

Disgust Among People who use Child Pornography

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Arts in Psychology

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Abstract

How can some people use child pornography, when most find it disgusting and aversive? The current study explored this question by looking at whether people who use child pornography are less sensitive to disgust than people who don't use child pornography. In addition, variables such as contact offending-related behaviour, fantasy, adult pornography use onset and frequency, childhood sexual abuse, hypersexuality, child pornography use onset and frequency, severity of content, cognitive distortions and age preference were examined in relation to disgust and the use of child pornography. A community sample of people who used child pornography were recruited online, and completed an anonymous survey. Comparison group participants who had never used child pornography but reported using adult pornography were recruited on Prolific. Results suggest that study group participants are less sensitive to sexual and pathogen disgust than comparison, but not moral disgust. The salience of attitudes supportive of child sexual abuse among study group participants may explain the lack of significant differences in moral disgust between groups, as cognitive distortions permit the user to appraise the use of child pornography as justified or acceptable. Early and frequent exposure to adult pornography may have also influenced perceptions of what is and isn't disgusting or morally wrong, and facilitated the use of child pornography. Findings increase understanding of non-forensic samples of child pornography users, and the role that disgust plays in harmful sexual behaviour against children. Due to the exploratory nature of the study, future research should seek to replicate findings.

Disgust Among People who use Child Pornography

Nearly everyone agrees that child pornography is disgusting, yet some people use it. Given that disgust generally makes things aversive to people, why are some individuals not averse to using child pornography? There are several theoretical possibilities. Perhaps people who use child pornography lack a disgust response to child pornography, or are less sensitive to sexual disgust. Maybe they are generally less sensitive to disgust, regardless of context. Alternatively, people who access child pornography may possess a normative disgust response, which is overridden by an even stronger desire to use child pornography. The current study will apply what is known about disgust in the psychological literature to understand how the use of child pornography might be related to an unusual disgust response.

Child Pornography

Child pornography may be defined as graphic, written, or audio material depicting or promoting the sexual exploitation of a child (Gillespie, 2009, as cited in Merdian et al., 2013). The term “child pornography” will be used throughout. Alternative terminology is commonly used within the literature (including Child Sexual Abuse Material or Child Exploitation Material) to highlight the exploitation and abuse inherent in the creation and use of material, and to avoid normalising an illegal behaviour. Use of the term “child pornography” by the current study is not intended to minimise harm, but rather to ensure literature on the topic can be easily located and understood by researchers and members of the public alike.

Based on the sheer expanse of child pornography distributed and accessed online, it is reasonable to deduce that most people who use child pornography are undetected (Beier et al., 2015). The National Centre for Missing and Exploited Children (NCMEC) is the clearinghouse for all child pornography detected by the public and online sharing platforms in the United States, receiving and processing more reports than any other clearinghouse

internationally. Utilising NCMEC meta-data, Bursztein and colleagues' (2019) longitudinal analysis revealed that of 23.4 million reports of online child pornography between 1998m – 2017, 9.6 million (40%) of reports occurred in 2017 alone. While the majority (70%) of child pornography reports ten years ago concerned content within North and South America, in 2017, 68% of reports reflect abuse in Asia, 19% in North and South America, 7% in Africa, and 6% in Europe, demonstrating that concerns about content are becoming increasingly more universal. Child pornography causes immeasurable harm to victims and to society. Child pornography involves the sexual victimisation and re-victimisation of children, which is associated with adverse psychopathological and psychosocial outcomes such as post-traumatic stress disorder, schizophrenia, and substance misuse (Hailes et al., 2019).

Disgust

To connect disgust and the use of child pornography, it is necessary to first explore what disgust is and how it influences behaviour. There is some uncertainty about what disgust is, how it is experienced, and how it operates. Perhaps this is unsurprising, given that emotions are the subject of conceptual disagreement by researchers (Ekman, 2016). For the purposes of the current study, emotion may be understood as a “state of conscious feeling, typically characterised by physiological changes...heavily saturated with cognition” (Baumeister et al., 2007, p. 168 - 169), and disgust is regarded as one of the most empirically established emotion labels alongside anger, fear, sadness and happiness (Ekman, 2016; Lange et al., 2020). Emotions can be conceptualised as a response to recurring selection pressures, and disgust as an alarm for potential threats to survival (Tybur et al., 2009).

It is largely accepted that disgust and behaviour are entangled and mutually informative, although the exact processes are debated (Baumeister et al., 2007). Certainly, disgust motivates withdrawal behaviour, prompting avoidance of the eliciting stimulus (Ekman & Friesen, 1975; Haidt et al., 1994). Disgust encompasses three functional domains:

pathogen disgust, sexual disgust, and moral disgust (Tybur et al., 2009). Each domain arose to combat a unique evolutionary threat. Initially, disgust existed as a physiological response, guarding against exposure to infectious pathogens (Oaten et al., 2009). Sexual disgust emerged to motivate the avoidance of sexual mates and behaviour that threatened reproductive fitness and success (Tybur et al., 2013). At a certain point, disgust was co-opted to embody a moral conscience, although there are competing theories pertaining to how and why this occurred (Rozin et al., 2008; Tybur et al., 2013). Despite this debate, one widely accepted theory is that moral disgust serves to deter the violation of social norms and acts as a litmus test for morality.

Related to the domains outlined above, typical disgust-eliciting stimuli include bodily fluid and waste, decay, filth, certain animals (insects and rats), certain sexual acts and partners, and violations of social norms such as child abuse, animal abuse, forbidden sexual behaviour, and theft (Landy & Goodwin, 2015; Moran et al., 2021). Specific to moral disgust, there is a distinction between bodily and non-bodily violations. Bodily violations include sexual taboos such as pedophilia, whereas non-bodily violations include scenarios involving deception and betrayal (Russel & Giner-Sorolla, 2013). Bodily violations tend to evoke disgust responses independent from anger, whereas disgust at violation of non-bodily norms is intertwined with anger (Russell & Giner-Sorolla, 2013; Royzman et al., 2008). Some research has demonstrated greater intensity of disgust responses to sexual bodily norm violations than to nonsexual bodily norm violations (Shaich Borg et al., 2008). Clearly, disgust is a powerful, instinctually rooted emotion, capable of directing a person away from behaviour that might endanger their survival, safety, and reputation.

Child Pornography and Disgust

Why, then, do some people still engage in behaviour that most other people find disgusting and avoid, such as using child pornography? Understandably, even the concept of

child pornography is aversive to most people, and typically evokes a tangible disgust response. A recent study found that the public tend to view child pornography offending among the most severe crimes (Steel et al., 2022), and in another study examining police officers' perceptions of child pornography use (Powell et al., 2015), "disgusting" was a common descriptor. Similarly, people who use child pornography are often judged as objects of disgust (Jahnke & Hoyer, 2013; Jahnke et al., 2015; Spencer, & Ricciardelli, 2016).

Child pornography is considered disgusting for several reasons. Child pornography breaches trust, transgresses human rights, and involves the sexual abuse, victimisation, and re-victimisation of children, violating bodily and non-bodily norms (Powell et al., 2015). Evolutionarily, children are undesirable sexual mates as they are incapable of reproducing. Therefore, the sexualisation of children is likely to elicit sexual disgust (Tybur et al., 2013). Disgust also help to decide what sexual behaviours are morally acceptable, and what sexual behaviours are morally unacceptable. Typically, the idea of sexual behaviour involving children is met by visceral moral disgust, alongside sexual disgust (Giner-Sorolla, Bosson, Caswell & Hettinger, 2012).

Because sex with children is generally considered disgusting and morally wrong, most people will actively avoid engaging in behaviour that sexualises children. However, this doesn't appear to be the case for people who use child pornography. The relationship between sexual arousal and disgust might help explain why avoidance behaviour doesn't always follow disgust (Babchishin et al., 2019). Sexual arousal is a persuasive force that is intimately connected with disgust. It has been conceptualised as an "unexplored emotion", largely ignored by traditional emotion research (Al-Shawaf et al., 2015). The presence of sexual arousal may inhibit sexual disgust (Borg & de Jong, 2012; Fleischman, 2014), increasing willingness to engage in sexual behaviour typically considered socially undesirable or inappropriate (Ariely & Loewenstein, 2006; Babchishin et al., 2019; Elliott &

Babchishin, 2012). However, research has not robustly tested this link. Conversely, an excess of evidence suggests that the presence of moral and sexual disgust may diminish sexual arousal and suppress risky sexual behaviour (Crosby et al., 2020; Borg & de Jong, 2012; Fleischman et al., 2015; Lee et al., 2014).

It appears, therefore, that the presence of arousal can diminish disgust, just as the presence of disgust can diminish arousal. This bi-directionality highlights how any relationship between disgust and the use of child pornography is likely to be nonlinear and may be associated with several other variables. Research exploring the correlates of child pornography use may therefore provide relevant clues for understanding how disgust operates for people who use child pornography. Potentially relevant variables, including self-disgust, contact sexual offending, onset and frequency of exposure to pornography, severity of child pornography content, childhood sexual victimisation, hypersexuality, cognitive distortions, and fantasy, are discussed below.

Self-Disgust

Disgust can be internalised, and self-stigmatisation may occur among child pornography users, manifesting in guilt and shame (Graf & Dittman, 2011). Negative mental health and interpersonal outcomes are associated with stigma (Hatzenbuehler, 2009; Jahnke & Hoyer, 2013; Pescosolido, 2015), which may function as risk factors for the initiation of contact sexual offending or exacerbate child pornography use (Marshall & Marshall, 2010; Ward & Siegert, 2002). Dervley et al.'s (2017) qualitative analysis revealed that social shame related to child pornography use negatively impacted motivation to engage in treatment, and rendered suicide a viable alternative to coping with stigmatisation for some participants. Furthermore, dissatisfaction with the self was identified as a factor contributing to child pornography engagement in a qualitative study (Quayle & Taylor, 2003).

Understanding self-disgust among people who use child pornography may provide clues about how to interpret general disgust. For example, high self-disgust might indicate that an individual is distressed by their use of child pornography and believes that it is a disgusting behaviour, suggesting that engagement in use is a complicated narrative involving more than just diminished disgust response.

Contact Offending

Child pornography users are emerging as a distinct type of sexual offender (Elliott, 2016), and can be differentiated demographically, behaviourally and psychologically from individuals who engage in contact sexual offending against children. Findings from the National Juvenile Online Victimization Survey (Wolak et al., 2005) suggest that child pornography users are predominately Caucasian (91%), and older than age 25 (86%). Most child pornography users are male (Elliott, 2016), and although child pornography use among females does occur (Elliott et al, 2010; Martellozzo et al., 2010), most available literature focuses on males. Compared to individuals who engage in contact offending, child pornography users are less likely to belong to an ethnic minority (8.2% vs 35.4%), and have a higher income and level of education (Babchishin et al., 2011).

A proportion of child pornography users also engage in the contact sexual abuse of children. One meta-analysis suggested that approximately 12% of convicted child pornography offenders had an official record of contact sexual offending, increasing to 55% with the inclusion of self-reported offending data (Seto et al., 2011). Data utilising forensic populations suggests that these individuals have a greater risk of recidivism compared to exclusive child pornography offenders (Goller et al., 2016), are more likely to display paedophilic interest, and score higher on measures of cognitive distortions (Babchishin et al., 2015) than both child pornography exclusive offenders and child contact sexual offenders.

As such, it is possible that disgust sensitivity operates differently between exclusive child pornography users and people who use child pornography as well as engage in the contact sexual abuse of children, due to the different motivations and characteristics associated with child pornography use versus contact offending-related behaviour.

Onset and Frequency of Exposure to Pornography

Early exposure and frequent use of adult pornography may influence how disgust operates. Elliott (2016) discusses how exposure to pornography during childhood or adolescence may adversely affect sexual development, distorting internal working models of relationships and sex, and generating enduring sexual scripts that govern sexual engagement (Wright & Randall, 2012; Ó Ciardha & Gannon, 2011). Consistent with a developmental psychopathology perspective (Hinshaw, 2008), this may represent a developmental cascade that impacts propensity to engage in child pornography use and affects disgust. If disgust sensitivity is malleable, onset and frequency of exposure to pornography may alter the development of disgust through a process of desensitisation: the earlier and more frequently an individual is exposed to sexualised content, the more normal it becomes. This process is well-established in the pornography use literature, where people quickly become desensitised to pornography with use, and seek more extreme, violent and degrading forms of pornography (Binnie & Reavey, 2020; Bridges, 2010). Early and repeated exposure to pornography may therefore raise the threshold for what is disgusting and aversive to an individual, and increase their likelihood of using child pornography.

Severity of Material

This process of desensitisation appears to be at play when considering the use of child pornography. Child pornography users tend to seek out a range of varied material (Wolak et al., 2005), begin with material deemed to be in closer alignment with sexually normative views, and progress to more objectionable material (Quayle & Taylor, 2003). For example,

Seto et al. (2015) identified consumption of violent pornography as an independent predictor of child pornography use (adjusted $OR = 16.14$, $p < .001$). This suggests that use of extreme pornography strongly predicts the subsequent use of child pornography. Such a progression may be incremental. Interestingly, research suggests that disgust reactions should become more intense as child pornography content deviates from sexual norms (Burns et al., 2008; Giner-Sorolla et al., 2012; Piazza et al., 2013). However, it appears that repeated exposure to child pornography material conditions sexual arousal to child pornography (Wood, 2013). Perhaps one important mechanism related to this is the destabilisation of disgust.

Therefore, it seems that early and repeated exposure to pornography sets the scene for the use of child pornography, and repeated exposure to child pornography sets the scene for the use of increasingly more severe child pornography material. Disgust may be implicated in this process, decreasing as the relative extremity of pornography increase, facilitating the use of child pornography. Further dispensation to disgust could then occur, facilitating the use of more extreme child pornography.

Childhood Sexual Victimization

Another formative experience that may be responsible for modifying disgust is childhood sexual abuse. As identified by a meta-analysis of 27 studies (Babchishin et al., 2011), people who use child pornography report significantly greater frequency of childhood sexual and physical victimisation compared to the general population. This pathway remains murky, and it is unclear what mechanisms are responsible for the link between early victimisation and later offending. A small amount of research has explored the development of sexual disgust during childhood and adolescence. For children, disgust and avoidance are normal responses to sex-related stimuli. Disgust undergoes a small transformation during early adolescence, where appropriate sex-related stimuli elicit less disgust and trigger approach behaviour (Borg et al., 2019). This is thought to facilitate the development of a sexual identity and motivate an

individual to engage in sexual behaviour prudent to reproduction and survival. When sexual abuse occurs during childhood or adolescence, it may impact the opportunity to develop a healthy sexual identity and perception of sex (Walker et al., 2012; Jespersen et al., 2009). It is possible that the effects of childhood sexual abuse extend to disgust, disrupting the delicate equilibrium of what is and isn't disgusting, increasing the likelihood of child pornography use.

Hypersexuality

Like the influence of sexual arousal, hypersexuality and compulsive sexual behaviour appear to be facilitators of child pornography use (Seto & Ahmed, 2014). Hypersexuality can be understood as increased susceptibility to sexual excitation, decreased sexual inhibition, and sexual preoccupation (Seto & Ahmed, 2014). Seto et al. (2015) found that sexual preoccupation was more prevalent among individuals who reported child pornography use, compared to those who did not report child pornography use (36.9% vs 14.4%). As discussed earlier, frequent adult pornography use (defined as almost daily) significantly increased (adjusted $OR = 4.07$, $p < .001$) risk of child pornography use. This suggests that behaviours indicative of hypersexuality, such as frequent use of adult pornography, strengthen the likelihood of child pornography engagement. Therefore, it is possible that for individuals whose child pornography use relates to a wider issue of hypersexuality, disgust becomes a subsidiary mechanism for their engagement in child pornography use. Alternatively, lower disgust sensitivity might mean there are fewer internal barriers, increasing vulnerability to sexual preoccupation. Either way, it seems likely that hypersexuality and disgust interact to produce or inhibit behaviour. Therefore, the use of child pornography may be driven by hypersexuality, decreased disgust sensitivity, or a combination of both variables.

Cognitive Distortions

Another potential factor that may influence how disgust is manifested is the presence of cognitive distortions. Cognitive distortions are the manifestation of underlying beliefs and attitudes that facilitate offending (Ó Ciardha & Ward, 2013). Cognitive distortions are empirically validated, psychologically meaningful risk factors for sexual offending and recidivism (Mann et al., 2010). Cognitive distortions endorsed by child pornography offenders relate to failure to form meaningful intimate and interpersonal relationships with other people, perceiving children as sexual objects, beliefs diminishing the harm generated by child pornography (particularly in comparison to contact child sexual abuse) and the reinforcing nature of the internet (Bartels & Merdian, 2016). The presence of cognitive distortions may moderate the impact that disgust exerts upon engagement with child pornography. Because cognitive distortions allow an individual to justify harmful behaviour, it is possible that they also allow a person to justify disgusting behaviour, overriding their disgust response.

Fantasy

Sexual fantasy is closely related to cognitive distortions that could equally impact the expression of disgust. When a sexual fantasy violates cultural or societal norms, it is called deviant (Rossegger et al., 2021). Deviant sexual fantasies have been established as key risk factors for sexual offending (Seto, 2019; Mann et al., 2010). This is true for people who use child pornography as well as people who engage in contact sexual offending against children. Merdian et al. (2016) suggest that fantasy is more salient among people who use child pornography compared to contact offenders, although other research contradicts this idea given that a large proportion of contact offenders also use child pornography (Broome et al., 2018). Nonetheless, deviant sexual fantasy is a psychologically meaningful etiological risk factor for the use of child pornography, and may moderate the influence of disgust on use.

Current Study

The current study explores disgust sensitivity among people who use child pornography, and the intersection of disgust with morality and behaviour. Understanding the relationship between disgust and child pornography use may provide insight into how and why people engage in harmful or abusive behaviours that would typically be aversive to most people. Furthermore, the current study seeks to illuminate factors that maintain or exacerbate child pornography use. Combined with increasing sophistication and adaptability of distribution mediums on the internet, evolving means of abuse, frequent emergence of new content, and surging clinical referrals related to use (Burgess et al., 2011), child pornography is a global pandemic. Current systems are ill-equipped to detect, respond and cope with the explosion of child pornography content and use, reaching “breaking point” (Bursztein et al., 2019, pp. 2601). Approaching the problem of child pornography by understanding the people who engage with such material may alleviate pressure by offering an alternative pathway – informing the prevention of abuse instead of intervening after it has already occurred.

Primarily, the current study sought to understand disgust among people who use child pornography. This was achieved by exploring whether people who use child pornography are less sensitive to disgust than people who don't use child pornography. Disgust was broken down into sexual, pathogen and moral domains, and differences between groups may be generalised or specific to particular domains.

In addition, relevant theoretical variables that may influence the relationship between disgust and child pornography use were considered, including self-disgust, contact offending-related behaviour, fantasy, adult pornography use, childhood sexual abuse, hypersexuality, child pornography use onset and frequency, severity of content, cognitive distortions and age preference. These variables may interact with disgust, and help explain the potential relationships between disgust and the use of child pornography.

Hypotheses that guided this study were:

- 1) People who use child pornography will be less disgusted than people who don't use child pornography
- 2) Differences in disgust between groups might be domain specific (e.g., lower sexual disgust but normative pathogen and disgust) or domain general (e.g., lower sexual, pathogen and moral disgust)
- 3) Self-disgust, contact offending-related behaviour, fantasy, adult pornography use, childhood sexual abuse, hypersexuality, child pornography use onset and frequency, severity of content, cognitive distortions and age preference will interact with disgust and the use of child pornography

The current study sought to understand disgust among a community sample of child pornography users, rather than a convicted sample. Community samples are under-represented in forensic research, and data suggests that most people who use child pornography are undetected community members. Therefore, research utilising a community sample will fill a gap in the existing research.

Methods

Participants

Study Group

Study group participants were people in the community who self-reported using or having accessed child pornography, and were at least 18 years of age. Study group participants were recruited through online advertisement on various platforms including Boy Chat, Visions of Alice, MAP Support Club (Protasia Foundation) and relevant Reddit communities. A short description of the study was used for advertisement; see Appendix B. Other community or online organisations working with individuals who are sexually attracted

to children or adolescents were also contacted, but they declined to advertise the study to their community members as the survey included questions about unadjudicated illegal activity. Study group participants were also asked to share the study on relevant platforms known to them. Snowball sampling was necessary to allow the study to reach individuals enmeshed in the child pornography use community, while minimising direct risk to researchers and participants. Recruitment remained open for eight months.

Because the survey asked about illegal, undetected activity, anonymity was extremely important. The study was originally administered using Qualtrics, which is a secure online survey platform. IP addresses were not collected, ensuring that participants remained anonymous to the researchers and survey host. However, after receiving feedback from online community members who wanted to access the survey via Tor (an encrypted browser, protecting user identity) for another layer of security, the survey was administered using SoSci Survey, a Tor-compatible platform. Data collected from both platforms was included in analyses.

Comparison Group

Comparison group participants were people in the community who were at least 18 years of age who had never used or accessed child pornography, but who may have accessed or used adult pornography. People who reported that they had never accessed or used child pornography nor adult pornography were not included in the comparison group. Comparison group participants were matched to study group participants on country of residence (United States and European countries) to reduce potential for the confounding influence of culture. Comparison group participants were recruited through Prolific and the survey was administered using SoSci Survey. A short description of the study was used for advertisement; see Appendix B. Some participants who were recruited to be part of the

comparison group met criteria for inclusion in the study group and were therefore moved into the comparison group for analyses.

Demographics

Demographic questions were asked at the beginning of the survey (age, country, ethnicity, gender, sexual orientation, education, religiosity). Participants could select more than one answer for ethnicity. Religiosity was assessed using Crosby's (2019) approach of asking participants to rate how religious they are on a 7-point scale from not at all religious (1) to extremely religious (7).

Overall, 130 participants completed the study. The study group comprised 40 participants: 17 participants completed the survey via Qualtrics and 23 participants completed the survey via SoSci Survey. Several participants ($n = 14$) recruited from Prolific for the comparison group indicated that they had accessed or used child pornography, and therefore met criteria for inclusion in the study group.

The comparison group comprised 79 participants. All comparison group participants were recruited through Prolific and completed the survey via SoSci Survey. Demographics of study group and comparison group are shown in Table 1.

Table 1

Demographics (Gender, Country, Ethnicity, Sexual Orientation and Education) of Study Group and Comparison Group

	Study Group % <i>n</i> = 40	Comparison Group % <i>n</i> = 79
Gender		
Male	85.00	51.90
Female	12.50	46.84
Non-binary	2.50	1.30
Country		
Argentina	2.50	0
Asia	2.50	0
Belgium	0	1.27
Brazil	2.50	0
Canada	2.50	1.27

Chile	2.50	3.80
Czech Republic	0	1.27
Dominican Republic	2.50	0
France	0	1.27
Germany	10.00	0
Greece	2.50	3.80
Hungary	5.00	3.80
Ireland	0	1.27
Israel	0	1.27
Italy	2.50	13.92
Mexico	2.50	3.80
Netherlands	5.00	1.27
Poland	5.00	15.19
Portugal	5.00	18.99
South Africa	7.50	24.00
Spain	2.50	3.80
Switzerland	2.50	0
United Kingdom	7.50	0
United States of America	27.50	0
Not specified	2.50	0
Ethnicity		
European/Caucasian/White	65.0	62.03
Asian	10.0	0
African	10.0	25.32
Hispanic/Latino/Spanish origin	10.0	12.66
Indigenous American	2.50	0
African American	2.50	0
Pacific Islander	2.50	0
Other	5.00	1.27
Sexual Orientation		
Heterosexual/straight	55.0	83.6
Lesbian/gay/homosexual		1.3
Bisexual	17.5	10.1
Queer	2.5	
Asexual	2.5	1.3
Uncertain	5.0	2.5
Minor Attracted Person	17.5	0.0
Other	0	1.3
Education		
Some school (not completed)		1.3
School completed	22.50	26.6
Some university (not completed)	32.50	22.8
Undergraduate qualification	20.00	22.8
Post-graduate qualification	22.50	22.8
Post-secondary school qualification	2.50	3.8

Measures

Three Domain Disgust Scale

The Three Domain Disgust Scale (TDDS; Tybur et al., 2009) is a 21-item self-report measure designed to capture individual sensitivity to three functional domains of disgust: pathogen, sexual and moral. The TDDS aligns with an adaptationist perspective, which conceptualises disgust as a response to recurring selection pressures throughout evolutionary history. Pathogen disgust serves to prevent exposure to infectious microorganisms. Sexual disgust serves to motivate the avoidance of sexual mates and behaviours that threaten reproductive fitness and success. Moral disgust serves to deter the violation of social norms. Reliability of the TDDS is good (Olatunji et al., 2012). Using a large sample of university students, validity of the pathogen and sexual disgust domains has been established, however, evidence for validity of the moral disgust domain is limited (Olatunji et al., 2012).

Only items that captured pathogen disgust (7 items; for example, “*sitting next to someone who has red sores on their arm*”) and moral disgust (7 items; for example, “*stealing from a neighbour*”) were used in the current study, and the scale was adjusted to align with the response options for the sexual disgust measure used (Sexual Disgust Inventory; Crosby et al., 2020) so that participants used a 7-point scale (1 = *not at all disgusting*; 7 = *extremely disgusting*). Scores for each domain were averaged to produce composite domain scores ranging from 1 – 7, with higher scores indicating greater disgust sensitivity. Reliability analyses revealed acceptable internal consistency for moral ($\alpha = 0.786$) and pathogen ($\alpha = 0.766$) domains of the TDDS in the current study.

Self-Disgust Scale

The Self-Disgust Scale (SDS; Overton et al., 2008) is an 18-item self-report measure designed to capture the extent to which an individual experiences disgust about, or directed toward, the self. The SDS comprises 12 items pertaining to self-concept (“*I find myself*

repulsive”) and behaviour (“*I often do things I find repulsive*”), and 6 items intended to balance scale negativity (“*I enjoy being outdoors*”). Excellent internal consistency of the scale has been demonstrated ($\alpha = .91$; Overton et al., 2008; $\alpha = .90$; Ypsilanti et al., 2019). Convergent validity is supported (Overton et al., 2008). Construct validity was also supported through factor analyses (Overton et al., 2008).

Participants responded to statements using a 7-point Likert scale (*1 = strongly agree, 7 = strongly disagree*). Scores were averaged to produce an overall score between 1 – 7. Higher scores indicate greater self-disgust. The SDS demonstrated reasonable internal consistency ($\alpha = 0.791$) in the current study.

Sexual Disgust Inventory

The Sexual Disgust Inventory (SDI; Crosby et al., 2020) is a 31-item self-report measure designed to capture the multidimensional nature of sexual disgust. The SDI has a six-factor structure that encapsulates sexual behaviour considered taboo (comprised of *incest*; “*having sex with your sibling*”, and *unusual sex acts*; “*sex with animals*” sub-factors), or involving oral sex (“*a man performing oral sex on a woman*”), promiscuity (“*threesomes or sex involving three people*”), hygiene concerns (“*having sex with someone who has unpleasant body odour*”), BDSM (“*whipping someone during sex*”) and same-sex attraction (“*sex between two men*”). Confirmatory factor analysis supported construct validity for the six-factor structure, and strong convergent validity of each factor within the sexual domain of the TDDS has been established (Crosby et al., 2020).

Participants responded to statements describing sex acts and indicated how sexually disgusting they found each sex act using a 7-point scale (*1 = not at all sexually disgusting; 7 = extremely sexually disgusting*). Factor scores were produced by averaging each item relating to the relevant factor, with higher scores indicating greater sexual disgust (range 1 –

7). A sexual disgust composite score was also derived from the average of scores for each of the six factors, with higher scores indicating greater sexual disgust (range 1 – 7).

Reliability analyses showed strong internal consistency of each domain of the SDI: taboo ($\alpha = 0.897$); incest ($\alpha = 0.863$); unusual sex ($\alpha = 0.826$); oral sex ($\alpha = 0.830$); BDSM ($\alpha = 0.892$); hygiene ($\alpha = 0.836$); same-sex attraction ($\alpha = 0.877$); and promiscuity ($\alpha = 0.843$).

Sexual Behaviour Involving Minors Scale

The Sexual Behaviour Involving Minors Scale (SBIMS; Neutze et al., 2011) was designed to capture the frequency of specific sexual behaviours involving children or teenagers (people who are underage), utilising a 5-point scale ranging from never (1) to daily (5). The SBIMS asks about sexual behaviour within the past 6 months, however we adapted this to capture any sexual behaviour involving children or teenagers (people who are underage) as an adult. Three items were used to assess child contact sexual abuse, and four items were used to assess sexual preoccupation (masturbation to sexual fantasies involving minors), and one item pertained to access of child pornography. Adequate internal reliability and convergent validity for sexual preoccupation items (masturbation to sexual fantasies involving children) have been reported (Neutze et al., 2011; Beier et al., 2015).

Scores for each item related to sexual offending were averaged to produce a score. Scores for each item related to sexual fantasy were averaged to produce a score. Higher scores indicated greater frequency of sexual behaviour involving children, and greater prevalence of sexual fantasy involving children, respectively (range 1 – 5). An additional item (*“How frequently have you used visual depictions of children or teenagers engaged in sexual activities, such as pornography?”*) was used as a screening measure for study group participants, and was not included in the average score for contact offending-related behaviour or fantasy. Participants who answered the screening question with an answer other than “never” were included as study group participants. Participants who answered the

screening question with “never” were included as comparison group participants. Reliability analyses revealed good internal consistency of the SBIMS contact offending-related behaviour ($\alpha = 0.830$) and fantasy ($\alpha = 0.889$) domains.

COPINE Scale

The COPINE Scale is designed to measure the harmfulness of child pornography content (Taylor et al., 2001). Because the progression of material severity reflects a psychological process of increased sexualisation (Quayle & Taylor, 2003; Merdian et al., 2013), the COPINE Scale reflects an escalation of sexual perception and child pornography content. The COPINE Scale utilises 10 severity levels to categorise child pornography on a continuum from Indicative (non-erotic/sexualised images) to Sadistic/Bestiality (sexual images involving pain or animals). Each successive level confers increased victim harm.

Participants were presented with a plain language description of each content category (based on Merdian et al., 2013). Study group participants were instructed to select which level(s) of content they used, which level(s) they preferred, and which level(s) they used most frequently.

Child Sexual Abuse Scale

The Childhood Sexual Abuse Scale (CSAS; Aalsma et al., 2002) is a self-report instrument designed to measure the occurrence of sexual victimisation during childhood (defined as less than or equal to 12 years of age). The CSAS consists of 4 items describing experiences of sexual abuse. Internal reliability ($\alpha = 0.830$) and validity have been established (Aalsma et al., 2002).

Participants were instructed to respond *Yes/No* to the occurrence of experiences when they were 12 years old or younger. CSAS items were then repeated and participants responded *Yes/No* to statements asking about experiences *after* they were 12 years of age. Items in each age bracket (≤ 12 and after 12 years of age) were summed separately to

produce two composite scores ranging from 0 to 4, with higher scores indicating more experiences of sexual abuse.

Sexual Inhibition/Sexual Excitation Scales – Short Form

The Sexual Inhibition/Sexual Excitation Scales – Short Form (SIS/SES – SF; Carpenter et al., 2010) is based on a dual-control model of sexual behaviour, where sexual inhibition and sexual excitation interact to influence sexual approach or avoidance responses. The SIS/SES-SF used in the current study follows a three-factor structure and comprising 14 items. Reliability ($r = .61$) and validity have been established (Carpenter et al., 2010).

Sexual inhibition is divided into inhibition due to threat of performance failure (SI failure; *“I cannot get aroused unless I focus exclusively on sexual stimulation”*) and inhibition due to the threat of performance consequences (SI consequences; *“if I am having sex in a secluded, outdoor place and I think that someone is nearby, I am not likely to get very aroused”*). SI failure and SI consequences consist of four items each. The sexual excitation (SES; *“when I think of a very attractive person, I easily become sexually aroused”*) factor consists of 6 items that tap into intrapersonal and interpersonal elements of sexual arousal.

Scale order was reversed from the original SIS/SES-SF to ensure consistency in directionality of measures across the survey. As such, participants were instructed to rate each item on a 4-point scale ($1 = \text{strongly disagree}$; $4 = \text{strongly agree}$). Scores for SES, SIS failure and SIS consequences were derived by averaging relevant items to produce composite scores ranging from 1 – 4, with higher scores indicating greater sexual inhibition and sexual excitation, respectively.

Reliability analyses revealed that the sexual excitation domain of the SIS/SES-SF demonstrated good internal consistency ($\alpha = 0.704$). However, internal consistency of the sexual inhibition due to threat of performance failure ($\alpha = 0.543$) and sexual inhibition due to

threat of performance consequences domains was low ($\alpha = 0.552$). Removing items from these domains did not result in any significant improvements. Results from these scales should therefore be interpreted with caution.

Internet Behaviours and Attitudes

Specific items from the Internet Behaviours and Attitudes Questionnaire (IBAQ; O'Brien & Webster, 2007) were utilised. The IBAQ is a self-report measure designed to capture behaviours ("*I have attempted to access child pornography from more than one computer*") and attitudes ("*Looking at pictures of children on the Internet does not mean I have committed a sexual offence*") relating to the use of child pornography. Participants responded *Yes/No* to statements regarding behaviour, and responded to attitude questions using a 5-point scale (*1 = strongly disagree, 5 = strongly agree*). Excellent internal consistency has been established ($\alpha = 0.93$; O'Brien & Webster, 2007).

In total, 11 IBAQ Behaviour items and 6 IBAQ Attitude items were used. In addition to these items, further items were constructed and included in the study to address important conceptual considerations. One item ("*I have arranged to meet, or met with children who I talked to online*") was constructed and added to differentiate between participants with and without the intention to potentially move from online sexual offending to contact sexual offending. One item ("*It is okay for children and adults to have sex together*") was constructed to assess explicit attitudes about the acceptability of sexual contact between children and adults. Four items ("*I feel better after looking at child pornography*", "*I feel worse when looking at child pornography*", "*I feel guilty when looking at child pornography*" and "*I feel guilty after looking at child pornography*") were constructed to provide additional nuance.

Existing items were then reviewed in terms of alignment with Bartels and Merdian's (2016) child pornography use-specific Implicit Theories (ITs; Unhappy World, Children as

Sexual Objects, Nature of Harm, Self as Uncontrollable, and Self as Collector). Several ITs were not represented by existing items, and therefore quotes reflecting these ITs were extracted from qualitative studies with people who use child pornography, and used as additional items. Eight quotes were utilised as items. One item ("*Child pornography helps me shut out parts of my life I find difficult to deal with*") reflects 'Unhappy World'; one item ("*When I use child pornography, I don't think of the images as people*") reflects 'Children as Sexual Objects'; two items ("*I can control whether child pornography arouses me*" and "*Using child pornography is addicting*") reflect 'Self as Uncontrollable'; and two items ("*Collecting child pornography is like collecting art*" and "*There is a thrill in collecting child pornography*") reflect 'Self as Collector.' Despite being an underlying belief rather than a core IT, 'Reinforcing Nature of the Internet' was also considered, with two items reflecting this construct ("*The internet makes it easy to access child pornography*" and "*The internet is a doorway to the dark side*"). The IT 'Nature of Harm' was already adequately represented by IBAQ items, so additional quotes were not necessary.

Attitude scores were averaged across the 15 items to produce a score ranging from 1 – 5, with higher scores indicating greater endorsement of attitudes that facilitate engagement with child pornography. Behaviour items (16 items) were used individually for descriptive purposes.

A reliability analysis was conducted to determine whether the IBAQ Attitude measure was reliable, considering the addition of items. The measure, consisting of 15 items, was found to be reliable ($\alpha = 0.763$). Excluding any items did not result in justifiable improvements in reliability.

Procedure

Participants provided informed consent before beginning the survey and were advised that the survey may take up to 30 minutes to complete. Given the sensitive nature of the survey, information regarding anonymity was provided; see Appendix B.

Demographic questions were asked at the beginning of the survey. Participants were then directed to complete the Three Domain Disgust Scale. An attention check was imbedded in the Three Domain Disgust Scale. Participants were asked to list things they find disgusting (“What things do you find most disgusting? Please list anything that comes to mind”). Due to sample size constraints, a decision was made not to exclude participants if they did not complete the attention check. Participants then completed the Self-Disgust Scale, Sexual Disgust Inventory and the Sexual Behaviour Involving Minors Scale. Based on the screening question, participants who indicated that they had used child pornography were included as study group participants and they survey branched off from comparison group participants.

Study group participants were then asked to complete the Childhood Sexual Abuse Scale, Sexual Inhibition/Excitation Scales, Internet Behaviours and Attitudes Questionnaire and the COPINE Scale, followed by supplementary questions; refer to Appendix C.

Following the screening question, comparison group participants were asked whether they had ever accessed or used child pornography. Those who selected “no” were directed to complete the Childhood Sexual Abuse Scale and the Sexual Inhibition/Excitation Scales, followed by supplementary questions; see Appendix C. Those who selected “yes” were directed to complete questions regarding onset and frequency of use (see Appendix C), the Childhood Sexual Abuse Scale, Sexual Inhibition/Excitation Scales followed by further supplementary questions; Appendix C.

All participants recruited to be a part of the study group (regardless of whether they ended up qualifying for the study or comparison group) were offered the chance to enter their

bitcoin details as an acknowledgement of their time taken to complete the survey.

Participants recruited through Prolific were paid £1.29 for participation (based on Prolific's recommended rate of £5 per hour), regardless of whether they qualified for the study or comparison group.

Planned Data Analyses

Firstly, demographic data were compared between the study and comparison groups using chi-squared tests of association; country of residence and ethnicity were not compared statistically as samples were matched on these variables.

Following this, independent samples *t*-tests were conducted for key dependent variables (disgust, contact offending-related behaviour, fantasy, adult pornography use and onset, sexual abuse victimisation, and sexual inhibition/sexual excitation), to explore differences in disgust between study and comparison groups. Descriptive statistics and paired samples *t*-tests were then utilised to explore within-group variation for study group-specific variables (child pornography use and onset, treatment, severity of material, cognitive distortions and age preference).

A correlation matrix was then produced to determine the relationship between key variables within the study group (disgust, contact offending-related behaviour, adult pornography use and onset, child pornography use and onset, child sexual victimisation, sexual inhibition/excitation, cognitive distortions and fantasy), including the relationship between these factors and gender. Lastly, thoughts about the use of child pornography was compared between study and comparison groups using independent samples *t*-tests. Descriptive statistics and paired-samples *t*-tests were also utilised to explore thoughts about the use of child pornography within the study group.

An alpha level of .05 was used for all analyses. Participants with incomplete datasets

were still included in relevant analyses. Because of the exploratory nature of the research and characteristics of the study sample, outliers were also not excluded from analyses. All data analytic choices were preregistered (<https://doi.org/10.17605/OSF.IO/CUN35>). IBM's Statistical Package for Social Sciences (SPSS) 28.0.1 and Jamovi 2.2.5 were used to analyse all data.

Results

Demographic Differences

All participants were aged 18 or older. An independent samples *t*-test showed no significant differences in age between study group participants ($n = 28$, $M = 31.20$, $SD = 11.80$) and comparison group participants ($n = 64$, $M = 27.10$, $SD = 7.29$), $t(36.2) = 1.71$, $p = .095$). A chi-square test of association revealed that the difference in gender distribution between groups was significant, $X^2(2, N = 119) = 13.70$, $p = .001$, reflecting the large number of female participants in the comparison group compared to the study group. Similarly, the distribution of sexual orientation between groups was significantly different, $X^2(6, N = 119) = 17.70$, $p = .007$, reflecting the increased proportion of individuals identifying as heterosexual in the comparison group compared to the study group, as well as the increased proportion of individuals in the study group identifying as Minor Attracted Persons. A Mann-Whitney U test was used to compare education between groups and no significant difference was found. An independent samples *t*-tests was conducted to compare religiosity between groups and no significant difference was found.

Disgust

Moral and Pathogen Disgust

There were no significant differences between the study ($M = 4.52$, $SD = 1.21$) and comparison ($M = 4.82$, $SD = 1.05$) groups for moral disgust composite scores ($t(117) = -1.42$, $p = .159$). Study group scores for pathogen disgust ($M = 4.11$, $SD = 1.27$) were significantly

lower than comparison group scores ($M = 4.63$, $SD = 0.98$), $t(63.09) = -2.29$, $p = .025$), $d = 0.48$, 95% CI [0.87, 0.10]. This difference was moderate.

Sexual Disgust

There were no significant differences between the study ($M = 3.63$, $SD = 1.04$) and comparison ($M = 3.74$, $SD = 0.87$) groups' composite sexual disgust scores, $t(117) = -0.61$, $p = .545$, however there were significant between groups on certain sexual disgust factors. As shown in Table 2, study group participants scored significantly lower on the taboo, hygiene, and promiscuity domains of sexual disgust than comparison group participants. The difference between groups for taboo and hygiene domains was large, and the difference for the promiscuity domain was medium (see Table 2). There were no significant differences between groups on same-sex attraction, oral sex and BDSM related sexual disgust.

Study group participants appeared to score significantly lower than comparison on specific items from the Sexual Disgust Inventory (Crosby et al., 2020) relevant to the use of child pornography, sexualisation of children and consent. Study group participants ($M = 3.45$, $SD = 2.50$) were significantly less likely to rate having sex with someone who is underage as disgusting than comparison ($M = 6.11$, $SD = 1.54$), $t(54.50) = -6.17$, $p < .001$, $d = 1.39$, 95% CI [1.91, 0.97]. This difference between groups was large. Study group participants ($M = 6.08$, $SD = 1.67$) also tended to view rape as significantly less disgusting than comparison ($M = 6.85$, $SD = 0.79$), $t(48.16) = -2.77$, $p = .004$, $d = 0.66$, 95% CI [1.1, 0.27], although both groups still rated rape as reasonably disgusting when looking at mean values. This difference between groups was moderate. Study group participants ($M = 5.05$, $SD = 2.31$) also rated having sex with their own children (i.e. incest) as less disgusting than comparison ($M = 6.89$, $SD = 0.75$), $t(43.23) = -4.90$, $p < .001$, $d = 1.25$, 95% CI [1.66, 0.84]. This difference between groups was large. Study group participants ($M = 1.73$, $SD = 1.41$) were also significantly less likely than comparison ($M = 2.45$, $SD = 1.59$) to rate watching pornography as disgusting,

$t(87.49) = -2.520, p = .014, d = 0.47, 95\% \text{ CI } [0.86, 0.09]$. This difference between groups was moderate. Similarly, study group participants ($M = 3.89, SD = 2.51$) rated child pornography as significantly less disgusting than comparison ($M = 6.91, SD = 0.68$), $t(41.941) = -7.502, p < .001, d = 1.95, 95\% \text{ CI } [2.39, 1.49]$. This difference between groups was large.

Self-disgust

There were no significant differences in self-disgust between the study group ($M = 5.14, SD = 1.17$) and comparison group ($M = 5.32, SD = 0.94$), $t(117) = -0.91, p = .360$.

Table 2*Sexual Disgust Domain Scores for Study and Comparison Groups*

Domain	Study group (<i>n</i> = 40)	Comparison group (<i>n</i> = 79)	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>	95% Confidence Interval	
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)					Upper	Lower
Taboo	5.07 (1.44)	6.65 (0.65)	-6.60	47.11	<.001	-1.60	2.03	1.17
Incest	4.79 (2.07)	6.71 (0.81)	-5.64	45.12	<.001	-1.40	1.82	0.98
Unusual Sex Acts	5.19 (1.32)	6.10 (0.70)	-4.08	50.45	<.001	-0.96	1.35	0.55
Oral Sex	2.03 (1.41)	1.80 (1.12)	0.958	117	0.34	0.19	0.20	0.57
BDSM	3.27 (1.64)	3.31 (1.59)	-0.15	117	0.883	-0.30	0.42	0.35
Hygiene	4.55 (1.69)	5.32 (1.30)	-2.54	62.89	0.014	-.54	0.92	0.15
Same-sex Attraction	2.10 (1.58)	2.48 (1.66)	-1.20	117	0.233	-.23	0.61	0.15
Promiscuity	2.16 (1.55)	2.89 (1.52)	-2.48	117	0.114	-.48	0.87	0.10

Gender was significantly correlated with pathogen disgust ($r = .26, p < .01$), hygiene ($r = .43, p < .001$), and taboo ($r = .38, p < .001$) domains of sexual disgust. This shows that female participants were moderately more sensitive to pathogen and certain factors of sexual disgust, than male participants. Gender did not significantly correlate with moral disgust, or same-sex, promiscuity, BDSM or oral-sex related sexual disgust.

Contact Offending Related Behaviour

Looking at responses other than “never” to individual offending-related items of the Sexual Behaviour Involving Minors Scale (Neutze et al., 2011), 20.51% ($n = 8$) of the study group ($n = 39$) report having had sexual contact with a child or teenager compared to 3.8% ($n = 3$) of comparison group participants ($n = 79$). An independent t -test showed that this difference between study ($M = 1.26, SD = 0.59$) and comparison ($M = 1.06, SD = 0.37$) was not significant, $t(52.98) = 1.858, p = .069$. A significantly higher proportion of study group participants (15%, $n = 6; M = 1.23, SD = 0.62$) report having engaged in sexual activities such as indecent exposure or masturbating in the presence of a child or teenager than comparison (0%), $t(39) = 2.30, p = .027$. 22.50% ($n = 9; M = 1.33, SD = 0.73$) of the study group ($n = 40$) report having engaged in sexual interactions with a child or teenager (sexual conversations, showing children or teenagers pornography or recording pornographic content involving children or teenagers) compared to 0% of comparison group participants. This difference is significant, $t(39) = 2.82, p = .008$.

Comparison of composite scores for offending behaviour involving children showed that study group participants ($M = 1.26, SD = 0.59$) were significantly more likely than comparison ($M = 1.02, SD = 0.12$) to have engaged in sexual behaviour involving children, $t(40.76) = 2.63, p = .012$.

Fantasy

When looking at responses other than “never” to individual items of the Sexual Behaviour Involving Minors Scale (Neutze et al., 2011) related to fantasy, significantly more study group participants (76.92%, $n = 30$) report fantasising (during masturbation) about sexual contact with a child or teenager than comparison (3.80%, $n = 3$). This difference between study ($M = 3.23$, $SD = 1.55$) and comparison ($M = 1.05$, $SD = 0.27$) is significant, $t(39.16) = 8.81$, $p < .001$. 67.50% ($n = 27$) of the study group report having fantasies about engaging in sexual activities such as indecent exposure or masturbation in the presence of a child or teenager, compared to 1.27% ($n = 1$) of comparison group participants. This difference between study ($M = 2.45$, $SD = 1.40$) and comparison ($M = 1.01$, $SD = 0.11$) is significant; $t(39.26) = 6.51$, $p < .001$. 57.50% ($n = 23$) of study group participants report fantasising about engaging in sexual interactions with a child or teenager (sexual conversations, showing children or teenagers pornography) compared to 1.27% ($n = 1$) of comparison. This difference between study ($M = 2.30$, $SD = 1.50$) and comparison ($M = 1.01$, $SD = 0.11$) is significant, $t(39.24) = 5.59$, $p < .001$. 48.72% of ($n = 19$) of study group participants report fantasising about engaging in non-sexual physical contact with a child or teenager compared 3.84% ($n = 3$) of comparison group. This difference between study ($M = 2.15$, $SD = 1.37$) and comparison ($M = 1.05$, $SD = 0.27$) is also significant, $t(39.54) = 4.99$, $p < .001$.

Comparison of composite scores for sexual fantasies involving children between study and comparison groups revealed that overall, study group participants ($M = 1.27$, $SD = 0.59$) were significantly more likely to fantasise about sexual contact with children, $t(39.66) = 8.18$, $p < .001$ than comparison ($M = 1.03$, $SD = 0.15$).

Gender was significantly negatively correlated with fantasy, suggesting that male participants were more likely to engage in fantasy ($r = -.30$, $p < .001$) than females.

Childhood Sexual Victimization

17.5% of study group participants reported experiencing sexual abuse before the age of 12, compared with 16.4% of comparison group participants. Rates of adult victimisation were also relatively high, with 25% of the study group reporting experiences of sexual abuse after the age of 12, compared with 26.6% of the comparison group.

Independent samples t-tests showed no significant differences between study ($M = 4.00$, $SD = 0.93$) and comparison ($M = 0.37$, $SD = 0.92$) groups' mean scores of sexual abuse before/at the age of 12 ($t(117) = 0.183$, $p = .855$), $d = .036$, 95% CI [.35, .41]. Similarly, there were no significant differences between study ($M = 0.48$, $SD = 1.01$) and comparison ($M = 0.48$, $SD = 1.05$) groups' mean scores for sexual abuse after the age of 12 ($t(117) = -0.408$, $p = .684$), $d = -.08$, 95% CI [.46, .30]. An equivalence test using a raw difference of 0.5 scale points to define the equivalence bounds $\Delta_L = -0.50$ and $\Delta_U = 0.50$ (Lakens et al., 2018) found that experiences of sexual abuse before/at the age of 12 ($t(78.00) = -2.60$, $p = .006$) and after the age of 12 ($t(80.8) = 2.10$, $p = .019$) were approximately equivalent between groups.

Gender was significantly positively correlated with child sexual abuse before the age of 12 ($r = 0.46$, $p > .001$) and after the age of 12 ($r = 0.19$, $p > .05$), indicating that female participants experienced more victimisation at both time points.

Hypersexuality

Although study group participants ($M = 2.59$, $SD = 0.57$) scored slightly higher on sexual excitation than comparison ($M = 2.39$, $SD = 0.61$), and lower on sexual inhibition domains (SI failure, $M = 2.27$, $SD = 0.74$; SI consequences, $M = 2.94$, $SD = 0.86$) than comparison (SI failure, $M = 2.29$, $SD = 0.62$; SI consequences, $M = 2.98$, $SD = 0.67$), there were no significant differences between groups for sexual excitation (SES), sexual inhibition due to threat of performance failure (SI failure), nor sexual inhibition due to threat of performance consequences (SI consequences). Equivalence tests using a raw difference of 0.5

scale points to define the equivalence bounds $\Delta_L = -0.50$ and $\Delta_U = 0.50$ (Larkens et al., 2018) suggested that groups displayed comparable levels of sexual approach and avoidance behaviour on the SES, $t(83.40) = -2.68, p = .004$; SI failure, $t(67.30) = 3.55, p = <.001$; and SIS consequences, $t(64.00) = 2.98, p = .002$.

Gender was significantly correlated with sexual excitation ($r = -.28, p < .01$) and sexual inhibition due to threat of performance failure ($r = .20, p < .05$), suggesting that female participants were less prone to sexual excitation and more prone to sexual inhibition than males.

Onset and Frequency of Exposure to Adult Pornography

Onset of Access

Study group participants ($n = 38$) reported first accessing adult pornography at a significantly younger age than comparison participants ($n = 79$). The average age for first accessing adult pornography (intentionally or unintentionally) for study group participants was 12.30 years ($SD = 4.20$) compared to 14.10 years ($SD = 3.79$) for comparison group participants, $t(115) = -2.22, p = .028$. The average age for first intentionally accessing adult pornography was 13.70 years ($SD = 4.81$) for study group participants ($n = 36$) and 16.10 years ($SD = 5.93$) for comparison ($n = 79$). This difference was not significant, $t(113) = -1.79, p = .077$.

Time Since Last Accessed

67.57% ($n = 25$) of study group participants reported last accessing adult pornography in the past 7 days compared to 53.85% ($n = 42$) of comparison group participants. 16.22% ($n = 6$) of the study group reported last accessing adult pornography within the last 4 weeks compared to 11.54% ($n = 9$) of comparison. No one from the study group reported last accessing adult pornography within the last 6 months, whereas 14.10% ($n = 11$) of the comparison group did. 2.70% ($n = 1$) of the study group reported last accessing adult

pornography in the last year compared to 7.69% ($n = 6$) of comparison, and 13.51% ($n = 5$) of study group reported accessing adult pornography more than a year ago, compared to 12.82% ($n = 10$) of comparison group participants. There were no significant differences between study ($M = 1.78$, $SD = 1.42$) and comparison groups ($M = 2.14$, $SD = 1.47$) for when pornography was last accessed.

Frequency

21.05% ($n = 8$) of participants from the study group reported accessing adult pornography daily, compared to 6.41% ($n = 5$) of comparison group participants. 36.84% ($n = 14$) of the study group reported accessing adult pornography weekly compared to 35.90% ($n = 28$) of comparison. 15.79% ($n = 6$) of study group participants reported accessing adult pornography monthly, compared to 16.67% ($n = 10$) of comparison, and 26.32% ($n = 10$) of study group participants reported seldom accessing adult pornography compared to 41.03% ($n = 32$) of comparison group participants. Study group ($M = 2.53$, $SD = 1.11$) participants accessed pornography significantly more frequently than comparison ($M = 2.08$, $SD = 1.02$), $t(114) = 2.17$, $p = 0.032$.

Gender

Gender was significantly correlated with the age of first intentionally or unintentionally accessing adult pornography ($r = .25$, $p > .01$), last access to adult pornography ($r = .33$, $p > .001$), and frequent use of adult pornography ($r = -.42$, $p > .001$). These results suggested that male participants first accessed adult pornography at a younger age, have used adult pornography more recently, and use adult pornography more frequently than females.

Child Pornography Use

Onset and Frequency

The average age for first intentionally accessing child pornography within the study group ($n = 27$) was 21.48 years. 44.45% ($n = 12$) reported accessing child pornography before the age of 18. 41.38% of study group participants ($n = 29$) reported accessing child pornography within the last 7 days, 13.79% reported accessing it in the last 4 weeks, 10.34% in the last 6 months, 3.45% in the last year, and 31.03% more than a year ago.

Treatment

Only 9.68% ($n = 3$) of the study group ($n = 31$) reported seeking treatment related to their use of child pornography. One person said they sought treatment from a sex therapist, one person reported seeking therapy, and one person reported seeking online help.

Severity of Material

Table 3 outlines the proportion of study group participants who indicated preference for, or reported using, each category of child pornography. Participants could select multiple categories. Out of ten categories of child pornography content, Table 4 outlines the number of categories participants reported preference for, reported using, and reporting using most frequently.

Table 3

Severity of Child Pornography Content by Preference, Use, and Most Frequent Use

		Preference (%) ($n = 28$)	Use (%) ($n = 29$)	Most Frequently Used (%) ($n = 26$)
1	Dressed children/teenagers in daily-life situations (for example, children playing, school pictures)	67.86	37.93	38.46

2	Children/teenagers in daily-life situations where it is normal to be naked, or in underwear or swimwear (for example, on the beach or in a bathtub)	71.43	37.93	34.62
3	Children/teenagers in daily-life situations where it is normal to be naked, or in underwear (for example, on the beach or in a bathtub). These images were created without the children/teenagers knowing it	42.86	17.24	15.38
4	Children/teenagers who know that they are being photographed/filmed and are posing or acting in a 'sexy' way (for example, they might pretend to be a model, a filmstar, or a porn star)	60.71	51.72	42.31
5	Children/teenagers where the main attention is on a boy's penis and a girl's vagina and or/chest	46.43	31.03	19.23
6	Children/teenagers engaged in a sexual activity, either alone or with other children/teenagers. They might touch each other, masturbate, have oral	50.00	55.17	38.46

	sex, or sexual intercourse			
7	Children/teenagers touching adults or adults touching children/teenagers in a sexual way	39.29	41.38	26.92
8	Children/teenagers engaged in sexual activity with an adult. They might masturbate, have oral sex, or sexual intercourse	42.86	48.28	38.46
9	Children/teenagers experiencing pain. For example, the children/teenagers might be tied, bound, beaten, or whipped	7.14	6.90	3.85
10	Children/teenagers engaging in sexual activity with an animal. They might masturbate, have oral sex, or sexual intercourse over or with an animal	14.29	10.34	0

Table 4

Number of Child Pornography Content Categories Selected (Preference, Use, and Most Frequent Use)

		Preference <i>n</i>(%) (<i>n</i> = 28)	Use <i>n</i>(%) (<i>n</i> = 28)	Most Frequently Used <i>n</i>(%) (<i>n</i> = 26)
1	Dressed children/teenagers in daily-life situations (for example, children playing, school pictures)	4 (14.29)	3 (10.71)	6 (23.08)

2	Children/teenagers in daily-life situations where it is normal to be naked, or in underwear or swimwear (for example, on the beach or in a bathtub)	7 (25.00)	7 (25.00)	8 (30.77)
3	Children/teenagers in daily-life situations where it is normal to be naked, or in underwear (for example, on the beach or in a bathtub). These images were created without the children/teenagers knowing it	6 (21.43)	3 (10.71)	6 (23.08)
4	Children/teenagers who know that they are being photographed/filmed and are posing or acting in a 'sexy' way (for example, they might pretend to be a model, a filmstar, or a porn star)	2 (7.14)	4 (14.29)	3 (11.54)
5	Children/teenagers where the main attention is on a boy's penis and a girl's vagina and or/chest	4 (14.29)	1 (3.57)	3 (11.54)
6	Children/teenagers engaged in a sexual activity, either alone or with other children/teenagers. They might touch each other, masturbate, have oral	3 (10.71)	3 (10.71)	0.00

	sex, or sexual intercourse		
7	Children/teenagers touching adults or adults touching children/teenagers in a sexual way	1 (3.57)	0.00
8	Children/teenagers engaged in sexual activity with an adult. They might masturbate, have oral sex, or sexual intercourse	0.00	4 (14.29)
9	Children/teenagers experiencing pain. For example, the children/teenagers might be tied, bound, beaten, or whipped	1 (3.57)	3 (10.71)
10	Children/teenagers engaging in sexual activity with an animal. They might masturbate, have oral sex, or sexual intercourse over or with an animal	0.00	0.00

There was a tendency to prefer and use a variety of content among study group participants. On average, study group participants indicated preference for three categories of child pornography, reported using child pornography from three categories, and reported most frequently using two categories of child pornography.

Child Pornography-Related Behaviours

28.21% ($n = 11$) of the study group reported categorising or organising their collection of child pornography, 23.08% ($n = 9$) reported contacting others in order to share or discuss child pornography, 15.38% ($n = 6$) reported planning their internet searches for child pornography before going online, 12.82% ($n = 5$) reported trading child pornography

with others, 10.26% ($n = 4$) reported creating a new personality to support their child pornography activity, 5.13% ($n = 2$) report contacting children who were unknown to them, 10.26% ($n = 4$) reported requesting specific child pornography content, and 2.56% ($n = 1$) reported asking others to produce specific child pornography content. No one from the study group reported producing child pornography, arranging to meet with, or meeting with children who they talked to online.

Child Pornography-Related Feelings

On average, study group participants did not agree with statements about feeling better when looking at child pornography ($M = 2.00$, $SD = 1.42$), nor feeling better after looking at child pornography ($M = 2.00$, $SD = 1.28$). Participants tended to remain neutral when it came to statements regarding feeling worse when looking at child pornography ($M = 3$, $SD = 1.69$) or after looking at child pornography ($M = 3.00$, $SD = 1.64$), feeling guilty when looking at child pornography ($M = 3.00$, $SD = 1.62$), and after looking at child pornography ($M = 3.00$, $SD = 1.57$). Table 5 displays the percentage of study group participants who endorsed each statement.

Table 5

Percentage of Study Group Endorsing Child Pornography-Related Feelings ($n = 39$)

	Strongly Disagree (1)	Disagree (2)	Neither Disagree nor Agree (3)	Agree (4)	Strongly Agree (5)
I feel better when looking at child pornography	48.72	5.13	17.95	13.08	5.13
I feel better after looking at child pornography	51.28	15.38	12.82	17.95	2.56
I feel worse when	25.64	25.64	7.69	5.13	35.90

looking at child pornography					
I feel worse after looking at child pornography	25.64	20.51	10.26	10.26	33.33
I feel guilty when looking at child pornography	23.08	25.64	12.82	5.13	33.33
I feel guilty after looking at child pornography	17.95	20.51	12.82	12.82	35.90

Cognitive Distortions

Overall, participants from the study group ($n = 39$) appeared to endorse attitudes facilitating the use of child pornography ($M = 3$, $SD = 0.68$). No study group participants scored the maximum individual average (5) and only one participant scored the minimum individual average (1). 15.38% ($n = 6$) had an individual average score of 4, 45.59% ($n = 17$) scored a 3, and 38.46% ($n = 15$) scored a 2.

Gender was significantly correlated with cognitive distortions among the study group ($r = -.34$, $p < .05$), suggesting that female participants endorsed fewer cognitive distortions than male participants.

Age Preference

Most study group participants indicated attraction to children across a range of ages, and indicated use of child pornography involving children from a variety of age groups. Of the 27 participants from the study group who completed questions on age preference, 22.22% ($n = 6$) reported being attracted to babies and toddlers (aged around 0-5), 66.67% ($n = 18$)

reported being attracted to children before puberty (aged around 6-11), 77.78% ($n = 21$) reported being attracted to children during puberty (aged around 12-15), and 44.45% ($n = 12$) reported being attracted to children after puberty (aged around 16-17). 37.04% ($n = 10$) indicated being attracted to only one age group, 29.93% ($n = 7$) reported attraction to two different age groups, 29.93% ($n = 7$) reported attraction to three age groups, and 11.11% ($n = 3$) reported attraction to four age groups.

Of the 22 participants from the study group who completed questions about the age of children in the child pornography they use, 31.82% ($n = 7$) reported using child pornography of only one age group, 31.82% ($n = 7$) reported using child pornography of two different age groups, 27.27% ($n = 6$) report using child pornography of three age groups, and 9.09% ($n = 2$) report using child pornography of four different age groups. 22.72% ($n = 5$) reported using child pornography of babies and toddlers, 72.73% ($n = 16$) reported using child pornography of children before puberty, 72.73% ($n = 16$) report using child pornography of children during puberty, and 45.45% ($n = 10$) report using child pornography of children after puberty.

Paired-samples t-tests were conducted to compare reported age preference with the age groups depicted in child pornography reportedly used. There was a significant difference between reported preference for children after puberty ($M = 0.32$, $SD = 0.48$) and the use of child pornography involving this age group ($M = 1.31$, $SD = 0.47$), $t(31) = -31$, $p < .001$, suggesting that child pornography involving children aged around 16-17 years is consumed at a higher rate, comparative to reported attraction.

Correlations

A correlation matrix was produced to identify any significant relationships between disgust (TDDS, SDS, SDI), child sexual abuse victimisation, sexual behaviour involving children, fantasy involving sexual contact with children, sexual excitation/inhibition, internet and child pornography related attitudes, age of onset for adult pornography and child

pornography, recency of adult and child pornography use, and frequency of adult and child pornography use within the study group.

Disgust

Moral disgust was significantly positively correlated with contact sexual offending against children ($r = .40, p < .05$), indicating that contact sexual offending is associated with increased moral disgust sensitivity. Pathogen disgust was significantly positively correlated with hygiene related sexual disgust ($r = .33, p < .05$), suggesting that as pathogen disgust sensitivity increases, so does hygiene related sexual disgust. Pathogen disgust was significantly positively correlated with sexual inhibition due to threat of performance failure ($r = .37, p < .05$), indicating that sexual behaviour tends to be more inhibited when pathogen disgust sensitivity is higher. Self-disgust was significantly negatively correlated with promiscuity related sexual disgust ($r = -.39, p < .05$), suggesting that less self-disgust is associated with greater disgust about multiple sexual encounters. Self-disgust was also significantly negatively correlated with internet and child pornography related attitudes ($r = .46, p < .01$) indicating that less self-disgust was associated with greater endorsement of beliefs about the acceptability of child pornography. Self-disgust was significantly positively correlated with the age of first intentionally or unintentionally accessing adult pornography ($r = .36, p < .05$) and age of first intentionally accessing adult pornography ($r = .35, p < .05$) and negatively correlated with frequency of adult pornography use ($r = -.36, p < .05$), suggesting that earlier age of onset for adult pornography use is associated with less self-disgust, and more frequent use of adult pornography is associated with decreased self-disgust.

Sexual disgust domains were strongly correlated with a number of other variables. Taboo related sexual disgust was significantly negatively correlated with sexual excitation ($r = -.40, p < .05$) suggesting that sexual excitation diminishes as sexual disgust increases. Taboo ($r = -.56, p < .001$) and taboo sub-factors (incest, $r = -.56, p < .001$ and unusual sex, r

= -.49, $p < .001$) related sexual disgust were significantly negatively correlated with internet and child pornography related attitudes, suggesting that sexual disgust has an inverse relationship with attitudes enabling the use of child pornography. Similarly, taboo ($r = -.60, p > .001$), incest ($r = -.54, p < .001$) and unusual sex ($r = -.58, p < .001$) factors were strongly correlated with fantasy about sexual contact involving children. The sexual disgust measure composite score also significantly negatively correlated with fantasy ($r = -.47, p < .01$). This suggests that decreased sexual disgust is associated with increased fantasy.

Taboo ($r = .48, p < .01$), incest ($r = .44, p < .01$) and unusual sex ($r = .45, p < .01$) related sexual disgust were significantly positively correlated with age of first intentional use of adult pornography which indicates that younger age of onset is associated with lower sexual disgust. The sexual disgust composite score also significantly positively correlated with age of first intentional use ($r = .35, p < .05$). This supports the idea that younger exposure to adult pornography is associated with decreased sexual disgust. Taboo ($r = -.45, p < .01$), incest ($r = -.50, p < .01$) and unusual sex ($r = -.36, p < .05$) related sexual disgust were strongly negatively correlated with frequency of adult pornography use, suggesting that more frequent use of pornography is associated with decreased disgust. The sexual disgust composite score was also significantly negatively correlated with frequency ($r = -.36, p < .05$). Taboo and unusual sex related sexual disgust were significantly positively correlated with recent child pornography use ($r = .45, p < .05$ and $r = 0.49, p < .01$, respectively) indicating that more recent use of child pornography was associated with heightened sexual disgust. The oral sex ($r = .39, p < .05$), hygiene ($r = .54, p < .001$), same-sex attraction ($r = .41, p < .001$) and promiscuity ($r = .35, p < .05$) domains of sexual disgust were significantly positively correlated with sexual inhibition due to threat of performance failure suggesting that increased sexual disgust is associated with sexual inhibition or avoidance behaviour.

Furthermore, the sexual disgust composite score was also significantly positively correlated with sexual inhibition ($r = .47, p < .01$).

Contact Offending-Related Behaviour

Sexual inhibition due to threat of performance failure also appeared to be positively correlated with contact sexual offending-related behaviour ($r = .32, p < .05$), suggesting that greater sexual inhibition because of fears about not being able to perform was associated with more sexual offending behaviour.

Childhood Sexual Victimization

Child sexual abuse before/at age 12 was significantly positively correlated with contact sexual offending ($r = .32, p < .05$), suggesting that early childhood experiences of sexual abuse are associated with increased behaviour involving sexual contact with children during adulthood. Childhood sexual abuse after age 12 was significantly negatively correlated with internet and child pornography related attitudes ($r = -.51, p < .001$), suggesting that attitudes condoning and perpetuating the use of child pornography increase as experiences of sexual victimisation in childhood decrease. Childhood sexual abuse after age 12 was also significantly positively correlated with taboo ($r = .39, p < .05$), incest ($r = .35, p < .05$) and unusual sex ($r = .37, p < .05$) factors of sexual disgust. Early childhood experiences of sexual abuse were also strongly correlated with sexual abuse in early adolescence ($r = .64, p < .001$).

Cognitive Distortions

Attitudes pertaining to the acceptability of child pornography were significantly positively correlated with adult pornography use frequency ($r = .39, p < .05$) indicating that greater endorsement of these attitudes is associated with more frequent use of adult pornography. These attitudes were also significantly positively correlated with fantasy about sexual contact involving children ($r = .46, p < .01$), indicating that more pervasive cognitive

distortions about child pornography are associated with greater prevalence of fantasy about children. Earlier use of adult pornography ($r = -.50, p < .01$) and greater frequency of use ($r = .368, p < .05$). is also associated with increased fantasy

Thoughts about Child Pornography

When asked about their thoughts on the use of child pornography, 100% of comparison group participants ($n = 78$) indicated that they found people who use child pornography disgusting, with 94.87% rating people who use child pornography as “extremely disgusting”. Study group participants ($n = 27$) were significantly less likely than comparison to rate themselves as disgusting through the eyes of others because of their child pornography use, $t(26.713) = -2.355, p = 0.26$, although on average, they tended to agree that other people who do not use child pornography find their use of child pornography disgusting.

Participants did not strongly disagree nor strongly agree with statements about their use of child pornography being disgusting ($n = 28$) or other people’s use of child pornography being disgusting ($n = 29$), and there were no significant differences between perceptions of their own use ($n = 27$) versus perceptions of others use ($n = 30$). However, on average, study group participants rated their individual use of child pornography as slightly less harmful than the ‘average’ child pornography user ($n = 28$). Only one participant rated their use as much more harmful, and the majority rated their use as about the same (42.86%, $n = 12$) or much less harmful (42.86%, $n = 12$).

Discussion

The current study investigated whether people who use child pornography experience disgust differently compared to people who do not use child pornography. Additionally, the study sought to understand how child pornography use and disgust may relate to contact sexual offending, onset and frequency of exposure to pornography and child pornography,

sexual victimisation, hypersexuality, child pornography content, cognitive distortions and perceptions about child pornography use.

Overall, findings suggested that people who use child pornography are less sensitive to sexual and pathogen disgust. However, study and comparison group individuals displayed similar levels of sensitivity to moral disgust. Study group participants strongly endorsed cognitive distortions about use of child pornography and sexual abuse of children, began using adult pornography at a younger age and used adult pornography more frequently than comparison.

Disgust

Study group participants were significantly less disgusted than comparison by pathogen-related stimuli, as well as sexual contexts related to taboo sexual behaviour, hygiene concerns and promiscuity. Furthermore, increased sexual and pathogen disgust among study group participants was associated with increased sexual inhibition and diminished sexual excitation. This supports the idea that disgust impacts sexual decision-making by inhibiting sexual arousal and decreasing the potential for sexual excitation, resulting in avoidance behaviour.

Accordingly, low sexual and pathogen-related disgust may facilitate the use of child pornography among study group participants. However, both pathogen disgust and two factors of sexual disgust (taboo and hygiene) significantly correlated with gender, with female participants reporting greater disgust than male participants. Because the comparison group was comprised of significantly more females than the study group, some of the difference in disgust associated with child pornography use may be explained by a gender effect. Unfortunately, this was not able to be directly explored in the current study due to sample size.

There were no significant differences in moral disgust between groups, suggesting that differences in disgust are specific rather than general. Prior research on people who sexually offend against children shows that empathy for child victims of road accidents is similar between offenders and the general population, but offenders display deficits in empathy for unknown victims of child sexual abuse (Fernandez et al., 1999). Seemingly, disgust operates in a similar way, as people who use child pornography have comparable levels of disgust to people from the general population on some domains, but disgust sensitivity related to sex and child pornography is markedly reduced. Specialised differences in sexual and pathogen disgust in the absence of differences in moral disgust between groups can be supported by existing research examining the role of disgust domains in harm judgements. Using the same disgust measure as the current study (TDDS; Tybur et al., 2009), Laakasuo and colleagues (2017) found that moral disgust sensitivity did not predict moral judgements of harm, whereas pathogen and sexual disgust did. This suggests that moral disgust might be less responsible than sexual and pathogen disgust in the use of child pornography.

Another explanation is that moral disgust items weren't sensitive enough to assess moral disgust among people who use child pornography. Furthermore, one study found that the moral domain of the scale lacked validity (Olatunji et al., 2012), suggesting that results should be interpreted with care. Items did not include content about children in a sexual context, however study group participants were significantly less disgusted by specific items about the use of child pornography, sexualisation of children, and consent that were included in the sexual disgust measure (SDI; Crosby et al., 2020). Although sexual disgust is a discrete domain, items of this nature are arguably tarnished by moral wrongness and therefore responses might be driven by moral disgust rather than sexual disgust. Therefore, moral disgust unrelated to the abuse of children is relatively similar between groups, but when

disgust relates to the sexual abuse of children, study group participants are noticeably less affected by it than the general population.

Study group participants used and reported preference for a variety of child pornography content, with few participants reporting use and preference for more extreme content. Perhaps generalised differences in disgust would have emerged if participants used more extreme content. Initially, the use of less severe content may be associated with relatively normative levels of disgust. Following a process of desensitisation and conditioning, the use of more extreme content may be associated with increasingly less disgust (Wood, 2013). Two participants reported using more extreme child pornography content that involved pain and torture, however there were no obvious patterns in disgust sensitivity compared to the rest of the study sample.

Similarly, although study group participants reported attraction to children who were a range of ages, and reported using child pornography involving children from a range of age groups, fewer participants reported attraction to babies and toddlers compared to other age ranges. Most participants reported attraction to, and use of content depicting, children aged around 6 – 11 and children aged around 12 – 15, and nearly half of the study group reported attraction to children aged around 16-17, and used content involving children in this age group. Arguably, the sexualisation of children is considered more abhorrent the younger the victim, and therefore less sensitivity to disgust might be required to find content involving babies and toddlers tolerable. Perhaps differences in moral disgust, alongside differences in sexual and pathogen disgust, might have been more likely if the sample included a larger number of participants with a preference for younger children. Or, as discussed earlier, perhaps this finding is further support for the idea that moral disgust is less relevant than sexual and pathogen disgust in harmful behaviours such as the use of child pornography and contact offending against children.

Among study group participants, those who engaged in greater levels of contact offending-related behaviour against children appeared to be *more* sensitive to moral disgust—not less. This is surprising, as one might assume that greater moral disgust would prevent an individual from offending against children. However, the opposite pattern occurred. There are several possible explanations for this finding. One explanation is that moral disgust operates independently from sexual behaviour among people who use child pornography and engage in contact offending. In other words, people who use child pornography and engage in contact offending-related behaviour compartmentalise moral disgust and the sexual abuse of children, and don't apply the same moral judgements to sexual behaviour involving children as they do to other morally offensive behaviour. This might help to explain why disgust wasn't lower among people who engaged in contact offending-related behaviour, but why was disgust *higher* among these participants compared to participants who didn't engage in contact offending-related behaviour? This may relate to an above-average-effect that seems to be operating among child pornography users, who tended to rate their own use of child pornography as slightly less harmful than the 'average' child pornography user. This effect has been demonstrated among offenders in previous research, who tend to rate themselves as better-than-average on several prosocial traits, as well as rating their worst trait as equivalent to the average offender or community member (Sedikides et al., 2014; Taylor et al., 2020). In the current study, this effect may be associated with the strength of cognitive distortions operating among participants and reinforce the compartmentalisation of disgust from engagement in harmful behaviour.

Regardless of the mechanism, this finding suggests that disgust operates differently between people who exclusively use child pornography, and people who also engage in contact offending-related behaviour, or that moral disgust is less involved in harmful behaviour involving children than might be assumed.

Cognitive Distortions and Fantasising

Cognitive distortions may change the way disgust influences behaviour by providing high-level justifications for harmful behaviour that override the presence of disgust. Study group participants strongly endorsed cognitive distortions about child pornography, suggesting that they hold enduring attitudes and beliefs about the acceptability of child pornography and sexualisation of children. Cognitive distortions were also associated with increased deviant sexual fantasy, which is a relationship supported by existing research demonstrating how cognitive distortions moderate the link between fantasy and behaviour (Rossegger et al., 2021).

Study group participants were also more likely than comparison to report having fantasised about engaging in sexual activities in the presence of children, sexual interactions with children, and sexual contact with children. Although in the current study, fantasising was not significantly correlated with contact offending-related behaviour, other research suggests that accessing child pornography reinforces deviant sexual fantasies, is used to grant permission or provide justification for acting on those fantasies, and may be used to rehearse contact abuse (Quayle & Taylor, 2002; Fortune et al., 2015).

Increased taboo-related sexual disgust was associated with lower levels of cognitive distortions and less sexual fantasising about children, suggesting that the presence of cognitive distortions decreases sensitivity to disgust, and that disgust may act as a suppressant for deviant sexual fantasising. Because cognitive distortions and fantasies are pervasive sexual scripts that have been developed and reinforced over time, the lower sexual disgust associated with cognitive distortions might indicate that the perception of what is disgusting has been altered in people who hold cognitive distortions and deviant sexual fantasy.

Low self-disgust was associated with greater endorsement of cognitive distortions about child pornography, which supports the idea that cognitive distortions provide justifications for the acceptability of child pornography, minimise the harm associated with content, and distance the individual from culpability. Greater sensitivity to self-disgust is associated with a perception that one engages in disgusting activities and behaviours and is therefore disgusting. Although child pornography is typically considered disgusting, cognitive distortions operate by obscuring the moral wrongness of a behaviour and the feelings of disgust associated with that behaviour, which then diminishes sensitivity to self-disgust. Cognitive distortions allow the individual to believe that child pornography is not wrong, therefore removing the opportunity for self-disgust.

Overall, the current study found that cognitive distortions and deviant sexual fantasy were associated with lower levels of sexual disgust and self-disgust, supporting the idea that cognitive processes, beliefs and attitudes can influence the way disgust is experienced. It is important not to discount other explanations for why cognitive distortions and fantasy are associated with less disgust, however. For example, it is possible that less disgust sensitivity increases vulnerability to the influence of cognitive distortions and deviant sexual fantasy. Or, perhaps an entirely different variable is responsible for the presence of cognitive distortions, fantasy and diminished disgust. However, there is more theoretical support for a relationship between cognitive distortions, fantasy and disgust being explained as a top-down process, where cognitions, attitudes, beliefs and sexualised images mitigate disgust by reframing harmful behaviour as justified and normal.

Feelings Related to Child Pornography Use

That said, cognitive distortions are not bullet-proof defence mechanisms against uncomfortable feelings about child pornography. Although on average, study group participants felt neutral about statements regarding feeling bad or guilty in relation to using

child pornography, a reasonable proportion reported feeling bad and guilty when using child pornography and after using child pornography. A small number of participants who indicated that they felt better while using child pornography reported also feeling guilty during and after using child pornography.

Guilt and shame have been described as forms of disgust directed towards an action one has performed, or towards the self (Overton et al., 2008), suggesting that for at least some people, there are conflicting feelings associated with the use of child pornography. Interestingly, more recent child pornography use was associated with increased sexual disgust. A small amount of research suggests that after masturbating to child pornography, some users found the content distasteful and aversive, despite being initially aroused by it (Quayle & Taylor, 2002). This might explain why people felt more sensitive to disgust following recent use, and suggests that the influence of disgust is variable depending on state and environment.

Thoughts about Child Pornography

A central premise of the current study was that people generally agree that the use of child pornography is disgusting. Indeed, comparison group participants reported finding people who use child pornography disgusting, with the majority condemning them as “extremely disgusting”. Study group participants appeared cognisant of perceptions about them, and agreed that other people who didn’t engage in use would find them disgusting due to their use, but generally disagreed with this judgement themselves.

Onset and Frequency of Exposure to Pornography

Early onset and frequent use of adult pornography might be important precursors for the use of child pornography and the abnormal development of disgust. Study group participants reported first being exposed to adult pornography around age 12, which was

significantly younger than comparison. Study group participants also reported accessing adult pornography significantly more frequently than comparison.

These results support prior research that has identified early sexual experiences, including exposure to pornography, as developmental catalysts for adult deviant sexual fantasies and behaviours and sexual offending (Seto & Lalumière, 2010; Fagan et al., 2002; Maniglio, 2011; Roe-Sepowitz & Krysik, 2008;). For study group participants, exposure to adult pornography preceded exposure to child pornography. This trajectory is reflected in the literature, where child pornography users progress from viewing to legal pornography to viewing child pornography (Winder et al., 2015). In a study conducted by Wéry and Billieux's (2016), approximately half of male pornography users reported that they had found themselves searching for content they formerly considered disgusting or unappealing.

Additionally, the current study found that the younger an individual was exposed to adult pornography, and the more frequently they used adult pornography, the less sensitive they were to sexual disgust and self-disgust. This suggests that there may be a progression in severity of content, starting with legal, consensual pornography and moving to child pornography, and that this process may be related to disgust desensitisation; however, this has not been reliably assessed. Similarly, both cognitive distortions and deviant sexual fantasy were associated with earlier exposure to, and more frequent use of, adult pornography. It seems that early and repeated sexual experiences affect the development of disgust, potentially increasing the likelihood of engagement with child pornography.

Childhood Sexual Victimization

Continuing with a developmental perspective, early experiences of sexual abuse may influence disgust and perceptions of sexual behaviour. Experiences of sexual abuse victimisation before and after the age of 12 were extremely similar between groups, which conflicts with existing research that has demonstrated a higher prevalence of historical sexual

victimisation among offenders (Plummer & Cossins, 2018). Early experiences of sexual abuse were strongly correlated with later experiences of sexual abuse, however, which reflects findings within the literature about revictimisation (Walker et al., 2019).

In the current study, early childhood abuse was associated with contact sexual offending against children during adulthood, and sexual abuse in later childhood was associated with less cognitive distortions about children and sex. Similarly, later experiences of sexual abuse were associated with increased taboo related sexual disgust. This suggests that experiences of victimisation have important consequences for the likelihood of offending behaviour, where early experiences increase the probability of offending and later experiences decrease the probability of offending, potentially through a reduction in cognitive distortions and heightened sensitivity to disgust.

Hypersexuality

Previous literature suggests that hypersexuality, compulsive sexual behaviour and sexual preoccupation might be capable of overpowering disgust, facilitating the use of child pornography (Seto & Ahmed, 2014). One surprising finding in the current study was that the study group and comparison group displayed approximately equivalent levels of sexual approach and avoidance behaviour. This seems to contradict research suggesting that propensity for arousal and disinhibition facilitate offending behaviour. However, internal consistency of the sexual inhibition domains for the SIS/SES-SF (Carpenter et al., 2010) was low, and therefore, perhaps differences were present but were unable to be detected by the measure.

Another possible explanation is that people who use child pornography but don't also engage in contact sexual offending against children have a greater capacity for self-control and lower levels of impulsivity, preventing contact offending (Howitt & Sheldon, 2007; Babchishin et al., 2011). Due to sample size, the current study did not analyse study

participants who had and had not engaged in contact offending-related behaviour separately. This may impact the interpretation of results and cloud differences in sexual inhibition and sexual excitation between groups. However, for the study group, greater sexual inhibition was associated with more contact offending-related behaviour, which seems to contradict the hypothesis that child pornography users who don't engage in contact offending-related behaviour have greater self-control and are less impulsive than contact offenders. One theory to explain this finding is that child sexual offending is borne from an inability to form intimate connections with age-appropriate peers. Children are then targeted because they are perceived to be less rejecting (Mann et al., 2010; Ward & Siegert, 2002)). According to this theory, inhibition may relate to attaining sexual intimacy with adults rather than inhibition for sexual engagement with children.

Limitations and Future Directions

The current study has several limitations which are discussed in relation to suggestions for future research. Firstly, study group sample was small and likely non-representative of the general population of child pornography users. Given the sensitive nature of the study, recruitment of people who use child pornography from the community was challenging. Members of various platforms expressed distrust and wariness about the research, the researchers' intentions, and the security of systems to ensure anonymity. This poses uncertainty about whether individuals who did agree to participate are representative of a much larger proportion of people who did not agree to participate.

It is also likely that our recruitment method barely scratched the surface, as it was difficult to find and access platforms and communities for advertisement. Although snowball sampling was employed, only a handful of platforms were utilised for recruitment. One organisation (Boy Chat) used for recruitment is a pedophilia advocacy group that supports the sexual abuse of children, suggesting that some participants hold atypical views about

offending, influencing responding behaviour. This may support one explanation for why significant differences in moral disgust between groups were not found – study group participants did not believe that child pornography was morally wrong, and therefore applied different moral appraisals to the use of child pornography than was applied to other morally insulting behaviour.

Other organisations utilised for recruitment focused on providing help for people who were attracted to children, which may have meant that participants recruited through these platforms were help-seeking and primarily used child pornography due to an underlying attraction to children. These recruitment methods and sample characteristics cast doubt over whether findings can be generalised to the larger, diverse group of child pornography users in the community. In future, the methodology could be revised to reduce self-selection bias, increase sample size and improve representation.

Secondly, although a decision was made to include female participants due to sample size constraints, the study design is predicated on research nearly exclusively conducted with male offenders, making it difficult to draw well-supported conclusions about the study sample in its entirety. Because females comprised a significantly greater proportion of the comparison group than the study group, conclusions drawn about differences between groups may be unduly biased by the confounding influence of gender. An effort was made to examine the correlation between gender and key variables, and integrate this with the interpretation of findings, but the study did not have adequate power to explore gender differences explicitly. Future research with larger sample sizes should examine female and male participants separately. Additionally, greater efforts to investigate female child pornography offenders would help fill a gap in the existing literature.

Thirdly, the study design was largely novel and relied upon triangulation of vaguely related literature rather than a body of well-established prior research. Child pornography use

has only recently emerged as a phenomenon worthy of exploration, and current research is dominated by forensic samples. Utilising a community sample was not only difficult due to recruitment barriers, but the lack of precedence also meant that an eclectic approach to measurement was necessary. Although measures were well-developed, their applicability to a community sample of child pornography offenders was unknown. This means that findings should be interpreted with caution, and further research needs to consider developing specific tools for community child pornography users.

Furthermore, as a broader theoretical base to the current study, pornography research is fraught with conflicting findings. A 2019 review of 100 studies on pornography use revealed that despite 50 years of research, estimates for use ranged between 10% and 99% of men and between 0% and 88% of women (Kohut et al., 2020). One reason for this is the inaccuracy of self-report measures – people’s perceptions of their pornography use is different to their actual use. This is an important limitation of the current study. Given its illegality, self-reported child pornography use is, presumably, even further from the truth than self-reported adult pornography use. Unfortunately, with community samples where anonymity needs to be protected, self-report is one of the few available means of data collection.

Conclusion

It is important to keep in mind that the current study is exploratory, and the narrative developed to explain initial findings is still largely hypothetical. It is very possible that the relationships between disgust and the use of child pornography is more complicated than discussed. Despite this, the current study sought to fill a hole in the existing literature by exploring disgust among a community sample of child pornography users. Preliminary findings are encouraging, and largely support the idea that people who use child pornography have a complex relationship with disgust. Child pornography users in our sample were less

sensitive to sexual and pathogen disgust than our sample of adult pornography users, but moral disgust wasn't as obviously affected. Cognitive distortions, deviant sexual fantasy, as well as early and frequent exposure to pornography likely interact with perceptions of morality and disgust among people who use child pornography. These relationships warrant further investigation, and represent a promising direction for future research.

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Appendices

Appendix A: University of Canterbury Human Ethics Committee Approval Letter



HUMAN ETHICS COMMITTEE

Secretary, Rebecca Robinson
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Ref: HEC 2020/27

7 August 2020

Anneliese Westerman
Psychology, Speech and Hearing
UNIVERSITY OF CANTERBURY

Dear Anneliese

The Human Ethics Committee advises that your research proposal "Disgust Sensitivity Amongst Child Pornography Users" has been considered and approved.

Please note that this approval is subject to the incorporation of the amendments you have provided in your emails of 21st May, 8th June, and 30th July 2020.

Best wishes for your project.

Yours sincerely

A handwritten signature in black ink, appearing to be 'D. Sutherland'.

Dr Dean Sutherland
Chair
University of Canterbury Human Ethics Committee

Appendix B: Study Advertisement and Information***Study Group Advertisement***

“We are conducting a survey about child pornography use. The survey is completely anonymous. We will not know who you are, and we will not be able to find out who you are. Any information you provide in the survey will be completely anonymous and untraceable. We will not be collecting your IP address or any identifiable information about you. Please select the link below to complete the survey. The survey will take approximately 20 minutes to complete. After completing the survey, you may choose to go into an anonymous draw to win one of four Bitcoin prizes worth \$100 USD each. If you choose to go into the anonymous draw, you will be asked to provide your Bitcoin Wallet ID. Please share this survey.”

Study Group Information

“We are researchers from the University of Canterbury running a survey about disgust and child pornography. The information you share is anonymous. Your identity will be unknown and untraceable. Your IP address will not be recorded and we will not be asking any identifying information about you (e.g., name, date of birth, region etc.). After completing the survey, you may choose to go into an anonymous draw to win one of four Bitcoin prizes worth \$100 USD each. If you choose to go into the anonymous draw, you will be asked to provide your Bitcoin Wallet ID. If you are unfamiliar with Bitcoin, you may wish to visit <https://bitcoin.org/en/> for information. Your participation is voluntary and you can withdraw at any time by closing the browser. Please note that if you withdraw before completing the survey you will not go into the draw to win one of four Bitcoin prizes worth \$100 USD each. The data will be stored securely and used as part of a Master of Arts thesis at the University of Canterbury, and may also be published in international peer-reviewed journals. Your anonymity is assured. The data will be destroyed after 5 years. You may have emotional reactions to some of the questions in the survey that ask about child pornography, sexual contact between children and adults, and sexual attraction to children.

The following help to address your use of child pornography is available:

<https://www.b4uact.org/>

<https://www.lucyfaithfull.org.uk/>

<https://troubled-desire.com/en/>

The following Mental Health help is available:

United States

<https://www.mentalhealth.gov/get-help>

Canada

<https://www.canada.ca/en/public-health/services/mental-health-services/mental-health-get-help.html>

United Kingdom

<https://www.nhs.uk/conditions/stress-anxiety-depression/mental-health-helplines/>

Australia

<https://www.healthdirect.gov.au/mental-health-helplines>

New Zealand

<https://www.mentalhealth.org.nz/get-help/in-crisis/helplines/>

Contact information of the researchers:

Jacinta Cording

Jacinta.cording@canterbury.ac.nz

Please note that if you choose to contact us directly and in your email(s) provide details about your identity along with information suggesting that you or others around you are at

imminent risk of harm, we will be obligated to report the details to relevant authorities or organisations that can reasonably prevent this harm.”

Comparison Group Information

“In this study, you will be asked a range of questions related to disgust, your own sexual experiences, and your thoughts on certain behaviours.”

Appendix C: Supplementary Questions***Pornography Use***

Have you ever accessed or used adult pornography? [Yes/No]

If Yes

Please indicate the age you were when you first viewed pornography. The first time you viewed pornography may have been intentional or unintentional

Please indicate the age you were when you first intentionally accessed or used pornography

When did you last access or use pornography? (within the last 7 days, within the last 4 weeks, within the past 6 months, within the past year, more than a year ago)

How frequently do you access or use pornography? (seldom, monthly, weekly, daily)

Because of changes in my life related to the COVID-19 pandemic, my use of pornography has...(increased, stayed about the same, decreased)

Control Group

Please rate how disgusting you find people who use child pornography, where 1 means you do not find people who use child pornography disgusting at all and 7 means that you find people who use child pornography extremely disgusting

Study Group

Child pornography use onset and frequency

Please indicate the age you were when you first intentionally accessed or used child pornography

When did you last access or use child pornography? ((within the last 7 days, within the last 4 weeks, within the past 6 months, within the past year, more than a year ago)

Age Preference

Please indicate the group(s) of children you are attracted to. You may select more than one group (babies/toddlers aged around 0-5; children before puberty aged around 6-11; children during puberty aged around 12-15; children after puberty aged around 16-17)

Please indicate the group(s) of children that is/are shown in the child pornography you use. You may select more than one group (babies/toddlers aged around 0-5; children before puberty aged around 6-11; children during puberty aged around 12-15; children after puberty aged around 16-17)

Treatment

Have you ever looked for any help to stop using child pornography? [Yes/No]

If Yes

What help did you look for?

Thoughts

Compared to the average child pornography user, my use of child pornography is...(much more harmful, slightly more harmful, about the same, slightly less harmful, much less harmful)

My use of child pornography is disgusting (1 strongly disagree, 7 strongly agree)

Other people's use of child pornography is disgusting (1 strongly disagree, 7 strongly agree)

Other child pornography users are disgusting (1 strongly disagree, 7 strongly agree)

Other people who do not use child pornography find my use of child pornography disgusting
(1 strongly disagree, 7 strongly agree)

Other people who do not use child pornography find me disgusting because I use child
pornography (1 strongly disagree, 7 strongly agree)