by the variable selection process were all significant. They were the proportions of "*no*" responses on Anger scenarios [$\beta = -5.1$, $t(340) = -6.65$, p = .04], Sexual *TDDS score* [$\beta = 1.56$, $t(340) = 2.74$, $p = .006$], and Age [$\beta = -0.24$, $t(340) = -8.01$, $p < .001$].

For other-orientated perfectionism, Gender was retained in the model, but it was not significant. Core/pathogen *TDDS* scores [$\beta = 1.46$, $t(340) = 2.79$, $p = .005$] and Age [$\beta = -0.11$, $t(332) = -3.74$, $p < .001$] significantly predicted perfectionism.

Discussion

The relationship between disgust and perfectionism

Both of the present studies predicted that the scenarios involving core disgust (self-contamination) would elicit different responses than interpersonal or moral disgust (socially motivated); these differences were expected to contrast between the self-orientated and socially-prescribed

perfectionists. Neither study supported the hypotheses, but instead showed differences between types of state emotions that were consistent for all participants regardless of perfectionism—namely, that people were less likely to avoid situations eliciting interpersonal disgust than the other scenarios. In short, although both of the present studies demonstrated differences in the way that participants responded to scenarios inducing state disgust, both in the tendency to say "*yes*" and in the speed at which decisions were made, the differences were independent of the participants' level of perfectionism.

Even though state disgust was not influenced in either of the present studies by perfectionism, relationships between trait perfectionism and trait disgust were revealed in Study 2. The evaluation of perfectionism with the *MP*S (Hewitt et al., 1991) showed that both other-oriented and self-oriented perfectionism were related to core/pathogen disgust. Thus, people who were more susceptible to disgust due to potential contamination of the self (core/pathogen) were also more susceptible to two different types of perfectionism that share high expectations that arise from the individual - either in terms of expectations for the self or for others around the self. This trait-level finding lends some support to the idea that self-oriented perfectionists would experience more core/pathogen disgust and feel a need to avoid self-contamination. It is generally in keeping with the literature that suggests that people with eating disorders are not only self-oriented perfectionists, but are also more prone to core disgust (Olatunji & Sawchuck, 2005). These results also suggest that core/pathogen disgust may be a motivation for the high demands that other-oriented perfectionists have for the people around them.

Study 2 also demonstrated another relationship between trait perfectionism and trait disgust in the finding that people with socially-motivated trait perfectionism showed high levels of trait sexual disgust (i.e., social-contamination). Because people high in socially-motivated perfectionism are particularly concerned with the high demands that they believe other people have for them, they may be strongly averse to actions that may violate social norms, such as deviant sexual behaviors.

Gender Differences

Both of the present studies showed gender differences in perfectionism and in both trait and state disgust. Women in Study 1 were more likely to be classified as perfectionists, in keeping with at least one previous finding (Elison & Partridge, 2012); in both studies, women demonstrated more maladaptive (social-oriented) trait perfectionism than did the men. The higher level of maladaptive perfectionism suggests that women tend to have higher standards than men, and are more likely to feel as though they have not successfully met those standards. This finding also supports previous evidence that women are more likely to experience disorders that are associated with maladaptive perfectionism such as Social Physique Anxiety (Haase et al., 2002). The findings from the present studies also support the general concept that types of perfectionism vary by gender; however, the specific gender differences that have been previously reported in other-oriented perfectionism (Hill et al., 1997) and self-oriented perfectionism (Stoeber et al., 2021) were not observed in Study 2.

In addition to perfectionism, both of the present studies also clearly demonstrate gender differences in trait and state disgust. Both studies showed state differences in disgust, with men being much more likely to say "yes" to the disgusting activity for the reward than were women, suggesting that they experienced a lower level of disgust from the activities. Both studies also showed that women were more sensitive to trait sexual disgust than men. These findings are in keeping with gender differences in disgust previously observed in the literature (Fessler et al., 2004; Connolly et al., 2008; Al-Shawaf et al., 2018), and the consistency of these results in the present series of studies supports the idea that gender mitigates the experience of disgust.

Thus, men and women in the present studies differed in terms of both trait perfectionism and trait sexual disgust, as well as state disgust. These gender differences muddle the potential associations between disgust and perfectionism and provoke questions about the possibility of a mitigating role of gender (Connolly et al., 2008). Gender may act to alter the experiences of both disgust and perfectionism, leading to higher levels of diagnoses of psychological disorders that combine the two emotions, such as eating disorders (Galmiche et al., 2019), in women.

Differentiation of state disgust

Four different state emotions were evaluated in the disgust scenario tasks in the present studies, three of which evoked specific types of disgust. The scenarios designed to elicit interpersonal disgust, moral disgust, and core disgust differed from each other in significant ways, suggesting that the internal struggles as to whether to overcome the emotions differed as well.

Interpersonal disgust

Interpersonal disgust is rooted in the repulsion that individuals feel when confronted with other people who are undesirable in some way. Scenarios designed to elicit interpersonal disgust resulted in participants overcoming the socially motivated emotion more often than any other type of scenario in both of the present studies. The consistency of these results supports the idea that interpersonal

disgust differs in substantial ways from other types of disgust and from anger (Ciaramelli et al., 2012; Kupfer & Tybur, 2017). Though previous literature has explained the differences between interpersonal disgust and other types of disgust within the confines of their specific experimental variables, the present findings suggest a more generalized difference between interpersonal disgust and other subtypes of disgust. The rapid *acceptance* of rewards in situations designed to elicit interpersonal disgust raises the possibility that disgust may be minimized in interactions with strangers for the sake of harmonious social interactions. It is also possible that people simply viewed the interpersonal scenarios in these studies as less disgusting than those designed to elicit core/pathogen, or moral. A similar finding has been reported in at least one other study that used very similar stimuli to the present studies (Ciaramelli et al., 2012), suggesting that it is at least possible that the magnitude of disgust elicited by these scenarios may be lower.

Moral disgust

Moral disgust arises from concern about the social order, and as such, may intrinsically reflect more of a conflict for people. Individuals in both studies took longer to respond (as either *yes* or *no*) in responses to moral disgust scenarios than to other types of scenarios. Further, in Study 2, people took longer to overcome their feelings of moral disgust and accept the reward than to reject it. This shows that people in the present studies struggled more with ambiguity if they ultimately decided to push past, rather than avoid the emotion. Quickly responding "*no*" to moral disgust might speak to the adaptiveness of this type of disgust, in that quickly avoiding social contaminants are important for survival within a society (Olatunji et al., 2008).

Core disgust

Core, or pathogenic, disgust is thought to originate in a need for protection of the self (Rozin et al., 2000). For both studies, people took longer to overcome the emotion of core disgust by responding "*yes*" rather than "*no*." Additionally, in Study 2, people responded "*no*" to core disgust more quickly compared to the other scenarios; in Study 1, people responded more quickly to core and interpersonal "*no*" responses than to moral and anger responses. Quickly responding "*no*" to core disgust, in both studies, suggests an adaptive avoidance meant to physically protect the self from contaminating substances; this idea has been widely accepted in disgust literature (Olatunji et al., 2008; Rozin et al., 2000; Tybur et al., 2009).

Implications for models of disgust

The traditional (Rozin et al., 2000) and the functional (Tybur et al., 2009) models agree in their treatment of disgust from contamination (core/pathogen) and violation of social norms (moral), but differ in terms of interpersonal disgust. The results of the present studies provide an opportunity to distinguish between models of disgust by examining responses to the emotion. Performance on state and trait versions of both moral and core/pathogen disgust were highly correlated with each other, indicating that similar substrates may underlie both the responses to the scenarios and performance on these sections of the *TDDS*. In Study 1, but not Study 2, the scenarios eliciting state interpersonal disgust were related to trait core/pathogen disgust. This finding seems to lend some support to the functional model of disgust, which suggests that people might react to interpersonal disgust as a part of pathogenic avoidance (Tybur et al., 2013), and indicates that interpersonal disgust functions to protect the self, rather than to protect social relations. However, state interpersonal disgust seemed to produce less discomfort than state core disgust, as it was easier to overcome, complicating the interpretation that core and interpersonal disgust have the same underlying motivations.

While core and interpersonal disgust scenarios produced less conflict compared to other emotions, the lack of ambiguity to core disgust is likely an adaptive strategy to quickly *avoid* physical contamination. The quick *acceptance* of interpersonal disgust is likely more complicated and suggests that higher-level social factors may take priority in interactions with strangers. Thus, the similarities in response times for interpersonal and core disgust could be considered as support for combining the domains, as suggested by the functional model (Tybur et al., 2009), however, it is important to consider the full findings. When people decided to avoid disgust, they took the same amount of time to respond to interpersonal and core scenarios, but people avoided disgust less often in interpersonal than core scenarios, suggesting an overall difference in emotional experiences. Future research should explore further comparisons between interpersonal and core disgust to clarify models.

Study 2 considered the possibility that the pandemic context in which it was performed could have influenced disgust sensitivities due to the perceived realistic and symbolic risks that a person might feel regarding COVID-19 (Kachanoff et al., 2021). However, this factor did not seem to affect disgust ratings, potentially because the scenarios eliciting state interpersonal disgust did not explicitly bring the virus into the situation. Thus, the scenarios were cognitively too distant from the COVID-19 pathogens to influence responses.

Implications for perfectionism

The findings of the Study 1 did not support a difference between adaptive and maladaptive perfectionists in terms of disgust, and thus suggest that other models of perfectionism could be better suited for examining self-driven versus socially-driven motivations for perfectionism. It has been suggested that the multidimensional model of perfectionism has a more specific emphasis on social influences, compared to the two-dimensional model, which uses generalized negative components of perfectionism and discrepancy (Broman-Fulks et al., 2008). The findings of the Study 2 differ from those of Study 1, quite possibly because it employed a different measure of perfectionism that was employed that reflected the multi-dimensional model. The *MPS* is theoretically grounded in the multidimensional model of perfectionism (Hewitt et al., 1991), which focuses not only on the self as a generator of high expectations (both of self and others) but also on the self as the object of the high expectations of others. Thus, the relationship observed between disgust and perfectionism in the present study does lend some support to the multidimensional model of perfectionism because of its specific emphasis on social influences, rather than the focus on discrepancy that is characteristic of the two-dimensional model (Slaney et al., 2001).

The effects of age were similar across all perfectionist types in that older people were less likely to be perfectionist than younger people. In the current study, age was controlled for because the age range of the participants in Study 2 was significantly different from the age range in Study 1 (i.e., the college sample showed little variance in age). Of note, the current findings align with previous research showing that younger adults had higher levels of perfectionist traits compared to older adults (Robinson et al., 2021).

Anger

The state emotion of anger was included primarily as a control in the present studies. However, like interpersonal disgust, anger scenarios also produced more "*yes*" responses than either core or moral disgust in both studies. The anger scenarios in these studies involved interactions with others, much like the interpersonal scenarios, suggesting that directly interacting with strangers may heighten people's willingness to overcome a negative emotion more than an interaction with contaminated objects or moral violation. Even though moral disgust produced more conflict than anger scenarios (e.g., longer response times), responses to anger scenarios more frequently led to reward acceptance. Though anger has been suggested as an intrinsic factor in moral disgust (Salerno & Peter-Hagene, 2013), the present results point out that emotional expression depends on whether social norms are violated. Moral disgust conveys more social threat than anger, which is self-interested (Kupfer & Giner-Sorolla, 2017). Thus, anger produced by a violation to the self is difficult to express in a social situation because acts of anger might be evaluated as selfish or violent, which may garner negative appraisals from others. In scenarios that produce "anger" elicited from a social violation (like moral disgust), instead of a personal violation, it is likely that *not* reacting negatively toward the behavior would produce a threat to the social-self because others expect a negative reaction when norms are violated.

In Study 2, state reactions to anger scenarios also were unexpectedly associated with both self-orientated and socially-orientated perfectionism. The results showed that both of these types of perfectionists were more likely to respond "*yes*" to anger scenarios. The absence of a relationship with other-oriented perfectionism is notable, as this trait has been associated with hostility (Smith et al., 2021). The implications of these findings are unclear in the present context as the study did not aim to address perfectionism and anger; however, these findings could imply that the setting of high standards (regardless of motivation for the standards) could be related to people's reactions to anger inducing situations. Some previous research (Muñoz-Villena et al., 2020) has found that self-esteem, which was not measured in the present set of studies, is also a mediator between perfectionism and anger. Future research that tests these findings further should include a measure of self-esteem, in order to explore this possiblity.

Limitations

The trait emotion data reported here was the result of self-report, and as such is subject to a certain degree of bias by participants. It is likely that some of this may have been amplified in Study 2, which was conducted via Qualtrics Audience. Online behavioral research is subject to a number of data quality issues (Pe'er et al., 2021), though we attempted to avoid them through the filtering reported. In addition, although care was taken in Study 1 to minimize variables such as distance to the keyboard that could affect response times, because Study 2 was conducted via the internet, these variables could not be controlled as carefully. While this may have raised the level of noise in the present data, it is unlikely to have influenced the data systematically.

Conclusions

Our findings contribute to the ongoing conversation regarding the role of disgust as a factor in social/interpersonal encounters (Tybur et al., 2013), particularly with strangers and socially stigmatized individuals, which is viewed

differentially in the traditional (Rozin et al., 2000) and functional (Tybur et al., 2009) models. This study showed that it was easier to overcome interpersonal disgust than other negative emotions and easier to overcome anger compared to core and moral disgust. This suggests that direct interaction with another person produced lower rates of emotional avoidance than a potential physical or social contamination. In other words, people were equipped to cope with interpersonal disgust differently and with less avoidance than the other emotions, supporting a potential difference in emotional experiences and supporting the traditional model (Olatunji et al., 2008; Rozin et al., 2000). Additionally, future research may benefit from distinctions between interpersonal disgust and other types of disgust as it allows for insight regarding how people cope with dangerous situations in order to benefit an interpersonal interaction, rather than protect the physical self. For example, the readiness or motivation to cope with interpersonal disgust could help explain the lack of condom use in some sexual encounters, or might provide insight regarding people's desire to be polite rather than defensive with threatening strangers.

The examination of trait and state emotions can propel research toward understanding factors that influence moment-to-moment decisions. There is a need for more research to tackle the question of *why* emotional responses differ drastically among individuals, specifically addressing how these differences may affect behaviors toward others. The present study addressed this gap in the literature by providing evidence on the interconnectedness of disgust and anger situations and considering them in the light of trait perfectionism. Additionally, this paper invites new perspectives to be taken on disgust theory and the subtypes of core, interpersonal, and moral disgust.

Author contributions MM and TW contributed to this paper through study design, data collection, data analysis, and manuscript writing. CC contributed to the analysis and manuscript writing.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest to disclose

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