



Explicitness, disgust, and safe sex behavior: A message experiment with U.S. adults[☆]

Sebastiaan Gorissen^{a,*}, Helen M. Lillie^b, Daniel Chavez-Yenter^c, Alexis Vega^c, Kevin K. John^d, Jakob D. Jensen^c

^a Minot State University, Division of Art and Professional Communication, 500 University Avenue West, Minot, ND, 58707, USA

^b University of Iowa, Iowa City, IA, USA

^c University of Utah, Salt Lake City, UT, USA

^d Brigham Young University, Provo, UT, USA

ARTICLE INFO

Keywords:

Sex
Explicit
Disgust
Pathogen avoidance
Behavioral immune system

ABSTRACT

Sexual health risks are challenging to communicate given the potential negative reactions of target audiences to explicit language. Grounded in research on pathogen avoidance, the current study examined the impact of varying levels of explicit language on message perceptions and safe sex behavioral intentions. U.S. adults ($N = 498$) were randomly assigned to view messages detailing pandemic safe sexual behavior that contained either low or high levels of explicit language. High explicit language significantly increased perceived disgust which also indirectly linked high explicit language with increased intentions to engage in safe sex behavior. Individual difference variables moderated the impact of message explicitness; dispositional hygiene disgust moderated the impact of high explicit, hygiene-focused messages on safe sex intentions. Those with relatively low levels of dispositional disgust were more positively impacted by explicit language. The results suggest the value of increased message explicitness for sexual health communication and have implications for pathogen avoidance behaviors, the behavioral immune system, and dispositional and affective forms of disgust.

1. Introduction

Conveying sexual health risks and recommendations is a key challenge in mass communication, including during a pandemic (Döring, 2020). Encouraging pathogen protective or avoidant behaviors requires the identification of message strategies that attract attention, convey actionable information, and are guided by research.

Researchers have studied pathogen avoidance for decades, arguing that the behavioral immune system (BIS) shapes recognition of and response to infectious and parasitic threats (Hicks et al., 2021; Thornhill and Fincher, 2014). Pathogen avoidance theories, such as parasite stress theory, posit that the BIS responds protectively to “verbal, visual, or olfactory pathogen cues” including messages, experiences, and images (Ackerman et al., 2021, p. 178). While research on pathogen avoidance has often focused on evolutionary behaviors – some of which might not translate to pandemic contexts – researchers have recently called for increased scholarship testing BIS-relevant cues and underlying cognitive

mechanisms to inform intervention development (Ackerman et al., 2021). Of note for sex researchers and communication scholars, there is a specific call for scholarship identifying, explicating, and testing BIS-relevant message interventions (Ackerman et al., 2021).

The BIS is sensitive to disgust-inducing cues; notably, those that indicate threat and/or exposure (Fincher and Thornhill, 2012; Schaller and Duncan, 2016). For sexual health messages, past studies have identified message explicitness as a possible cue that could positively impact audience response (Jansma et al., 1997), although there is a need for tightly controlled message experiments varying along this dimension (Wright et al., 2015). Researchers have further postulated that disgust cues could yield differential impact based on underlying dispositional disgust of the individual, including dispositional pathogen, moral, and sexual disgust (Crosby et al., 2020; Tybur et al., 2009).

To advance our understanding of sexual health communication, pathogen avoidance behaviors, and the BIS, the current study examines whether sexual health messages varying in explicitness differentially

[☆] This manuscript was written with support from the Immunology, Inflammation, and Infectious Disease Initiative, Office of the Vice President for Research, University of Utah (Grant number 042020; PI: J. Jensen).

* Corresponding author.

E-mail address: sebastiaan.gorissen@ndus.edu (S. Gorissen).

impact cognitions (e.g., perceived disgust) and intentions to engage in preventive health behaviors. Moreover, different forms of dispositional disgust are examined as possible moderators of message explicitness.

2. Sexual explicitness and behavioral effects

While the effects of explicit sexual media images on consumers' sociosexual attitudes have been studied before (Machia and Lamb, 2009; MacKay and Covell, 1997), experimental research that manipulates levels of explicitness is far less common (Wright et al., 2015). Our study seeks to explicate the influence of sexual explicitness on behavioral effects, contributing to scholarship on the uses and gratifications of sexually explicit media. Cognitive structures guide individuals' assessments and expectations of the actions of others and threats to their own freedom, influencing their behaviors in subsequent interactions (Geis et al., 1984). Following Wright's (2011) model of media sexual socialization, scripts signal rules and expectations to individuals regarding normative and appropriate social behaviors. Explicit sexual media create novel scripts, prime dormant scripts, and encourage viewers' utilization of scripts by emphasizing certain attitudes and behaviors as normative and appropriate (Huesmann, 1998; Malamuth and Impett, 2001).

Problematically, Golde et al.'s (2000) literature review "found no study in which the manipulation of degrading themes was not confounded with sexual explicitness" (p. 224). As previous scholarship has not found an effect for sexually explicit materials on sex callousness (Davis and Bauserman, 1993; Linz et al., 1988; Malamuth and Ceniti, 1986), contemporary research suggests that potential negative impacts of exposure to violent or demeaning media are largely independent of sexual explicitness. Nevertheless, as sexual explicitness and sexual degradation have long been confounded, "it is unclear whether exposure to non-degrading, sexually explicit material will have similar consequences if the content differs significantly from the content of sexual material that degrades women" (Jansma et al., 1997, p. 4). As most commonly used stimuli in studies of sexual explicitness have not reliably, objectively, or consistently been categorized as either demeaning or non-demeaning to women (Allen et al., 1995; Linz, 1989), past studies may be difficult to interpret or reproduce.

An alternative approach to questions of explicitness is exploring whether there is a fundamental difference in the messages communicated by more or less explicit images (Krassas et al., 2003). Consequently, there is a pressing need and consistent call for more research on sexual explicitness (Donnerstein and Smith, 2001; Malamuth and Impett, 2001; Wright and Tokunaga, 2015).

3. Multiple dimensions of sexual disgust

Sexual health risks are challenging to communicate given the explicitness of the language and potential negative reactions of target audiences (e.g., reactance). Parasite stress theory posits that these challenges are heightened during a pandemic as audiences increasingly utilize dispositional disgust tendencies in response to pathogenic threats. Parasite stress theory is an evolutionary framework positing humans have evolved to activate their adaptive psychological response mechanisms in avoidance of infections and infectious agents (Brown et al., 2016). Consequently, cues or behaviors representative of pathogenic risk trigger feelings of disgust (Schaller and Duncan, 2007), and these feelings of disgust (i.e., adaptive psychological responses) have aided in our ancestors' survival by engaging in infection-avoidant behaviors.

Sexual disgust is understood as one such evolved feature of the BIS suggested by parasite stress theory (Schaller and Duncan, 2016), recognized from an evolutionary perspective as a basic human emotion fundamental to evaluating potential sexual partners and intimate situations (Tybur et al., 2009). Nevertheless, whereas the role of disgust in protecting against harmful substances has been extensively investigated,

the area of sexual disgust remains woefully understudied (Crosby et al., 2020). Aspects of sexuality have been considered in early theorizations of disgust (Angyal, 1941; Tomkins, 1963), yet the recognition of sex as a distinct category of disgust would not come until Haidt et al.'s (1994) argument for components of sexuality as fundamental to the activation of animal reminder disgust. The authors identify seven domains of disgust elicitors – food, animals, body products, sex, body envelope violations, death, and hygiene. Whereas this scholarship was fundamental to the ongoing theorization of disgust, subsequent research would problematize the theoretical justification of this division of disgust elicitors, recognizing several domains as functionally redundant from an evolutionary perspective.

Olatunji et al. (2007) reimagined the scale of disgust sensitivity to three factors – core, animal reminder, and contamination. Similarly, Tybur et al. (2009, 2013) challenged prior explications and theorized that triggers of disgust should be categorized along three domains – pathogen, sexual, and moral transgressions. All three domains were postulated to serve protective functions and encourage the survival of the human species by driving people away from infectious threats, unsafe sexual behaviors and partners, and transgressions of moral norms (Zhang, 2019). Nevertheless, as Crosby et al. (2020) underscore, due to the relatively small sample of perspectives from which Tybur et al.'s (2009) items were derived, the multidimensionality of sexual disgust may well have been misrepresented. There are measures with more singular structures (e.g. Rozin et al., 1984; Van Overveld et al., 2013), yet they may miss the nuance humans ascribe to different forms of sexual behavior (Crosby et al., 2020). Indeed, the reduction of sexual disgust to a singular dimension may neglect the qualitatively distinct adaptive issues this emotion is understood to have evolved to solve.

Sexual disgust is commonly conceptualized as consisting of an underlying information processing system, activated by a range of factors including physiological state, genetic relatedness, mate availability, mate assessment, and sociosexual orientation (Lieberman and Patrick, 2018). Scholarship has supported this conceptualization, explicating the negative impact of sexual disgust on arousal (Andrews et al., 2015; Fleischman et al., 2015; Zok et al., 2017). As disgust is an emotion promoting reproductive fitness and sexual mate selection (Phelan and Edlund, 2016), sociosexuality is understood as varying with individuals' disgust sensitivity (Tybur et al., 2015). Sexual disgust evolved as a response preventing individuals from mating with biologically suboptimal partners (Tybur et al., 2009). Over the past decade, scholars have studied the roles of disgust in arousal and the selection of sexual partners (De Jong et al., 2013; Lee et al., 2014; Sevi et al., 2018; Tybur and Gangestad, 2011).

Multiple factors seem capable of triggering sexual disgust with both the catalyst and magnitude of the emotion varying in ways that defy a single underlying dimension. As sexual disgust "motivates the avoidance of potentially costly sexual situations or mates, understanding which characteristics are associated with an individual's appraisal of costs and benefits will allow us to understand the underlying structure of this emotion" (Crosby et al., 2020, p. 3). Consequently, there is a need for studies that test whether dispositional disgust and language explicitness impact audience response to sexual health messages. To come to a closer understanding of differences in sociosexual orientation between individuals, it is essential to understand individual differences in the elicitors of sexual disgust. To this end, our study is anchored by nine major hypotheses.

Responding to the reductive limitations of previous measures of sexuality and disgust, Crosby et al. (2020) proposed a six-factor organization of items eliciting sexual disgust – hygiene, oral, same sex, BDSM, taboo, and promiscuity. (As some readers may interpret "promiscuity" as a stigma-inducing term, we henceforth will be shifting the term to "nonmonogamy.") As the authors underline, "understanding the proper domain of each facet is of critical importance in predicting and interpreting individual differences" (p. 10), they also call for future scholarship to explore the extent to which these six dimensions of sexual

disgust are distinct adaptive responses to different adaptive problems. As we hypothesize, dispositional pathogen (H1a) and moral (H1b) disgust will be positively related to intentions to engage in safe sex behavior. Perceived disgust will be positively related to intentions to engage in safe sex behavior (H3), and dispositional pathogen (H4a) and moral (H4b) disgust will be positively related to perceived disgust.

The explication of six factors of sexual disgust suggests a complex and nuanced construct, yet there is a need for more research examining the relationship between factors of sexual disgust and protective sexual behaviors. Accordingly, we hypothesize that intentions to engage in safe sex behavior will be positively related to all six dimensions of sexual disgust proposed by Crosby et al. (2020), including hygiene (H2a), oral (H2b), same sex (H2c), BDSM (H2d), taboo (H2e), and nonmonogamy (H2f). Similarly, perceived (or state-based) disgust is hypothesized to be positively related to all six dimensions of sexual disgust, including hygiene (H5a), oral (H5b), same sex (H5c), BDSM (H5d), taboo (H5e), and nonmonogamy (H5f).

Scholarship has demonstrated that pursuit of sexual assortment is related to lower average ratings of sexual disgust (Al-Shawaf et al., 2018; O'Shea et al., 2019), in contrast to those interested in committed relationships. As Crosby et al. (2020) argue, lower thresholds of sexual disgust “function to deter individuals from engaging in potentially risky sexual acts. Higher thresholds for activating this emotion, in contrast, allow individuals to pursue uncommitted sexual acts without being inhibited by the potential ramifications of risky sex” (p. 3). We hypothesize that message explicitness will be positively related to perceived disgust (H6a) and intentions to engage in safe sex behavior (H6b), as well as freedom threat (H8a), anger (H8b), counterarguing (H8c), and reactance (H8d).

Nevertheless, while scholarly interest in functional disgust has increased, Crosby et al. (2020) argue that the academic understanding of sexual disgust continues to be incomplete. To further delineate various gradations of sexual explicitness and move away from categorization based on experimenters' personal judgments, it is essential to create stimuli that allow valid, objective comparisons between these categories.

4. Disgust appeals and sexual explicitness

Disgust appeals have long been used to address health behaviors like smoking, drinking, and unhealthy food consumption by attempting to encourage attitudes and behavior change (Kemp, 2018). Lupton (2015), positing disgust appeals as central to public health messaging, conceptualizes a “pedagogy of disgust” (p. 6). This pedagogical model encompasses public health campaigns' use of disgust as a motivational tool by approaching campaigns' target audiences using authoritative voices. These appeals, thus, use powerful messages to trigger disgust, including in audiences that are hard to reach or change (Crawshaw, 2012; Gagnon et al., 2010). Nevertheless, such appeals are not uniform in their rates of success. Messages seeking to evoke an emotional response can backfire in the desired effects (e.g., reactance). An overlooked aspect of public health campaigns are the potential pleasures associated with transgressive behaviors. Particularly, in the context of sexual disgust, the lure of transgression must not be neglected. We hypothesize perceived disgust will mediate the relationship between message explicitness and intentions to engage in safe sex behavior such that more explicit messages will increase intentions via disgust (H7), and freedom threat and reactance will mediate the relationship between message explicitness and intentions to engage in safe sex behavior such that more explicit messages will decrease intentions via threat and reactance (H9).

Additionally, it is essential to recognize that disgust appeals typically affect most significantly those populations most psychologically or socially vulnerable. In direct opposition to desired effects of empowered decision making, those disempowered, distressed, or socio-economically disadvantaged are more likely to feel further powerlessness after exposure to these types of campaigns (Hastings et al., 2004; Van't Riet and

Ruiter, 2013). To this end, we endeavor to answer two major research questions – do individuals with less than a high school degree (RQ1a), males (RQ1b), or Republicans (RQ1c) respond differently to increased sexual explicitness? And, do more sexually explicit messages increase intentions for those with higher levels of dispositional pathogen (RQ2a), moral (RQ2b), or sexual disgust (RQ2c)?

5. Methodology

5.1. Procedures

Participants were recruited via Qualtrics Panels to complete an online survey that contained an embedded experiment comparing safe sex messages with low and high levels of explicit language. All participants received a kernel message that focused on safe sex behaviors during the COVID-19 pandemic. The kernel message did not include explicit sexual language or descriptions and functioned as the low explicit condition. The high explicit condition included the kernel message plus text focused on (a) sexual hygiene concerns, (b) same sex partners, or (c) oral sex. Thus, the experiment had a two-level explicitness factor with a nested topic factor (hygiene, same sex, or oral sex) in the latter (i.e., four conditions: low explicit, high explicit – sexual hygiene, high explicit – same sex partner, and high explicit – oral sex).

5.2. Participants

A total of 498 participants were included in the study. Participants were stratified by sex (female: 49.2%, $N = 245$) and education (high school education or less: 45.2%, $N = 225$). Participants had an average age of 43.42 years ($SD = 19.67$, Range: 18–76). The racial and ethnic composition of the sample is as follows: American Indian or Alaskan Native (4.4%, $N = 22$), Asian or Asian American (3.4%, $N = 17$), Black or African American (12.7%, $N = 63$), Hispanic or Latina/o (10%, $N = 50$), Native Hawaiian or Other Pacific Islander (0.6%, $N = 3$), White or Caucasian American (79.3%, $N = 395$), and Other/Unspecified (5.0%, $N = 25$).

GaPower (Faul et al., 2009) was utilized to estimate *a priori* power for the design. Strong power (0.80) for detecting effects ($f = 0.25$) could be achieved with a sample size of 128 for the primary contrast of interest (low vs. high explicitness). The obtained sample is, therefore, powered to detect medium sized effects ($N = 498$).

5.3. Stimuli

Stimuli were developed to reflect real-world messaging based on guidelines published by governmental agencies and non-profit organizations, including the World Health Organization, the American Sexual Health Organization, the San Francisco Department of Public Health, NYC Health, and Planned Parenthood. One message used language with low explicitness, referring to the physical intimacy between monogamous sexual partners in the abstract. The other three messages used high explicitness and reflected three of the domains of sexual disgust including (a) sexual hygiene concerns, (b) same sex partners, and (c) oral sex (Crosby et al., 2020).

As Crosby et al. (2020) operationalize sexual hygiene as a composite of two sexual behaviors (having sex with someone who has unpleasant body odor; and having sex with someone who has bad breath), operationalize same sex attraction as a composite of four sexual behaviors (male homosexuality; sex between two men; female homosexuality; and sex between two women), and operationalize oral sex as a composite of four sexual behaviors (a man performing oral sex on a woman; simultaneous oral sex (“69”); a woman performing oral sex on a man; and licking someone during sex), these high explicit messages include references to bodily fluids (“Anyone coughing, spitting, vomiting, and/or sneezing during sex can potentially spread the virus within a radius of several feet”), homosocial relationships (“If you decide to communicate

your sexual desires by means of phone calls, instant messages, explicit pictures, or video chats, be mindful of your own and your partner's emotional safety – especially if you cannot ascertain your partner's privacy, or if you or your partner are not out (yet)'), and specific sexual acts ("If you choose to engage in any form of oral sex with more than one simultaneous partner, be diligent about replacing condoms or dental dams whenever you come in contact with a different person").

These three domains were selected because they each represent a clear behavior that can be directly translated to stimuli and are relevant in the context of COVID-19. The other three categories proposed by Crosby et al. (2020) – taboo sex, nonmonogamous behavior, and BDSM – included numerous, distinct behaviors, making them more challenging to translate into stimuli that capture the entire category. For example, nonmonogamous behavior includes both participating in orgies and watching pornography, taboo sex includes incest, pedophilia, and necrophilia, among others, and BDSM includes a range of behaviors such as choking, whipping, and bondage. For full stimuli, see Appendix A.

6. Measures

6.1. Dispositional sexual disgust

Dispositional sexual disgust was measured using Crosby et al.'s (2020) multidimensional sexual disgust measure. Participants indicated how disgusting they found a variety of sexual acts on a scale from 1 (*not at all sexually disgusting*) to 7 (*extremely sexually disgusting*). The measure captured six domains of dispositional sexual disgust including: (a) taboo sex act (10 items; "Having sex with your sibling;" $\alpha = 0.99$, $M = 5.91$, $SD = 1.93$), (b) BDSM (7 items; "Whipping someone during sex;" $\alpha = 0.96$, $M = 4.21$, $SD = 2.22$), (c) sexual hygiene concerns (2 items; "Having sex with someone who has unpleasant body odor;" $\alpha = 0.89$, $M = 5.12$, $SD = 1.99$), (d) same sex partners (4 items; "Sex between two men;" $\alpha = 0.93$, $M = 3.73$, $SD = 2.26$), (e) nonmonogamous behavior (4 items; "Threesomes or sex involving three people;" $\alpha = 0.90$, $M = 4.02$, $SD = 2.11$), and (f) oral sex (4 items; "Simultaneous oral sex ('69');" $\alpha = 0.93$, $M = 2.69$, $SD = 1.95$).

6.2. Dispositional pathogen and moral disgust

Dispositional pathogen and moral disgust were measured using Tybur et al.'s (2009) measures of pathogen disgust (7 items; "Accidentally touching a person's bloody cut;" $\alpha = 0.92$, $M = 5.22$, $SD = 1.62$) and moral disgust (7 items; "Stealing from a neighbor;" $\alpha = 0.95$, $M = 5.62$, $SD = 1.69$). Participants indicated on a scale from 0 (*not at all disgusting*) to 6 (*extremely disgusting*) how disgusting they typically found each item.

6.3. State-based disgust

State-based disgust was measured using four items derived from Shen (2010) and Gray and Wegner (2012). Participants indicated on a scale from 1 (*none of this emotion*) to 7 (*a great deal of this emotion*) how strongly the message made them feel "sickened," "unnerved," "disgusted," and "uneasy" ($\alpha = 0.94$, $M = 3.21$, $SD = 1.89$).

6.4. Freedom threat

Freedom threat was measured using Dillard and Shen's (2005) four-item freedom threat measure. Participants indicated how much they agreed the message was trying to manipulate them on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Sample items include "the message tried to manipulate me" and "the message threatened my freedom to choose" ($\alpha = 0.94$, $M = 2.44$, $SD = 1.10$).

6.5. Reactance

Reactance was measured using both a cognitive and an affective

component. The cognitive component was measured on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*) using five items based on Nabi et al. (2007). Sample items include: "I found myself disagreeing with the message" and "I was looking for flaws in the message." The affective component was measured using four items from Dillard and Shen (2005). Participants indicated on a scale from 1 (*none of this emotion*) to 7 (*a great deal of this emotion*) how strongly the message made them feel "irritated," "aggravated," "annoyed," and "angry." A latent reactance variable was created in SPSS to account for both the cognitive and affective aspects ($\alpha = 0.85$, $M = 0.02$, $SD = 1.00$, Range: -1.43 to 2.41).

6.6. Safe sex intentions

Safe sex intentions were measured using three items modeled after Mausbach et al.'s (2009) and Fisher et al.'s (1998) safer sex intentions measures. Participants were briefly reminded of what safe sex during a pandemic meant with the statement: "The message you read outlined several behaviors including have sex with a long-term partner, masks/safety devices, and/or long distance sexual interactions." Participants then responded to three items on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) including "I intend to practice safe sex behavior during the COVID pandemic," "I plan to engage in safe sex behavior during the COVID pandemic," and "I will adhere to safe sex guidelines during the COVID pandemic" ($\alpha = 0.91$, $M = 4.75$, $SD = 1.85$).

7. Results

Bivariate Correlations. Table 1 reports bivariate relationships between all study variables. H1a and H1b were both supported as pathogen ($r = 0.29$, $p < .001$) and moral ($r = 0.30$, $p < .001$) disgust were positively related to intentions. H2a, H2d, H2e, and H2f were supported as hygiene ($r = 0.25$, $p < .001$), BDSM ($r = 0.18$, $p < .001$), taboo ($r = 0.28$, $p < .001$), and nonmonogamy ($r = 0.15$, $p < .001$) disgust were all positively related to intentions. Two sexual disgust dimensions were not related to intentions: oral disgust ($r = 0.05$, $p = .231$) and same sex disgust ($r = 0.08$, $p = .063$). Table 2 reports which hypotheses and sub-hypotheses were supported by the study findings.

Consistent with H3, perceived disgust was positively related to safe sex intentions ($r = 0.10$, $p = .024$). Pathogen ($r = 0.29$, $p < .001$) and moral ($r = 0.30$, $p < .001$) disgust were positively related to perceived disgust (support for H4a/b). Likewise, hygiene ($r = 0.17$, $p < .001$), oral ($r = 0.30$, $p < .001$), same sex ($r = 0.26$, $p < .001$), BDSM ($r = 0.27$, $p < .001$), and nonmonogamy ($r = 0.30$, $p < .001$) disgust were all positively related to perceived disgust (support for H5a-d, H5f). One sexual disgust dimension was not related to perceived disgust: taboo disgust ($r = 0.01$, $p = .789$).

Thus, there was strong support for the idea that dispositional disgust, perceived disgust, and safe sex intentions were related.

Main Effects and Demographic Moderators. Message explicitness was hypothesized to increase perceived disgust (H6a), intentions to engage in safe sex (H6b), and psychological reactance measures (H8a-d). Education, sex, and political party were positioned as possible moderators (RQ1a-c). To examine these hypotheses and research questions, a multivariate analysis of variance (MANOVA) was carried out with message explicitness, sex, education, and political party as fixed factors and intentions, perceived disgust, critical reflection, veracity, novelty, memorability, importance, freedom threat, anger, counterarguing, and reactance as the outcomes. The multivariate test was significant for explicitness, Pillai's trace = 0.046, $F(11, 467) = 2.042$, $p = .023$, and education, Pillai's trace = 0.050, $F(11, 467) = 2.241$, $p = .012$. An examination of the univariate relationships (see Table 3) revealed that message explicitness significantly increased perceived disgust, $F(1,477) = 5.13$, $p = .024$, freedom threat, $F(1,477) = 7.60$, $p = .006$, anger, $F(1,477) = 8.22$, $p = .004$, and reactance, $F(1,477) = 6.81$, $p = .009$ (support for H6a, H8a, H8b, H8d). Education was positively related to

Table 1
Bivariate correlation matrix.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Safe Sex Behavior	–													
2. Perceived Disgust	.10*	–												
3. SDI - Hygiene	.25*	.17*	–											
4. SDI - Oral	.05	.30*	.17*	–										
5. SDI - SameSex	.08	.26*	.39*	.44*	–									
6. SDI - BDSM	.18*	.27*	.47*	.45*	.65*	–								
7. SDI - Taboo	.28*	.01	.71*	.00	.31*	.42*	–							
8. SDI - Promiscuity	.15*	.30*	.45*	.53*	.66*	.65*	.37*	–						
9. Pathogen Disgust	.29*	.12*	.51*	.06	.23*	.26*	.44*	.24*	–					
10. Moral Disgust	.30*	.12*	.44*	.00	.24*	.34*	.49*	.28*	.65*	–				
11. Sex	.02	.01	.06	.08	–.07	–.09	.01	.16*	.06	–.05	–			
12. Education	.13*	.06	.09*	.06	.12*	.21*	.11*	.09	.05	.16*	–.07	–		
13. age	.19*	.10*	.16*	.11*	.34*	.45*	.15*	.22*	.18*	.34*	–.17*	.33*	–	
14. Race	.10*	.08	.17*	–.05	.08	.11*	.21*	.11*	.14*	.27*	.00	.15*	.34*	–
15. Political Party	.08	–.15*	–.08	.01	–.21*	–.12*	–.05	–.06	–.02	–.08	.06	–.10*	–.14*	–.22*

Note. Bivariate correlations between study variables ($N = 498$). Sex: male (0), female (1); Education: high school or less (0), more than high school (1); Race: not White (0), White (1); Political party: Republican (0), Democrat (1).

* $p < .05$.

Table 2
Support for hypotheses and sub-hypotheses.

H1a: Dispositional pathogen disgust will be positively related to intentions to engage in safe sex behavior.	Supported
H1b: Moral disgust will be positively related to intentions to engage in safe sex behavior.	Supported
H2a: The “hygiene” dimension of sexual disgust will be positively related to intentions to engage in safe sex behavior.	Supported
H2b: The “oral” dimension of sexual disgust will be positively related to intentions to engage in safe sex behavior.	Not supported
H2c: The “same sex” dimension of sexual disgust will be positively related to intentions to engage in safe sex behavior.	Not supported
H2d: The “BDSM” dimension of sexual disgust will be positively related to intentions to engage in safe sex behavior.	Supported
H2e: The “taboo” dimension of sexual disgust will be positively related to intentions to engage in safe sex behavior.	Supported
H2f: The “promiscuity”/“nonmonogamy” dimension of sexual disgust will be positively related to intentions to engage in safe sex behavior.	Supported
H3: Perceived disgust will be positively related to intentions to engage in safe sex behavior.	Supported
H4a: Dispositional pathogen disgust will be positively related to perceived disgust.	Supported
H4b: Moral disgust will be positively related to perceived disgust.	Supported
H5a: The “hygiene” dimension of sexual disgust will be positively related to perceived disgust.	Supported
H5b: The “oral” dimension of sexual disgust will be positively related to perceived disgust.	Supported
H5c: The “same sex” dimension of sexual disgust will be positively related to perceived disgust.	Supported
H5d: The “BDSM” dimension of sexual disgust will be positively related to perceived disgust.	Supported
H5e: The “taboo” dimension of sexual disgust will be positively related to perceived disgust.	Not supported
H5f: The “promiscuity”/“nonmonogamy” dimension of sexual disgust will be positively related to perceived disgust.	Supported
H6a: Message explicitness will be positively related to perceived disgust.	Supported
H6b: Message explicitness will be positively related to intentions to engage in safe sex behavior.	Not supported
H7: Perceived disgust will mediate the relationship between message explicitness and intentions to engage in safe sex behavior such that more explicit messages will increase intentions via disgust.	Supported
H8a: Message explicitness will be positively related to freedom threat.	Supported
H8b: Message explicitness will be positively related to anger.	Supported
H8c: Message explicitness will be positively related to counterarguing.	Not supported
H8d: Message explicitness will be positively related to reactance.	Supported
H9: Freedom threat and reactance will mediate the relationship between message explicitness and intentions to engage in safe sex behavior such that more explicit messages will decrease intentions via threat and reactance.	Supported

Table 3
Main effects of message explicitness and education.

	Explicitness			Education		
	Low	High	F	HS or less	More than HS	F
Safe Sex Behavior	4.82 (.17)	4.70 (.10)	.35	4.56 (.15)	4.96 (.12)	4.08*
Perceived Disgust	2.90 (.17)	3.35 (.10)	5.13*	3.07 (.16)	3.18 (.13)	.30
Critical Reflection	3.34 (.10)	3.26 (.06)	.56	3.31 (.09)	3.29 (.07)	.05
Veracity	4.28 (.18)	4.55 (.10)	1.81	4.14 (.16)	4.70 (.13)	7.60**
Novelty	3.95 (.15)	4.21 (.09)	2.14	3.85 (.14)	4.30 (.11)	6.37*
Memorability	4.12 (.17)	4.36 (.10)	1.42	3.94 (.15)	4.53 (.12)	9.04**
Importance	4.66 (.17)	4.53 (.10)	.39	4.22 (.16)	4.96 (.13)	13.92***
Freedom Threat	2.20 (.10)	2.52 (.06)	7.60**	2.27 (.09)	2.45 (.07)	2.48
anger	2.50 (.19)	3.12 (.11)	8.22**	2.86 (.17)	2.77 (.14)	.18
Counterarguing	2.63 (.07)	2.68 (.04)	.53	2.68 (.06)	2.63 (.05)	.46
Reactance	–.18 (.10)	.10 (.05)	6.81**	–.03 (.08)	–.06 (.07)	.05
N	138	355		224	269	

Note. Means, standard errors (in parentheses), and F -tests reported for the main effects of message explicitness and education.

$p < .05$, ** $p < .01$, *** $p < .001$.

safe sex intentions, $F(1,477) = 4.08$, $p = .044$, message veracity, $F(1,477) = 7.60$, $p = .006$, novelty, $F(1,477) = 6.37$, $p = .012$, memorability, $F(1,477) = 9.04$, $p = .003$, and importance, $F(1,477) = 13.92$, $p < .001$.

Indirect Path Via Perceived Disgust. Path analysis (PROCESS, see Hayes, 2018) was utilized to test indirect pathways. Consistent with H7, message explicitness was positively related to intentions via perceived disgust, $r = 0.04$, boot $SE = 0.03$, 90% CI: 0.0024, 0.0920. Message explicitness increased disgust, $r = 0.39$, $SE = 0.19$, $t = 2.07$, $p = .04$, which was positively related to intentions, $r = 0.10$, $SE = 0.04$, $t = 2.33$, $p = .02$ (see Fig. 1a).

Indirect Path Via Reactance. Consistent with H9, message explicitness was negatively related to intentions via freedom threat and reactance, $r = -0.04$, boot $SE = 0.03$, 90% CI: –0.0902, –0.0053. Message explicitness increased freedom threat, $r = 0.30$, $SE = 0.11$, $t = 2.72$, $p = .007$, which was positively related to reactance, $r = 0.59$, $SE = 0.03$, $t = 19.22$,

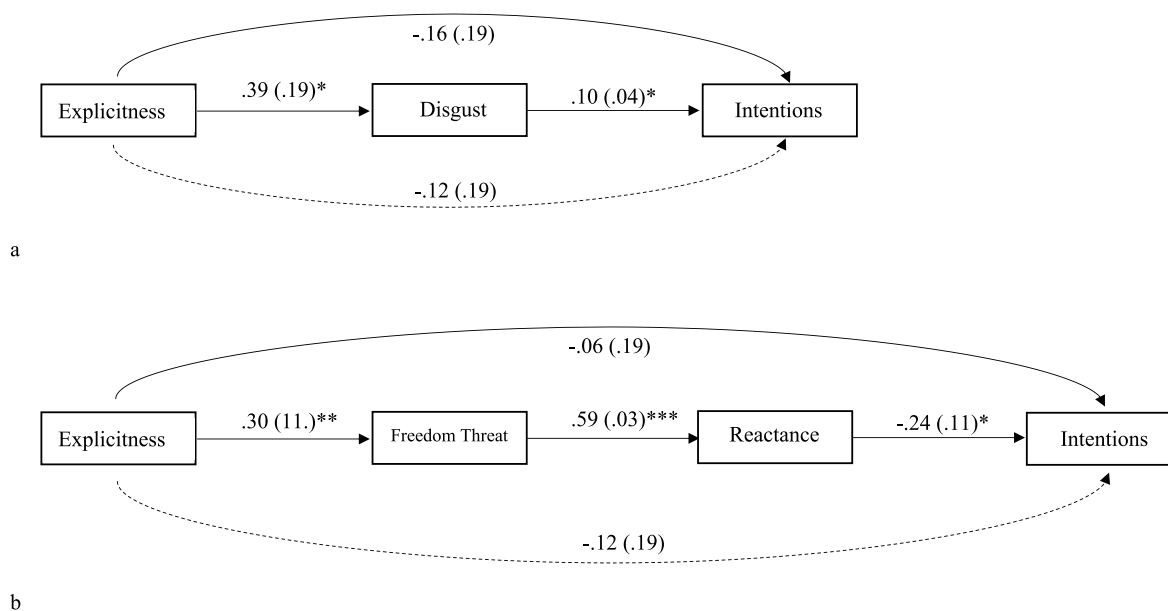


Fig. 1. Indirect pathways. * $p < .05$, ** $p < .01$, *** $p < .001$ (a) Indirect pathway through perceived disgust.(b) Indirect serial pathway through freedom threat and reactance.

$p < .001$, and that, in turn, was negatively related to intentions, $r = -0.24$, $SE = 0.11$, $t = -2.12$, $p = .03$ (see Fig. 1b).

Dispositional Disgust Moderators. Three research questions (RQ2a-c) asked whether dispositional disgust (pathogen, moral, or sexual disgust) moderated the relationship between message explicitness and safe sex intentions.

SDI – hygiene disgust significantly moderated the relationship between message explicitness and safe sex intentions, R^2 change = 0.01, $F(1, 490) = 6.13$, $p = .01$. An examination of the Johnson-Neyman regions of significance revealed a positive relationship between message explicitness and intentions for those with hygiene disgust at or below 3.0520 (approximately 16.97% of the sample) and a negative relationship for those at or above 6.4731 (approximately 42.63% of the sample; see Table 4).

The relationship between message explicitness and safe sex intentions was not moderated by pathogen disgust, R^2 change = 0.0014, $F(1, 490) = 0.75$, $p = .39$, moral disgust, R^2 change = 0.0018, $F(1, 490) = 0.98$, $p = .32$, oral disgust, R^2 change = 0.0032, $F(1, 490) = 1.59$, $p = .21$, same sex disgust, R^2 change = 0.0001, $F(1, 490) = 0.03$, $p = .86$, BDSM disgust, R^2 change = 0.0004, $F(1, 490) = 0.22$, $p = .64$, taboo disgust, R^2 change = 0.0070, $F(1, 490) = 3.77$, $p = .05$, nonmonogamy disgust, R^2 change = 0.0050, $F(1, 490) = 2.54$, $p = .11$.

Three contrast variables were created comparing the low explicit message to each of the specific high explicit conditions (hygiene, oral, and same sex). A follow-up analysis was carried out examining whether hygiene, oral, and same sex disgust moderated the relationship between the parallel contrast variable and safe sex behavior. For example, whether hygiene disgust moderated the relationship between the hygiene contrast variable (low explicit vs. high explicit – hygiene) and safe sex behavior. Hygiene disgust significantly moderated the relationship, R^2 change = 0.02, $F(1, 243) = 4.83$, $p = .03$. The pattern was identical to before with more explicit hygiene messages triggering increased safe sex intentions for those with lower dispositional hygiene disgust (scores at or below 2.2000). No significant moderation emerged for oral disgust, R^2 change = 0.0052, $F(1, 264) = 1.38$, $p = .24$, or same sex disgust, R^2 change = 0.0004, $F(1, 251) = 0.12$, $p = .73$.

8. Discussion

The elicitation of disgust is an essential part of communicating health

Table 4 Johnson-neyman probe of hygiene disgust interaction.

Model Summary						
R	R ²	MSE	F	df1	df2	p
.2899	.0840	3.1756	11.2367	4.0000	490.00	.0000
	r	SE	t	p	LLCI	ULCI
constant	2.4987	.4688	5.3295	.0000	1.7261	3.2713
Explicit	1.1642	.5261	2.2131	.0274	.2973	2.0311
Hygiene	.3999	.0824	4.8554	.0000	.2642	.5356
Int_1	-.2343	.0947	-2.4753	.0136	-.3903	-.0783
Education	.4036	.1618	2.4941	.0130	.1369	.6702
Moderator value(s) defining Johnson-Neyman significance region(s):						
Value	% below	% above				
3.0520	16.9697	83.0303				
6.4731	57.3737	42.6263				
Hygiene	r	SE	t	p	LLCI	ULCI
1.0000	.9299	.4382	2.1222	.0343	.2078	1.6521
1.3000	.8596	.4124	2.0843	.0376	.1800	1.5393
1.6000	.7893	.3870	2.0395	.0419	.1515	1.4271
1.9000	.7191	.3621	1.9860	.0476	.1224	1.3157
2.2000	.6488	.3376	1.9214	.0553	.0923	1.2052
2.5000	.5785	.3139	1.8429	.0660	.0612	1.0958
2.8000	.5082	.2910	1.7464	.0814	.0286	.9877
3.0520	.4491	.2725	1.6480	.1000	.0000	.8983
3.1000	.4379	.2691	1.6271	.1044	-.0056	.8814
3.4000	.3676	.2486	1.4788	.1398	-.0421	.7773
3.7000	.2973	.2297	1.2942	.1962	-.0813	.6759
4.0000	.2270	.2130	1.0659	.2870	-.1240	.5780
4.3000	.1567	.1989	.7879	.4311	-.1711	.4845
4.6000	.0864	.1881	.4595	.6461	-.2236	.3964
4.9000	.0161	.1811	.0892	.9290	-.2824	.3147
5.2000	-.0541	.1785	-.3033	.7618	-.3483	.2400
5.5000	-.1244	.1803	-.6901	.4905	-.4216	.1727
5.8000	-.1947	.1865	-1.0441	.2969	-.5021	.1126
6.1000	-.2650	.1966	-1.3478	.1783	-.5890	.0590
6.4000	-.3353	.2101	-1.5957	.1112	-.6816	.0110
6.4731	-.3524	.2139	-1.6480	.1000	-.7049	.0000
6.7000	-.4056	.2264	-1.7914	.0738	-.7787	-.0325
7.0000	-.4759	.2449	-1.9431	.0526	-.8795	-.0723

Note. Moderation of message explicitness and safe sex intentions by dispositional hygiene disgust. Int_1 is the interaction between explicitness and hygiene.

information and risk. Whereas the role of disgust in protecting against harm has been extensively investigated within the fields of psychology and evolutionary biology, the role of sexual disgust remains understudied. Tybur et al. (2009, 2013) moved against previous monolithic conceptualizations of disgust, proposing the division of disgust elicitors into three domains – pathogen, sexual, and moral transgressions. However, as Crosby et al. (2020) underline, the multidimensionality of sexual disgust was misrepresented, as its reduction to a singular dimension neglects individual qualitative differences in sociosexual orientation. Proposing a six-factor organization of sexual disgust elicitors, the authors call for the examination of the extent to which these dimensions reflect unique evolved adaptations. To delineate various gradations of sexual explicitness and move away from categorizations based on experimenters' personal judgments, scholars must create stimuli that allow objective comparisons between these categories. This study answers Crosby and colleagues' call, contributing to the literature on safe-sex intentions and reactance.

Multiple types of dispositional disgust were positively related to intentions to engage in safe sex behavior. This finding is in line with parasite stress theory, which holds that dispositional disgust influences behavior during heightened pathogenic threat. However, none of the dispositions moderated audience response to sexually explicit messages, which suggests there may be a need for modification of the theory, measurement, or stimuli. Concerning the latter, visual depictions of different sexual behaviors, rather than textual descriptions, may be more prone to trigger response based on underlying dispositional disgust. In the current study, safe sex intentions did not vary across conditions; nevertheless, more explicit messages did reduce safe sex intentions indirectly via freedom threat and reactance. Identifying message approaches that reduce freedom threat is a primary goal for future work.

As hypothesized, we found that message explicitness is significantly related to participants' response to safe sex messages, with high explicit language increasing perceived disgust and psychological reactance measures. Consistent with our hypothesis that perceived disgust mediates the relationship between message explicitness and intentions to engage in safe sex behavior, we found that increased sexual explicitness positively relates to intentions via perceived disgust, triggering increased disgust positively related to intentions. Consistent with our hypothesis that freedom threat and reactance mediate the relationship between message explicitness and intentions to engage in safe sex behavior, we found that message explicitness is negatively related to intentions via freedom threat and reactance; message explicitness increases freedom threat, positively related to reactance, which negatively relates to intentions. Message explicitness significantly increases perceived disgust, freedom threat, anger, and reactance. Similarly, respondents' levels of education were found to positively relate to safe sex intentions, message veracity, novelty, memorability, and importance. Hygiene disgust significantly moderates the relationship between message explicitness and safe sex intentions. However, this relationship is not moderated by the specific high explicit conditions of oral disgust and same sex disgust. Similarly, neither pathogen disgust, moral disgust, BDSM disgust, taboo disgust, nor nonmonogamy disgust moderate the relationship between the parallel contrast variable and safe sex behavior.

The results of the study suggest that there is theoretical support through two different pathways. First, consistent with the parasite stress theory, perceived disgust mediated the relationship between message explicitness and intentions. Second, perceived disgust had a negative indirect effect consistent with psychological reactance theory through freedom threat and reactance. However, these findings also hint towards the complexity of utilizing disgust appeals, because it serves as a difficult affective trigger which can yield conflicting pathways. Moreover, the current findings are reminiscent of dual pathway models found in fear appeals and psychological research. Patrick et al. (1994) contributed to this logic by finding that dual processes relating to fear appeals are more complex, rather than having a single low-fear pathway that accounted

for all aspects of people's behavior. From a theoretical perspective, the findings suggest that a possible future direction is to evolve disgust theories towards dual pathways akin to fear appeal research situated within the extended parallel process model (Witte, 1992). Alternatively, researchers could explore ways to utilize explicitness and disgust without having a negative reactance path. In other words, future research could identify moderators or message features which more consistently elicit positive disgust effects without negative baggage.

Hygiene disgust emerged as a crucial moderator to consider when developing future persuasive messaging. Hygiene disgust moderated such that lower disgust individuals were positively influenced by message explicitness. Therefore, lower disgust individuals were more likely to engage in safe sex practices or behaviors when given a higher explicit message. Individuals with higher hygiene disgust were turned off by the message and chose not to engage with it at all, which means that lower hygiene disgust individuals seem to be less sensitive to disgust appeals, allowing them to process the information and be more influenced by the messaging. These findings counter what is suggested by the parasite stress hypothesis, which argues that high disgust individuals will be more sensitive to disgust, leading them to be more proactive in protecting themselves from the triggering disgust appeals found in the messaging. This leads us to some crucial implications. These findings suggest that there is a possibility that people are evolving towards being less sensitive to disgust appeals, allowing them to be more accurate in their response to them. This further argues that people who are too sensitive towards disgust appeals trigger its messaging in a negative way, which does not allow them to properly process the information. In other words, are humans gravitating towards becoming thicker skinned over time so that they are not reacting to persuasive messaging falsely?

Another important finding within our study was the skew of our disgust measures in response to dispositional disgust. We found no great variation in disgust responses; respondents, when prompted with disgust stimuli, did report being disgusted on the self-reported scale. With this skew towards higher dispositional disgust, it was difficult to determine if the survey response was truly due to respondents' disgust responses, or if the survey response was due to response-pattern behavior (Bais et al., 2020). Quick responses in surveys tend to reflect response-pattern behaviors, where respondents will select the same response for each item, and with our survey design, dispositional disgust responses could have elicited this potential patterned behavior. This was typically seen with the majority of responses to our dispositional disgust items, being rated consistently as very disgusting or extremely disgusting, especially for items with more universal perceived disgust, like sex with animals. More research will be required to delineate between the variance in sexual disgust responses. That is, disgust stimuli messages should use more variation in wording or visual features to determine if dispositional disgust truly holds or falls towards response-patterned behaviors in survey answers.

The current study was limited in several ways. First, the message experiment examined response to a single kernel message. Future scholarship must explore the extent to which our findings and conclusions translate to alternative sexually explicit messages, as well as message explicitness more broadly. Furthermore, our findings are fundamentally contingent to the COVID-19 pandemic, beckoning the question of the extent to which our findings will translate to a post-pandemic context. Theoretically and methodologically, our study is rooted within very young measures. We position our findings at the cutting edge of sexual disgust scholarship, contributing to greater understanding of sexual disgust as a distinct category and investigating the practical moderation of the various dimensions theorized as comprising sexual disgust. Nevertheless, a future follow-up study will be required to reflect further refinement of these measures.

One of our goals in this manuscript was operationalizing the factors within the sexual disgust inventory (Crosby et al., 2020). As drawing boundaries between sexual behaviors is challenging, this operationalization leads to confounds. For example, in their survey instrument,

Crosby et al. (2020) operationalize “promiscuity” as a composite of four sexual behaviors: Group sex or orgies; agreement between partners to have sex with people outside of the committed relationship (“swinging”); threesomes or sex involving three people; and watching pornography. As pornographic content may well include other factors triggering sexual disgust – such as depictions of oral sex, BDSM, or same-sex relations – clear delineation becomes untenable. Similarly, “swinging” may be considered by some as “taboo” rather than as “promiscuous.” Consequently, future scholarship will need to revisit, critique, and potentially revise Crosby et al.’s (2020) sexual disgust inventory to address potential confounds in the six proposed dimensions.

Furthermore, we want to acknowledge the problematic associations of the term “promiscuity” with the promotion and perpetuation of stigma. As the term is operationalized as a composite of four sexual behaviors in Crosby et al.’s (2020) survey instrument, we were hesitant to deviate from the authors’ chosen terminology. Nevertheless, we do recognize the problematic connotations of the term, and propose “nonmonogamy” as a more neutral, less moralistic alternative. We invite future scholarship to be similarly critical of the heteronormative vocabulary most prevalent in discourse surrounding sexual behaviors and sociosexual attitudes.

Most significantly, this study has explicated how differing levels of sexual explicitness and sexual disgust can be used to impact audience response to sexual health messages and policy instruments within the contexts of the COVID-19 pandemic, contributing to scholarship on the uses and gratifications of sexually explicit media. Explicit sexual

messages affect consumers’ individual sociosexual attitudes, underlining the importance of recognizing the qualitatively distinct dimensions of sexual disgust. Particularly, we posit the further refinement of the theorization and measurement of the various dimensions of sexual disgust vis-à-vis the various gradations of sexual explicitness as a worthwhile program of future study.

Credit author statement

Sebastian Gorissen: Conceptualization; Methodology; Investigation; Writing – original draft; Writing – review & editing Helen M. Lillie: Conceptualization; Methodology; Writing – original draft Daniel Chavez-Yenter: Conceptualization; Writing – original draft Alexis Vega: Conceptualization; Writing – original draft Kevin K. John: Conceptualization; Formal analysis; Writing – original draft Jakob D. Jensen: Conceptualization; Data curation; Formal analysis; Funding acquisition

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A

Low Explicit: Control



Transmission/COVID-19 is a respiratory disease, primarily spread through direct contact with respiratory droplets from the nose and mouth. There is a significant risk of passing on COVID-19 through kissing and physical touching if one person has the virus, which raises questions regarding the safety of physical intimacy. While COVID-19 has not yet been found in vaginal fluid, it has been found in feces and semen of people who are infected. Condoms and dental dams reduce contact with infectious droplets, but these items cannot entirely protect against COVID-19, as any contact with infectious droplets can transmit the virus.

Risk of infection/as you are your own safest sex partner, you and your partner may choose to masturbate together, using physical distance and

face coverings to reduce the risks of infection while engaging in joint physical intimacy. Do make sure to properly wash your hands with soap and water for at least 20 s before and after your sexual activity. To truly abide by social distancing recommendations, you may choose to communicate your sexual desires to a partner who does not live with you, by means of phone calls, instant messages, explicit pictures, or video chats. Consensual virtual connections over the phone or on web platforms can be excellent ways to interact socially and sexually without exposing anyone to the risks of infection.

The next safest option is sexual intercourse with someone already living with you, provided that person is equally committed to following all guidelines to reduce their potential exposure to COVID-19. Make sure to communicate as openly as possible with your partner about your levels of comfort to create a game plan on how you can continuously limit your risk for COVID-19.

If you choose to be physically intimate with anyone outside of your household, it is important to remain mindful of the added risks. The fewer people to which we are exposed, the lower the risk of getting COVID-19. as is the case with sexually transmitted infections, you share the risk of the person with whom you are close, as well as the risks of all the people with whom that person is close. Sexual health experts suggest finding a stable partner as a way of reducing the risk of getting COVID-19.

Conclusion/There are ways to have intimate contact and remain connected with your partner, but it is important to be mindful of the risks. To this end, consider using these harm reduction strategies to reduce risk, and make sure to communicate openly about both safety and boundaries with your partner.

High Explicit: Hygiene



Transmission/COVID-19 is a respiratory disease, primarily spread through direct contact with respiratory droplets from the nose and mouth. There is a significant risk of passing on COVID-19 through kissing and physical touching if one person has the virus, which raises questions regarding the safety of physical intimacy. While COVID-19 has not yet been found in vaginal fluid, it has been found in feces and semen of people who are infected. Condoms and dental dams reduce contact with infectious droplets, but these items cannot entirely protect against COVID-19, as any contact with infectious droplets can transmit the virus.

Risk of infection/as you are your own safest sex partner, you and your partner may choose to masturbate together, using physical distance and face coverings to reduce the risks of infection while engaging in joint physical intimacy. Do make sure to properly wash your hands with soap and water for at least 20 s before and after your sexual activity. To truly abide by social distancing recommendations, you may choose to communicate your sexual desires to a partner who does not live with you, by means of phone calls, instant messages, explicit pictures, or video chats. Consensual virtual connections over the phone or on web platforms can be excellent ways to interact socially and sexually without exposing anyone to the risks of infection.

The next safest option is sexual intercourse with someone already living with you, provided that person is equally committed to following all guidelines to reduce their potential exposure to COVID-19. Make sure to communicate as openly as possible with your partner about your levels of comfort to create a game plan on how you can continuously limit your risk for COVID-19.

If you choose to be physically intimate with anyone outside of your household, it is important to remain mindful of the added risks. The fewer people to which we are exposed, the lower the risk of getting COVID-19. as is the case with sexually transmitted infections, you share the risk of the person with whom you are close, as well as the risks of all the people with whom that person is close. Sexual health experts suggest finding a stable partner as a way of reducing the risk of getting COVID-19.

as heavy breathing and panting can spread the virus further, wearing a face covering that covers your nose and mouth is a good way to add a layer of protection during sex. Do make sure to clean all sex toys and accessories – COVID-19 can be transmitted by touching a surface or object that has the

virus on it. anyone coughing, spitting, vomiting, and/or sneezing during sex can potentially spread the virus within a radius of several feet. The timing of wiping down and cleaning shared objects is important, too, as it is essential to clean them thoroughly after they touch one body and before they touch another.

Conclusion/There are ways to have intimate contact and remain connected with your partner, but it is important to be mindful of the risks. To this end, consider using these harm reduction strategies to reduce risk, and make sure to communicate openly about both safety and boundaries with your partner.

High Explicit: Same Sex



Transmission/COVID-19 is a respiratory disease, primarily spread through direct contact with respiratory droplets from the nose and mouth. There is a significant risk of passing on COVID-19 through kissing and physical touching if one person has the virus, which raises questions regarding the safety of physical intimacy. While COVID-19 has not yet been found in vaginal fluid, it has been found in feces and semen of people who are infected. Condoms and dental dams reduce contact with infectious droplets, but these items cannot entirely protect against COVID-19, as any contact with infectious droplets can transmit the virus.

Risk of infection/as you are your own safest sex partner, you and your partner may choose to masturbate together, using physical distance and face coverings to reduce the risks of infection while engaging in joint physical intimacy. Do make sure to properly wash your hands with soap and water for at least 20 s before and after your sexual activity. To truly abide by social distancing recommendations, you may choose to communicate your sexual desires to a partner who does not live with you, by means of phone calls, instant messages, explicit pictures, or video chats. Consensual virtual connections over the phone or on web platforms can be excellent ways to interact socially and sexually without exposing anyone to the risks of infection.

The next safest option is sexual intercourse with someone already living with you, provided that person is equally committed to following all guidelines to reduce their potential exposure to COVID-19. Make sure to communicate as openly as possible with your partner about your levels of comfort to create a game plan on how you can continuously limit your risk for COVID-19.

If you choose to be physically intimate with anyone outside of your household, it is important to remain mindful of the added risks. The fewer people to which we are exposed, the lower the risk of getting COVID-19. as is the case with sexually transmitted infections, you share the risk of the person with whom you are close, as well as the risks of all the people with whom that person is close. Sexual health experts suggest finding a stable partner as a way of reducing the risk of getting COVID-19.

If you decide to communicate your sexual desires by means of phone calls, instant messages, explicit pictures, or video chats, be mindful of your own and your partner's emotional safety – especially if you cannot ascertain your partner's privacy, or if you or your partner are not out (yet). If you do choose to engage in in-person sexual activities, make sure to clean any and all sex toys and accessories, especially those you and a partner use simultaneously, such as vibrators or double-penetration dildos. Furthermore, it is important to communicate openly and candidly about COVID-19 risk factors with all partners, just as you would discuss PrEP, condoms, and other safer sex topics.

Conclusion/There are ways to have intimate contact and remain connected with your partner, but it is important to be mindful of the risks. To this end, consider using these harm reduction strategies to reduce risk, and make sure to communicate openly about both safety and boundaries with your partner.

High Explicit: Oral

Is Safe Sex Possible During COVID-19?



Transmission/COVID-19 is a respiratory disease, primarily spread through direct contact with respiratory droplets from the nose and mouth. There is a significant risk of passing on COVID-19 through kissing and physical touching if one person has the virus, which raises questions regarding the safety of physical intimacy. While COVID-19 has not yet been found in vaginal fluid, it has been found in feces and semen of people who are infected. Condoms and dental dams reduce contact with infectious droplets, but these items cannot entirely protect against COVID-19, as any contact with infectious droplets can transmit the virus.

Risk of infection/as you are your own safest sex partner, you and your partner may choose to masturbate together, using physical distance and face coverings to reduce the risks of infection while engaging in joint physical intimacy. Do make sure to properly wash your hands with soap and water for at least 20 s before and after your sexual activity. To truly abide by social distancing recommendations, you may choose to communicate your sexual desires to a partner who does not live with you, by means of phone calls, instant messages, explicit pictures, or video chats. Consensual virtual connections over the phone or on web platforms can be excellent ways to interact socially and sexually without exposing anyone to the risks of infection.

The next safest option is sexual intercourse with someone already living with you, provided that person is equally committed to following all guidelines to reduce their potential exposure to COVID-19. Make sure to communicate as openly as possible with your partner about your levels of comfort to create a game plan on how you can continuously limit your risk for COVID-19.

If you choose to be physically intimate with anyone outside of your household, it is important to remain mindful of the added risks. The fewer people to which we are exposed, the lower the risk of getting COVID-19. as is the case with sexually transmitted infections, you share the risk of the person with whom you are close, as well as the risks of all the people with whom that person is close. Sexual health experts suggest finding a stable partner as a way of reducing the risk of getting COVID-19.

Whenever you choose to engage in any form of oral sex, be particularly mindful about using preventative barrier methods. Do remember that these preventative barrier methods alone cannot entirely protect against COVID-19 – the risks of transmission warrant extra attention to washing up before and after engaging in sexual activities. If you choose to engage in any form of oral sex with more than one simultaneous partner, be diligent about replacing condoms or dental dams whenever you come in contact with a different person.

Conclusion/There are ways to have intimate contact and remain connected with your partner, but it is important to be mindful of the risks. To this end, consider using these harm reduction strategies to reduce risk, and make sure to communicate openly about both safety and boundaries with your partner.

References

- Ackerman, J.M., Tyber, J.M., Blackwell, A.D., 2021. What role does pathogen-avoidance psychology play in pandemics? *Trends Cognit. Sci.* 25 (3), 177–186.
- Allen, M., D'Alessio, D., Brezgel, K., 1995. A meta-analysis summarizing the effects of pornography II: aggression after exposure. *Hum. Commun. Res.* 22, 258–283.
- Al-Shawaf, L., Lewis, D.M., Buss, D.M., 2018. Sex differences in disgust: why are women more easily disgusted than men? *Emotion Review* 10 (2), 149–160.
- Andrews, A.R., Travis, C., Cholka, B.C., Cooper, V.T., Bridges, J.A., 2015. Correlational and experimental analyses of the relation between disgust and sexual arousal. *Motiv. Emot.* 39 (5), 766–779.
- Angyal, A., 1941. Disgust and related aversions. *J. Abnorm. Soc. Psychol.* 36 (3), 393.
- Bais, F., Schouten, B., Toepoel, V., 2020. Investigating response patterns across surveys: do respondents show consistency in undesirable answer behaviour over multiple surveys? *Bulletin of Sociological Methodology/Bulletin de Méthodologie Sociologique* 147–148 (1–2), 150–168.
- Brown, G.D.A., Fincher, C.L., Walasek, L., 2016. Personality, parasites, political attitudes, and cooperation: a model of how infection prevalence influences openness and social group formation. *Topics in Cognitive Science* 8 (1), 98–117.
- Crawshaw, P., 2012. Governing at a distance: social marketing and the (bio)politics of responsibility. *Soc. Sci. Med.* 74, 200–2007.
- Crosby, C.L., Durkee, P.K., Meston, C.M., Buss, D.M., 2020. Six dimensions of sexual disgust. *Pers. Individ. Differ.* 156, 1–13.

- Davis, C.M., Bauserman, R., 1993. Exposure to sexually explicit materials: an attitude change perspective. *Annu. Rev. Sex Res.* 4, 121–204.
- De Jong, P.J., Van Overveld, M., Borg, C., 2013. Giving in to arousal or staying stuck in disgust? Disgust-based mechanisms in sex and sexual dysfunction. *J. Sex. Res.* 50 (3–4), 247–262.
- Dillard, J.P., Shen, L., 2005. On the nature of reactance and its role in persuasive health communication. *Commun. Monogr.* 72 (2), 144–168.
- Donnerstein, E., Smith, S., 2001. Sex in the media: theory, influences, and solutions. In: Singer, D.G., Singer, J.L. (Eds.), *Handbook of Children and the Media*. Sage, Thousand Oaks, pp. 289–307.
- Döring, N., 2020. How is the COVID-19 pandemic affecting our sexualities? An overview of the current media narratives and research hypotheses. *Arch. Sex. Behav.* 49, 2765–2778.
- Faul, F., Erdfelder, E., Buchner, A., Lang, A.G., 2009. Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behav. Res. Methods* 41, 1149–1160.
- Fincher, C.L., Thornhill, R., 2012. Parasite-stress promotes in-group assertive sociality: the cases of strong family ties and heightened religiosity. *Behav. Brain Sci.* 35, 61–79.
- Fisher, J.D., Willcutts, D.L.K., Misovich, S.J., Weinstein, B., 1998. *AIDS Behav.* 2 (2), 101–113.
- Fleischman, D.S., Hamilton, L.D., Fessler, D.M., Meston, C.M., 2015. Disgust versus lust: exploring the interactions of disgust and fear with sexual arousal in women. *PLoS One* 10 (6), e0118151.
- Gagnon, M., Jacob, J.D., Holmes, D., 2010. Governing through (in)security: a critical analysis of a fear-based public health campaign. *Crit. Publ. Health* 20, 245–256.
- Geis, F.L., Brown, V., Jennings, J., Porter, N., 1984. TV commercials as achievement scripts for women. *Sex. Roles* 10, 513–524.
- Golde, J.A., Strassberg, D.S., Turner, C.M., Lowe, K., 2000. Attitudinal effects of degrading themes and sexual explicitness in video materials. *Sex. Abuse J. Res. Treat.* 12 (3), 223–232.
- Gray, K., Wegner, D.M., 2012. Feeling robots and human zombies: mind perception and the uncanny valley. *Cognition* 125, 125–130.
- Haidt, J., McCauley, C., Rozin, P., 1994. Individual differences in sensitivity to disgust: a scale sampling seven domains of disgust elicitors. *Pers. Individ. Differ.* 16 (5), 701–713.
- Hastings, G., Stead, M., Webb, J., 2004. Fear appeals in social marketing: strategic and ethical reasons for concern. *Psychol. Market.* 21, 961–986.
- Hayes, A.F., 2018. Partial, conditional, and moderated moderated mediation: quantification, inference, and interpretation. *Commun. Monogr.* 85 (1), 4–40.
- Hicks, L.L., Meltzer, A., French, J.E., Altgelt, E.E., Turner, J.A., McNulty, J.K., 2021. Perceptions of infectability to disease moderate the association between daily concerns about contracting COVID-19 and satisfaction with sex. *Arch. Sex. Behav.*
- Huesmann, L.R., 1998. The role of social information processing and cognitive schema in the acquisition and maintenance of habitual aggressive behavior (pp. 73–109). In: Geen, R.G., Donnerstein, E. (Eds.), *Human Aggression: Theories, Research, and Implications for Policy*. Academic Press, New York.
- Jansma, L.L., Linz, D.G., Mulac, A., Imrich, D.J., 1997. Men's interactions with women after viewing sexually explicit films: does degradation make a difference? *Commun. Monogr.* 64, 1–24.
- Kemp, D., 2018. *The Persuasive Appeal of Disgust: Examining The Effects of Gruesome Images and Repulsive Feelings in Health and Prosocial Communication* [Doctoral Dissertation]. Cornell University.
- Krassas, N.R., Blauwkamp, J.M., Wesseling, P., 2003. 'Master your Johnson': sexual rhetoric in maxim and stuff magazines. *Sex. Cult.* 7, 98–119.
- Lee, E.M., Ambler, J.K., Sagarin, B.J., 2014. Effects of subjective sexual arousal on sexual, pathogen, and moral disgust sensitivity in women and men. *Arch. Sex. Behav.* 43 (6), 1115–1121.
- Lieberman, D., Patrick, C., 2018. *Objection: Disgust, Morality, and the Law*. Oxford University Press, Oxford.
- Linz, D., 1989. Exposure to sexually explicit materials and attitudes towards rape: a comparison of study results. *J. Sex. Res.* 26, 50–84.
- Linz, D., Donnerstein, E., Penrod, S., 1988. Effects of long-term exposure to violent and sexually degrading depictions of women. *J. Pers. Soc. Psychol.* 55, 758–768.
- Lupton, D., 2015. The pedagogy of disgust: the ethical, moral and political implications of using disgust in public health campaigns. *Crit. Publ. Health* 25 (1), 4–14.
- Machia, M., Lamb, S., 2009. Sexualized innocence: effects of magazine ads portraying adult women as sexy little girls. *J. Media Psychol.* 21, 15–24.
- MacKay, N.J., Covell, K., 1997. The impact of women in advertisements on attitudes toward women. *Sex. Roles* 36, 573–583.
- Malamuth, N.M., Ceniti, J., 1986. Repeated exposure to violent and nonviolent pornography: likelihood of raping ratings and laboratory aggression against women. *Aggress. Behav.* 12, 129–137.
- Malamuth, N.M., Impett, E.A., 2001. Research on sex in the media. What do we know about effects on children and adolescents? In: Singer, D.G., Singer, J.L. (Eds.), *Handbook of Children and the Media*. Sage, Thousand Oaks, pp. 269–287.
- Mausbach, B.T., Semple, S.J., Strathdee, S.A., Patterson, T.L., 2009. Predictors of safer sex intentions and protected sex among heterosexual HIV-negative methamphetamine users: an expanded model of the Theory of Planned Behavior. *AIDS Care* 21 (1), 17–24.
- Nabi, R.L., Moyer-Guse, E., Byrne, S., 2007. All joking aside: a serious investigation into the persuasive effect of funny social issue messages. *Commun. Monogr.* 74 (1), 29–54.
- Olatunji, B.O., Williams, N.L., Tolin, D.F., Abramowitz, J.S., Sawchuk, C.N., Lohr, J.M., Elwood, L.S., 2007. The Disgust Scale: item analysis, factor structure, and suggestions for refinement. *Psychol. Assess.* 19, 281–297.
- O'Shea, K.J., DeBruine, L.M., Jones, B.C., 2019. Further evidence for associations between short-term mating strategy and sexual disgust. *Pers. Individ. Differ.* 138, 333–335.
- Patrick, C., Cuthbert, B., Lang, P., 1994. Emotion in the criminal psychopath: fear image processing. *J. Abnorm. Psychol.* 103 (3), 523–534.
- Phelan, N., Edlund, J.E., 2016. How disgust affects romantic attraction: the influence of moods on judgments of attractiveness. *Evol. Psychol. Sci.* 2 (1), 16–23.
- Rozin, P., Fallon, A., Mandell, R., 1984. Family resemblance in attitudes to foods. *Dev. Psychol.* 20 (2), 309.
- Schaller, M., Duncan, L.A., 2007. The behavioral immune system: its evolution and social psychological implications. In: Forgas, J.P., Haselton, M.G., Von Hippel, W. (Eds.), *Evolution and the Social Mind: Evolutionary Psychology and Social Cognition*. Psychology Press, New York, pp. 293–307.
- Schaller, M., Duncan, L.A., 2016. The behavioral immune system. *The handbook of evolutionary psychology* 1, 206–224.
- Sevi, B., Aral, T., Eskenazi, T., 2018. Exploring the hook-up app: low sexual disgust and high sociosexuality predict motivation to use Tinder for casual sex. *Pers. Individ. Differ.* 133 (15), 17–20.
- Shen, L., 2010. Mitigating psychological reactance: the role of message-induced empathy in persuasion. *Hum. Commun. Res.* 36 (3), 397–422.
- Thornhill, R., Fincher, C.L., 2014. The parasite-stress theory of sociality, the behavioral immune system, and human social and cognitive uniqueness. *Evol. Behav. Sci.* 8 (4), 257–264.
- Tomkins, S., 1963. *Affect Imagery Consciousness: Volume II: the Negative Affects*. Springer Publishing Company, New York.
- Tybur, J.M., Gangestad, S.W., 2011. Mate preferences and infectious disease: theoretical considerations and evidence in humans. *Phil. Trans. Biol. Sci.* 366 (1583), 3375–3388.
- Tybur, J.M., Lieberman, D., Griskevicius, V., 2009. Microbes, mating, and morality: individual differences in three functional domains of disgust. *J. Pers. Soc. Psychol.* 97 (1), 103.
- Tybur, J.M., Lieberman, D., Kurzban, R., DeScioli, P., 2013. Disgust: evolved function and structure. *Psychol. Rev.* 120 (1), 65.
- Tybur, J.M., Inbar, Y., Güler, E., Molho, C., 2015. Is the relationship between pathogen avoidance and ideological conservatism explained by sexual strategies? *Evol. Hum. Behav.* 36 (6), 489–497.
- Van Overveld, M., De Jong, P.J., Peters, M.L., Van Lankveld, J., Melles, R., Ter Kuile, M. M., 2013. The sexual disgust questionnaire: a psychometric study and a first exploration in patients with sexual dysfunctions. *J. Sex. Med.* 10 (2), 396–407.
- Vant Riet, J., Ruiters, R.A.C., 2013. Defensive reactions to health-promoting information: an overview and implications for future research. *Health Psychol. Rev.* 7, S104–S136.
- Witte, K., 1992. Putting the fear back into fear appeals: the extended parallel process model. *Commun. Monogr.* 59, 329–349.
- Wright, P.J., 2011. Mass media effects on youth sexual behavior: assessing the claim for causality. *Commun. Yearbk.* 35, 343–386.
- Wright, P.J., Arroyo, A., Bae, S., 2015. An experimental analysis of young women's attitude toward the male gaze following exposure to centerfold images of varying explicitness. *Commun. Rep.* 28 (1), 1–11.
- Wright, P.J., Tokunaga, R.S., 2015. Activating the centerfold syndrome: recency of exposure, sexual explicitness, past exposure to objectifying media. *Commun. Res.* 42 (6), 864–897.
- Zhang, J., 2019. Sexual disgust sensitivity mediates the sex difference in support of censoring hate speech. *Pers. Individ. Differ.* 145 (15), 89–96.
- Zsok, F., Fleischman, D.S., Borg, C., Morrison, E., 2017. Disgust trumps lust: women's disgust and attraction towards men is unaffected by sexual arousal. *Evol. Psychol. Sci.* 3, 353–363.