Mechanisms Contributing to the Specificity of Gynephilic Men's Sexual Responses

by

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Abstract

Men's sexual responses have historically been characterized by their gender specificity, meaning that men show stronger genital and subjective arousal to preferred (i.e., sexual stimuli that include one's preferred gender) versus non-preferred (i.e., sexual stimuli that do not include one's preferred gender) sexual stimuli. But recent work suggests that many gynephilic (i.e., sexually attracted to women) men show varying degrees of same-sex attraction, fantasies, and behaviours. Previous research on men's gender-specific sexual responses has not investigated potential bidirectional relationships between men's attentional, affective, and genital responses to non-preferred sexual stimuli. New information about these relationships will contribute to our understanding of gynephilic men's capacity for nonexclusive sexual attractions.

Two models of sexual responding, the information processing model and the incentive motivation model, include pathways that detail the role of initial attention, controlled attention, and affect in activating or inhibiting arousal to nonpreferred sexual stimuli. Across two studies, these models of sexual responding are used as a framework to explore how greater negative affect (i.e., homonegativity and trait-level disgust) and attentional biases (i.e. vigilant initial attention and avoidant controlled attention) reduce men's sexual responses to non-preferred sexual stimuli. In Study 1, which examined men's detection of human stimuli at the earliest stages of stimulus processing, gynephilic men were more accurate when they identified images of nude women than when they identified images of clothed men or clothed women. There was no significant difference in their speed and accuracy, however, when detecting nude women versus nude men, suggesting that gynephilic men's gender-specific sexual responses may only occur during later stages of processing. In Study 2, which examined men's visual attention and genital responses during later stages of stimulus processing, greater levels of homonegativity and

trait-level disgust predicted attentional avoidance of sexual stimuli featuring men, as well as lower genital responses to these stimuli. Results expand our current understanding of men's sexuality by identifying factors that contribute to gender-specific and gender-nonspecific sexual responses in gynephilic men. Future work should explore whether gynephilic men's sexual behaviours become increasingly malleable as society continues to become more accepting of same-sex sexuality.

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our early discussions about the many dimensions of homonegativity and their subsequent effects on arousal and behaviour. These conversations gave me an informal crash-course into queer theory before I picked up Dr. Sedgewick's book, and I am glad I was introduced to these ideas by such a thoughtful and warm-hearted person. Finally, I am grateful to the Queen's University Psychology Department for being such a kind and supportive environment these past few years. I look forward to working with this group for many more years!

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Chapter 1: Introduction

In large representative samples, the distribution of men's sexual orientations tends to be bimodal (i.e., exclusively heterosexual or exclusively same-sex attracted; Bailey, 2009; Bailey, Dunne, & Martin, 2000; Diamond, 1993) and their orientations more stable over time than women's sexual orientations (Savin-Williams, Joyner, & Rieger, 2012). In sharp contrast, women's sexual behaviours and identities appear to be more fluid (Baumeister, 2000; Diamond, 2003), defined as "a sensitivity to situational, interpersonal, and contextual influences which may facilitate shifts in sexual attraction, behaviour, and identity" (Diamond, Dickenson, & Blair, 2017, p. 193). Fitting with women's potentially greater sexual fluidity, there is an accumulation of evidence that men show gender-specific patterns of genital responding to sexual stimuli (i.e., stronger genital responses to stimuli depicting their preferred gender) whereas heterosexual women's sexual responses tend to be gender nonspecific (Chivers, 2010; Chivers, Rieger, Latty, & Bailey, 2004; Chivers, Seto, & Blanchard, 2007).

Despite the traditionally bimodal view of men's sexuality, discrepancies in men's sexual attractions, behaviours, and identities have been well-documented in the social sciences (Silva, 2015; Ward, 2015). In a recent survey of heterosexually-identified men, 51% of respondents reported attractions, fantasies, or behaviours that were inconsistent with their sexual orientation (Vrangalova & Savin-Williams, 2010). Across six longitudinal studies, a small but consistent minority of heterosexually-identified men reported same-sex behaviour (2% - 3.4%, Diamond, 2016; McCabe, Brewster, & Tillman, 2011; Mustanski, Birkett, Greene, Rosario, Bostwick, & Everett, 2014). A recent review of international longitudinal studies that included sexual-minority populations suggested that, contrary to popular belief, men's attractions may not have a

lower capacity for change over time than women's (Diamond, 2016; Diamond, Dickenson, & Blair, 2017).

The mounting evidence that some men have the capacity for nonexclusive attractions, and that there can be fluidity in these attractions over time, fits with previous work that shows men do have genital responses to non-preferred sexual stimuli (Adams, Wright, & Lohr, 1996; Chivers, Seto, & Blanchard, 2007). Whereas a body of literature focused on group-level differences between men and women has suggested that men's sexual responses are gender-specific, this research overlooks the variability that is possible in gynephilic men's responses to sexual images of men. A better understanding of how men process and respond to sexual images of men may give insight into men's capacity for nonexclusive sexual attractions. In the present studies, two models of sexual response are used to identify affective and attentional mechanisms that may contribute to gynephilic men's gendered patterns of sexual response.

Models of Sexual Response

Information Processing Model

The information processing model (Janssen, Everaerd, Spiering, & Janssen, 2000; IPM hereafter, see Figure 1) illustrates the interaction between automatic and controlled cognitive processes that occur during early and later stages of sexual stimulus processing. The central pathway of this model defines two information processing stages that occur at the automatic or pre-attentive level: appraisal and response generation. The appraisal stage occurs during the earliest stages of sexual stimulus processing. During this stage, a sexual stimulus is encoded, matched in memory, and given emotional meaning. Then at the subsequent response generation stage, emotional meaning integrates with response plans, which may result in sexual or genital arousal. This automatic response can influence one's later affective experience (e.g., arousal or

disgust) and initial signs of genital response. The IPM also describes consciously controlled attentional processes that occur during later stages of stimulus processing and have a bidirectional effect on these automatic processes. For example, if a man avoids attending to an erotic video, he can theoretically minimize or prevent a sexual appraisal and subsequent sexual response to the stimulus.

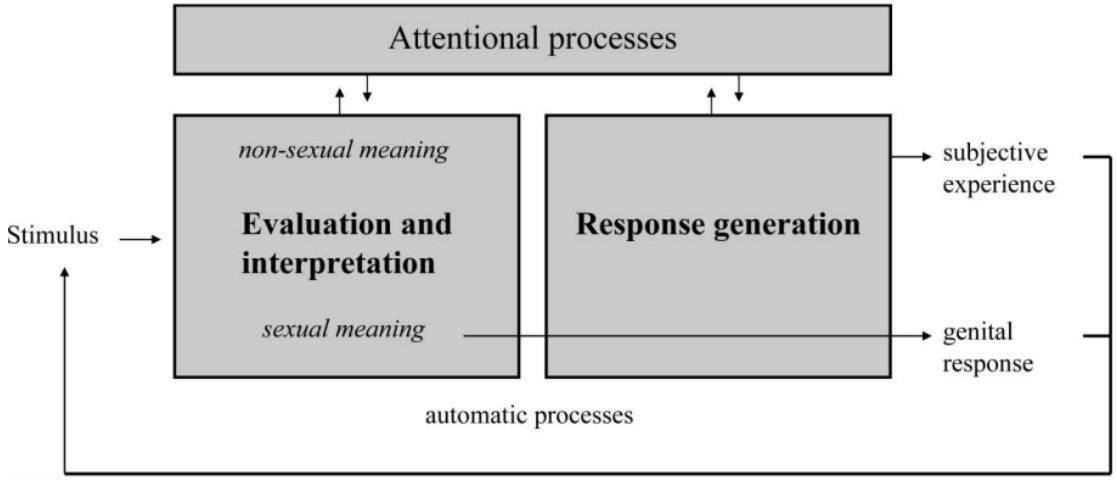

Figure 1. The information processing model, according to Janssen, Everaerd, Spiering, & Janssen, 2000. Reprinted from "Disorders in sexual desire and sexual arousal in women, a 2010 state of the art," by S. Both, E. Laan, & W. Weijmar Schultz, 2010, *Journal of Psychosomatic Obstetrics & Gynecology*, *31*(4), 209.

Incentive Motivation Model

Toates' (2009) incentive motivation model (IMM hereafter, see Figure 2) offers a more detailed description of the cognitive processes that activate or inhibit sexual behaviour during later stages of sexual stimulus processing. The model proposes two levels of inhibition that occur after the "early perceptual analyses" stage of stimulus processing (described by the IPM): aversion-related and goal-directed. Both inhibitory processes are particularly relevant to men's sexual responding to non-preferred stimuli. Aversion-related inhibition activates the amygdala and characterizes automatic reactions to external stimuli, such as those eliciting disgust (Zald,

2003). In contrast, goal-directed inhibition is associated with the prefrontal cortex and can be characterized as a controlled method of self-regulation or even, in some cases, "resisting temptation" (Toates, 2009, p. 175). Goal-directed attentional avoidance is a self-regulation strategy (Armstrong & Olatunji, 2012) that is commonly observed when people focus on a neutral target to avoid an aversive stimulus (e.g., one that elicits disgust).

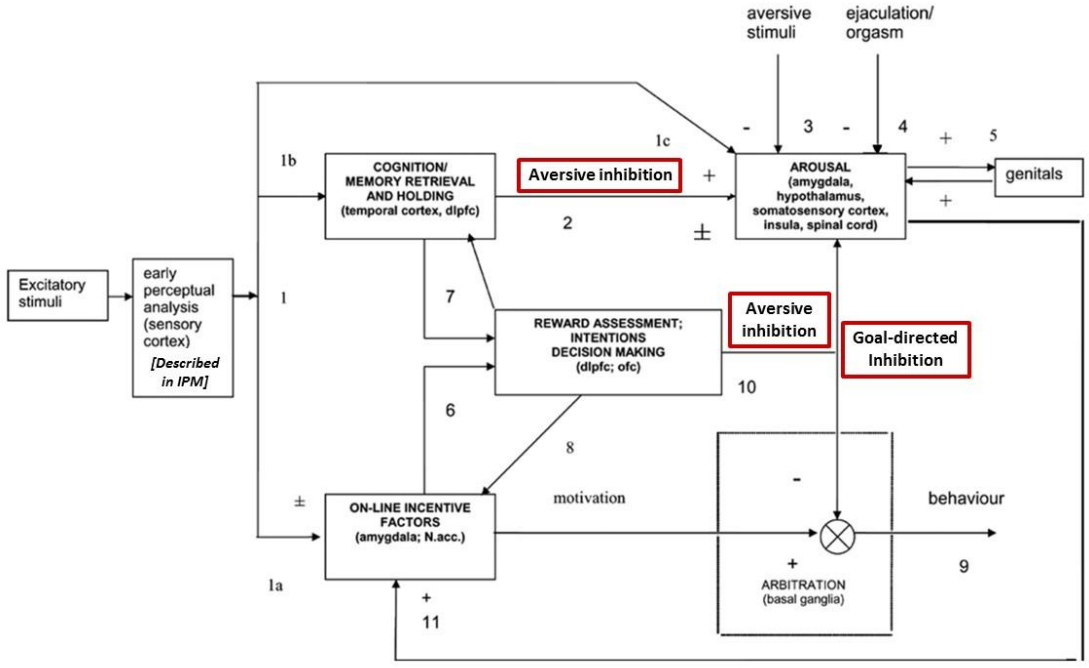

Figure 2. The incentive motivation model, according to Toates, 2009. Reprinted from "An integrative theoretical framework for understanding sexual motivation, arousal, and behavior," by F. Toates, 2009, *Journal of Sex Research, 46*(2-3), 173.

A study by Samson and Janssen (2014) offers clear illustrations of the aversion-related and goal-directed inhibitory reactions that can be activated during later stages of sexual stimulus processing. In their study, men had the choice of viewing sexual or nonsexual content in two partially-obscured videos, one with preferred sexual content and the other with non-preferred sexual content. Gynephilic men demonstrated an aversion-related inhibitory response to the non-preferred sexual content, such that they reported feeling weaker positive and stronger negative

affect than when they viewed the preferred sexual content (Samson & Janssen, 2014). Gynephilic men also showed goal-directed inhibition by choosing to view the non-preferred sexual content for less time than the preferred sexual content (Samson & Janssen, 2014). Similar visual avoidance strategies were observed in a separate study that used still sexual images, where total viewing time of non-preferred stimuli was significantly lower than total viewing time of preferred stimuli (Dawson & Chivers, 2016). The men in Samson and Janssen's (2014) study also reported significantly lower levels of sexual arousal to non-preferred stimuli versus preferred stimuli (Samson & Janssen, 2014).

Inhibitory responses to non-preferred sexual stimuli

According to the IPM, the first step of processing sexual stimuli occurs at a pre-attentive level, when a stimulus is appraised as "sexual" or "nonsexual" and paired with an emotional meaning. Previous work has found that people can detect evolutionarily-relevant targets (e.g. faces) significantly faster and more accurately than neutral objects (e.g. vehicles; Crouzet, Kirchner, & Thorpe, 2010). Given that sexual images of orientation-congruent people (e.g., nude women, for gynephilic men) are "evolutionarily relevant", assessment, processing, and response to preferred sexual stimuli could be initiated significantly earlier than non-preferred sexual stimuli. If men detect preferred sexual stimuli significantly more quickly than non-preferred stimuli at a pre-attentive level, then they might also choose to ignore any sexually-relevant stimuli that are not detected with the same speed (e.g., non-preferred sexual stimuli). Preliminary evidence suggests that gynephilic men orient more quickly to women (M = 0.84s) versus men (M = 1.71s; Dawson & Chivers, 2016), but because both categories of sexual stimuli were presented simultaneously during this study, more work is needed to fully understand initial orientation toward gendered sexual stimuli.

The IMM proposes that sexual response inhibitory mechanisms, such as affective responses, contribute to men's gender-specific sexual responses during subsequent stages of stimulus processing. Some gynephilic men report feeling significantly more disgust upon viewing non-preferred sexual stimuli than when viewing neutral stimuli (Freund, Langevin, Cibiri, & Zajac, 1973). Greater disgust sensitivity also predicts holding unfavorable views about gay people (Inbar, Pizarro, Knobe, & Bloom, 2009), while greater homonegativity (i.e., the quality of reacting negatively to nonheterosexual behaviour or identities; Grey, Robinson, Coleman, & Bockting, 2013) is associated with a stronger startle eye blink response to gay male stimuli (Mahaffey, Bryan, & Hutchison, 2005). This relationship between disgust, homonegativity, and gynephilic men's disapproval of same-sex sexuality could be a mechanism for aversion-related inhibition, described by the IMM, which modulates gynephilic men's sexual responses to non-preferred sexual stimuli.

Negative affect could also play a role in the speed and accuracy with which men detect non-preferred sexual stimuli. Gynephilic men who are low in homonegativity might not have a strong negative reaction to viewing nude men, whereas men who are high in homonegativity might exhibit attentional biases after being reminded of the aspects of same-sex sexuality that upset them. Previous research suggests that anxious individuals show greater vigilance for threat during visual search tasks (Armstrong & Olatunji, 2012); similarly, it could be the case that homonegativity is associated with gynephilic men's faster detection of nude men.

Homonegativity as a predictor of visual avoidance of non-preferred sexual stimuli

While variability has been observed in men's aversion-related (i.e. homonegativity and disgust) and goal-directed (i.e. viewing patterns) inhibitory responses, it is not known whether they act as distinct levels of inhibition or if they share a relationship with each other, as proposed

by the IMM (Toates, 2009). To explore this possibility, I performed analyses on extant visual attention data collected for two studies in the Queen's Sexuality and Gender Laboratory. Participants in both studies included predominantly and exclusively gynephilic men (Study 1: N = 47; Study 2: N = 37). The stimuli in Study 1 included 40 image pairs of men's and women's nude bodies presented for 10s duration in a forced attention paradigm. Study 2 included eight 20s silent videos that featured a nude man engaged in nonsexual (exercise) and sexual (masturbation) activities, as well as couples engaged in penetrative sexual activities (man-man; man-woman). I calculated a homonegativity composite to measure participants' sexual prejudice and discomfort with their homoerotic potential, with high scores indicating greater sexual prejudice (Tassone, Dawson, & Chivers, 2018).

In Study 1, men with higher levels of homonegativity tended to spend less time viewing nude men. In Study 2, homonegativity was negatively associated with participants' total fixation toward nude men in both the exercise and masturbation videos. In addition, homonegativity was negatively associated with total fixation toward the receptive man in the man-man sexual stimuli. In contrast, homonegativity was not associated with total fixation toward the insertive man (i.e., the man sexually penetrating his partner) in the man-man coupled film or in the man-woman coupled film (see Figure 3). Participants with higher levels of homonegativity also spent less time viewing men's genitals in the videos that exclusively featured their non-preferred gender. These results suggest that when men view non-preferred sexual stimuli, variability in aversion-related and goal-directed inhibitory factors influence each other in addition to affecting men's sexual responses to these stimuli.

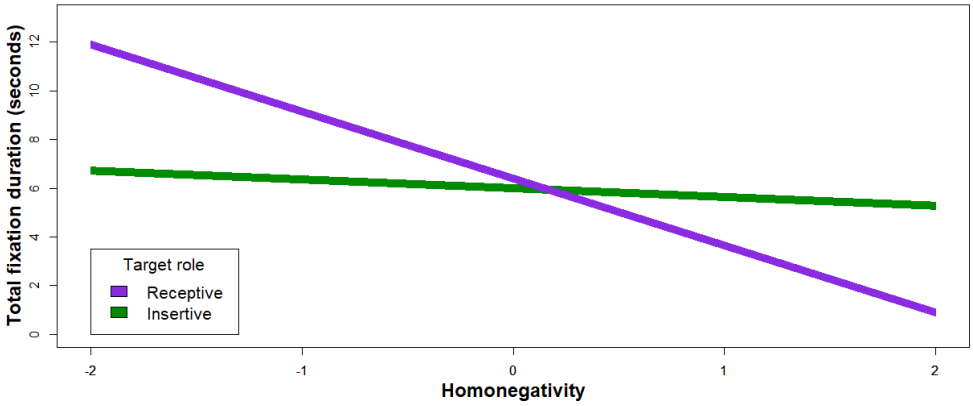

Figure 3. Homonegativity predicting total fixation duration toward receptive and insertive actors in films of male-male sexual intercourse.

Contradictions in the gender specificity of men's sexual responses

The aforementioned findings highlight the variability in men's aversion-related (i.e., homonegative) responses, and their association with variation in men's goal-directed inhibitory responses (i.e., viewing patterns). This fits with evidence that some men do show genital responses to non-preferred sexual stimuli, with effect sizes ranging from small to medium (Adams, Wright, & Lohr, 1996; Chivers & Bailey, 2005; Chivers, Rieger, Latty, & Bailey, 2004; Rieger, Chivers, & Bailey, 2005). Chivers, Seto, and Blanchard (2007) found that heterosexual men showed significant increases in penile tumescence while watching a video of two men engaged in sexual intercourse (d = 0.67, compared with a neutral stimulus), but not while watching a man masturbating alone (d = 0.22). These responses to men's non-preferred sexual stimuli suggest that "the difference in women's and men's sexual arousal patterns is one of degree rather than kind" (Chivers, Seto, & Blanchard, 2007, p. 1118). Interestingly, despite exhibiting some genital response to non-preferred sexual stimuli, gynephilic men typically do not report elevated levels of arousal (Chivers & Bailey, 2005; Rieger, Chivers, & Bailey, 2005) and have even reported finding neutral stimuli (e.g., landscapes) more sexually appealing or less disgusting than non-preferred sexual targets (Freund, Langevin, Cibiri, Zajac, 1973; Israel &

Strassberg, 2009). The contradiction between gynephilic men's affective experiences and genital responses might result from goal-directed inhibitory strategies. Gynephilic men could choose to actively avoid non-preferred sexual stimuli following the experience of genital arousal, suppressing any continued feelings of affective arousal. This proposed attentional strategy fits with Toates' description of goal-directed inhibition as a potential strategy for resisting temptation (Toates, 2009). The inconsistencies between gynephilic men's genital responses and affective experiences underscore the importance of understanding how gynephilic men process and respond to non-preferred sexual stimuli.

Current Study Objectives

Recent evidence suggests that men experience varying degrees of sexual arousal to non-preferred sexual stimuli, but minimal work has examined interindividual variability in men's responding to non-preferred sexual stimuli. Across two studies, I explored affective and attentional mechanisms that contribute to gender-specific and gender-nonspecific sexual responses in gynephilic men. During the earliest stages of sexual arousal (i.e., automatic or pre-attentive visual processing of sexual cues), I predicted that gynephilic men would orient to nude women more quickly and accurately than men and clothed women, and greater homonegativity and trait-level sexual disgust sensitivity would predict faster and more accurate initial attention toward nude men. During later stages of sexual arousal (i.e. controlled visual processing of sexual cues), I predicted that trait-level negative affect (i.e. homonegativity and disgust) would be inversely related to controlled attention toward, and genital response to, nude men. In addition, I predicted that controlled attention to nude men would mediate the inverse relationship between negative affect and genital response to nude men. I also proposed a time-lagged, inverse relationship between genital response and controlled attention toward nude men, such that

controlled attention toward nude men would be shorter following men's peak genital response to these stimuli. This work tests the strength and direction of the connections between aversive-related inhibitory reactions, attentional processes, and genital responses that are proposed in the IPM and IMM. New information about the nature of these relationships will contribute to our understanding of gynephilic men's capacity for nonexclusive sexual attractions.

Chapter 2: Study 1

A better understanding of what occurs during each stage of sexual stimulus processing when men view non-preferred sexual stimuli may help explain why some gynephilic men have a capacity for nonexclusive sexual attractions. According to the IPM, sexual stimuli are processed at an automatic, pre-attentive level during the earliest stages of stimulus processing. This automatic process triggers later attentional processes that influence whether the viewer will continue looking toward the stimulus, which affects subsequent genital responses and subjective experiences. Study 1 (see Appendix A for GREB clearance letter) examined gynephilic men's initial attention to non-preferred sexual stimuli at the very earliest stages of stimulus processing. First, this study examined whether gynephilic men detected preferred sexual stimuli more accurately and faster than non-preferred sexual stimuli. Previous research has found that humans can detect evolutionarily relevant stimuli more accurately and faster than stimuli that is less evolutionarily relevant (Crouzet, Kirchner, & Thorpe, 2010). Measures of accuracy and speed of initial stimulus detection have been used to investigate early processing in the visual system that was once only measurable through electrophysiological techniques (Crouzet, Kirchner, & Thorpe, 2010), therefore this methodology offers new insight into the earliest stages of sexual processing. This study also considered whether aversion-related inhibitory traits (i.e., individual differences in experiencing negative affective reactions) influence the accuracy and speed with which gynephilic men detect non-preferred sexual stimuli.

Research Aims and Hypotheses

Aims: 1) To examine whether preferred sexual targets capture gynpehilic men's attention more accurately and faster than preferred nonsexual targets, non-preferred sexual targets, and non-preferred nonsexual targets. 2) To examine whether greater trait-level sexual disgust sensitivity

and homonegativity predicts a hypervigilant (i.e., one that is more accurate and faster) pattern of initial responding to non-preferred sexual targets.

Using a saccadic choice paradigm, participants viewed pairs of images (one target, one neutral) on the left and right side of a computer screen and were told to saccade (i.e. rapidly move their eyes) toward the image of a person as accurately and quickly as possible. The experimental targets depicted full-body images of individual people who varied by gender (woman vs. man) and sexual content (nude vs. clothed).

Hypothesis 1: Gynephilic men would identify nude women more accurately than they would identify clothed women, nude men, and clothed men.

Hypothesis 2: Gynephilic men would be faster when initiating saccades toward nude women than when they were initiating saccades toward clothed women, nude men, and clothed men.

Hypothesis 3: Greater trait-level sexual disgust sensitivity and homonegativity would predict greater accuracy when identifying nude men.

Hypothesis 4: Greater trait-level sexual disgust sensitivity and homonegativity would predict faster initiation of saccades toward nude men.

Method

Participants

Thirty predominantly and exclusively gynephilic men between ages 18 and 61 (M = 25.7) were recruited (see Table 1 for demographic characteristics). Based on the large effect (d = 1.91) of sexual target gender on initial attention reported by Dawson and Chivers (2016), a priori power analysis indicated that this sample size would be sufficient to detect a large significant difference in initial attention toward nude women vs. nude men (99% power). Participants had to

be fluent in English, have normal or corrected to normal vision, have viewed sexually explicit media before, and be predominantly or exclusively sexually attracted to women in order to be eligible to participate in the study.

	Study 1	
	N	%
Age (years)		
18-25	22	73.33%
26-35	4	13.33%
36-45	2	6.67%
46-55	0	0.00%
56-65	2	6.67%
Education (in progress or completed)		
High school	2	6.67%
Community college	3	10.00%
University	21	70.00%
Graduate degree	4	13.33%
Employment Status		
Employed, full-time	8	26.67%
Employed, part-time	6	20.00%
Full-time student	14	46.67%
Currently unemployed	2	6.67%
Relationship Status		
Single	14	46.67%
Dating	11	36.67%
Engaged	1	3.33%
Married	2	6.67%
Common law	2	6.67%
No response	0	0.00%
Race/Ethnicity		
Canadian	19	63.33%
American	2	6.67%
Asian	3	10.00%
Western European	1	3.33%
2+/Other	5	16.67%

Table 1. Demographic characteristics of Study 1 sample.

Measures and Apparatus

Questionnaires.

Sexual Attractions

Sexual attractions were assessed using the Kinsey Sexual Attraction Scale (KSAS; Kinsey, Pomeroy, & Martin, 1948; Appendix B). All men reported that they had sexual attractions toward women mostly and men frequently (but not more than toward women; $n = 2$), women mostly and men occasionally ($n = 5$), or toward women only ($n = 23$).

Sexual Identity

Participants could select more than one sexual identity descriptor, and most men identified as heterosexual ($n = 24$). Some men identified as heterosexual and bisexual ($n = 2$), heterosexual and no label ($n = 1$), heterosexual and "possibly bi-curious" ($n = 1$), no label ($n = 1$), and "heteroflexible" ($n = 1$).

Homonegativity

The "Resist Heteronormativity" subscale from the Multidimensional Measure of Sexual Prejudice (MMSP; Massey, 2009; Appendix C) was used to measure participants' sexual prejudice and aversion toward their own homoerotic potential. While most homonegativity measures use a single-factor model of homonegativity, the MMSP uses a seven-factor model that differentiates between multiple factors that may impact one's attitudes toward same-sex sexuality. The "Resist Heteronormativity" subscale consists of eight items, with response options ranging from 1 (totally disagree) to 5 (totally agree). Homonegativity scores were determined by calculating the mean of the items, with high scores indicating stronger comfort with assigned sex and gender roles and expectations. This subscale was also found to have sufficient test-retest

reliability (i.e., > .50; Massey, 2009). The items demonstrated sufficient internal consistency in the present study (Cronbach's $\alpha = .86$).

Sexual Disgust

The "Sexual Disgust" subscale of the Three Domains of Disgust Scale (TDDS; Tybur, Lieberman, & Griskevicius, 2009; Appendix D) was used to assess disgust responding to sexual situations. The sexual disgust subscale includes 7 items with response options ranging from 0 (not at all disgusting) to 6 (extremely disgusting). Participants' mean sexual disgust scores from the TDDS were calculated to represent their sexual disgust responding, with high scores indicating greater sexual disgust sensitivity. Greater scores on this subscale are also associated with greater pathogen disgust and greater moral disgust (Tybur, Lieberman, & Griskevicius, 2009). The items demonstrated sufficient internal reliability in the present study (Cronbach's $\alpha = .85$).

Visual Attention. Eye movements were measured using an Eyelink 1000 (SR Research; Mississauga, ON) sampling at 1,000 Hz. The experiment was presented using Matlab (MathWorks, Inc., Natick, MA).

Experimental Stimuli. The experimental targets in Study 1 included pictures of individual people that varied by stimulus gender (woman vs. man) and sexual content (nude vs. clothed). Targets were paired with neutral stimuli (e.g., trees, houses, etc.), and the pairs appeared vertically centered on the left and right sides of the screen. All of the images were converted to grayscale and resized to 300 x 400 pixels. Participants performed 100 trials per condition (400 trials total), divided across two blocks of 50 trials. The order of the four conditions was counterbalanced across participants. A practice block with 24 trials preceded each condition's first block.

Procedure

Eligible participants were scheduled for a testing session in the Attention Lab. After standard consent procedures, the experimenter calibrated the eye-tracker and administered a practice block. In the practice and experimental blocks, the participant viewed pairs of images (one target, one neutral) on the left and right side of a computer screen. Each image pair appeared for 400 milliseconds each. The participant was told to saccade toward the image of a person as accurately and quickly as possible. After the participant confirmed that they understood the instructions, the experimental task began (see Figure 4). Each block presented 50 images that were grouped by stimulus condition (i.e., nude woman, nude man, clothed woman, clothed man). Each participant completed eight blocks of trials, with the offer of a short break after every two blocks to relieve joint tension and dry eye conditions. After participants completed all of the experimental trials, they completed the questionnaire on a computer, were debriefed about the purpose of the study, and given an opportunity to ask questions.

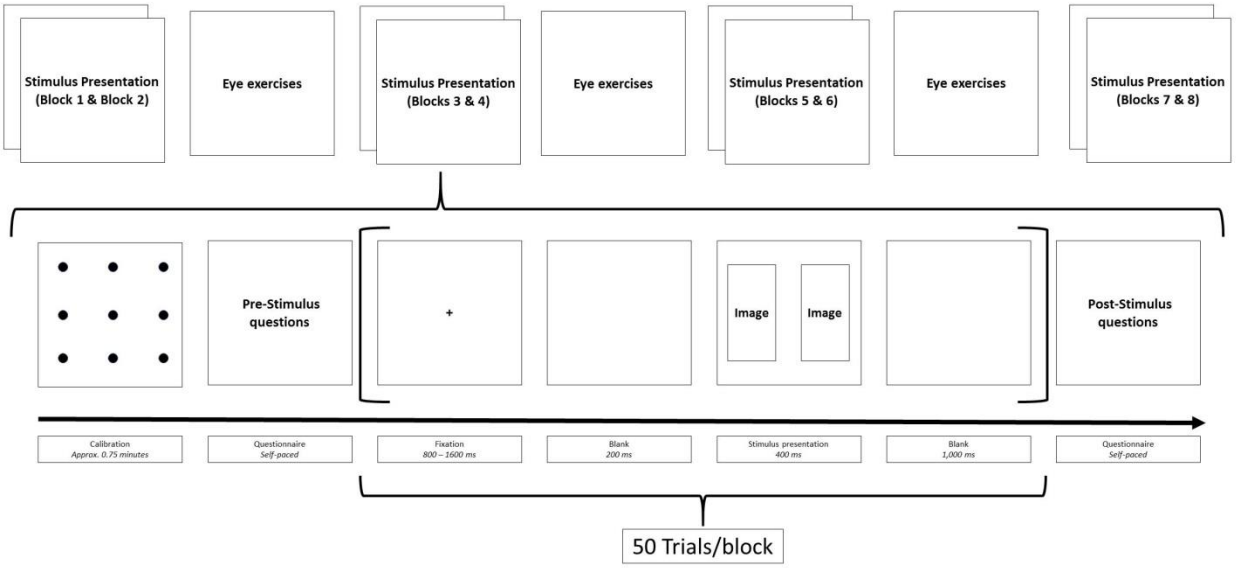

Figure 4. Experimental design for Study 1.

Data Preparation

Target accuracy. The percentage of correct initial saccades toward the target image was calculated for each of the target categories to represent how accurately stimuli were being processed at the earliest stages of processing. Previous work has found that people can detect evolutionarily-relevant targets (e.g. faces) significantly more accurately than neutral objects (e.g. vehicles; Crouzet, Kirchner, & Thorpe, 2010).

Saccadic reaction time (SRT). SRT was defined as the latency of the initiation of the first saccadic response if it was toward one of the two stimuli. SRTs were discarded if the initial saccade was made toward the distractor image (i.e., an inaccurate trial), or if the SRT was below 80ms or over 800ms (Crouzet, Joubert, Thorpe, & Fabre-Thorpe, 2012). Each participant's median SRT for each of the conditions was calculated to represent how fast participants detected the four stimulus categories. Previous work has also found that people detect evolutionarily-relevant targets significantly faster than neutral objects (Crouzet, Kirchner, & Thorpe, 2010).

Skewness and kurtosis z-scores were evaluated for target accuracy and median SRT data and compared against the normal distribution (cutoff alpha level = .001). Outliers for outcome variables were defined as values greater than 3.29 standard deviations from the mean (Tabachnick & Fidell, 2013). One outlier was removed from the clothed men target accuracy variable. One participant's data was removed from analyses due to in-session behaviour that suggested he did not put forth his best effort during the eye-tracking procedure or answer the questionnaire truthfully.

Statistical Analyses

To test the hypothesis that gynephilic men identify nude women more accurately than they identify clothed women, nude men, and clothed men (hypothesis 1), stimulus gender and

sexual content effects were assessed using a 2 (stimulus gender: women & men) x 2 (sexual content: clothed & nude) repeated measures ANOVA predicting target accuracy. Significant interactions were further examined using bootstrapped, paired-samples t-tests (5,000 iterations).

To test the hypothesis that gynephilic men are faster when initiating saccades toward nude women than when initiating saccades toward clothed women, nude men, and clothed men (hypothesis 2), stimulus gender and sexual content effects were assessed using a 2 (stimulus gender: women & men) x 2 (sexual content: clothed & nude) repeated measures ANOVA predicting median SRT. Significant interactions were further examined using bootstrapped paired-samples t-tests (5,000 iterations).

To test the hypothesis that greater homonegativity and sexual disgust is associated with greater accuracy when identifying nude men (hypothesis 3), target accuracy toward nude men was subject to a multiple linear regression with sexual disgust, homonegativity, and their interaction as predictors. To test the hypothesis that greater homonegativity and sexual disgust is associated with faster initiation of saccades toward nude men (hypothesis 4), median SRT was subject to a multiple linear regression with sexual disgust, homonegativity, and their interaction as predictors.

Results

Effects of stimulus gender and sexual content on target accuracy

I predicted that gynephilic men would identify nude women more accurately than they would identify clothed women, nude men, and clothed men (hypothesis 1; see Table 2 for descriptive statistics for target accuracy). There was a significant interaction between stimulus gender and sexual content, $F(1, 27) = 8.45$, $p = .007$, $\eta_p^2 = .24$ (see Figure 5 for a depiction of the interaction). As predicted, follow-up bootstrap paired-samples t-tests (5,000 iterations) indicated

that men were significantly more accurate when detecting nude women than clothed women, $t(27) = -5.10$, $p \leq .001$, [95% CI -0.079, -0.036]. Men were also significantly more accurate when detecting nude women than clothed men, $t(27) = -2.88$, $p = .008$, [95% CI -0.047, -0.10]. Contrary to my prediction, there was no significant difference in participants' ability to accurately identify nude women versus nude men, $t(27) = -0.96$, $p = .35$, [95% CI -0.023, 0.008]. There was no significant difference in participants' ability to accurately identify nude men versus clothed men, $t(27) = -1.96$, $p = .060$, [95% CI -0.040, 0.0005]. Participants were able to detect clothed men significantly more accurately than clothed women, $t(27) = 3.36$, $p = .002$, [95% CI 0.012, 0.045].

Condition	**Mean Target Accuracy [95% CI]**	**Median Saccadic Reaction Time (SRT) [95% CI]**
Nude women	90.5% [88.0% - 92.8%]	139.0 ms [133.5 - 158.0]
Nude men	89.7% [87.2% - 92.0%]	144.0 ms [137.0 - 156.0]
Clothed women	84.8% [82.3% - 87.1%]	146.5 ms [139.0 - 154.0]
Clothed men	87.7% [85.6% - 89.7%]	145.0 ms [137.0 - 154.0]

Table 2. Mean target accuracy and median saccadic reaction time (SRT) for each of the stimulus categories

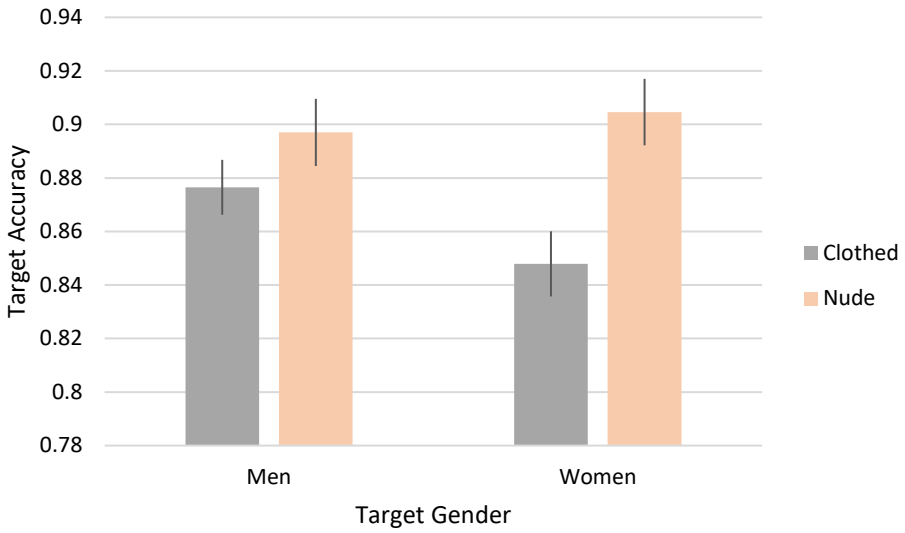

Figure 5. Mean target accuracy for each of the stimulus categories with standard error bars.

Effects of stimulus gender and sexual content on SRT

A repeated measures ANOVA was conducted to test the hypothesis that gynephilic men would be faster when initiating saccades toward nude women than clothed women, nude men, and clothed men (hypothesis 2; see Table 2 for descriptive statistics for median SRT). Contrary to my prediction, there were no significant main effects of stimulus gender, $F(1, 28) = 0.020$, $p = .89$, sexual content, $F(1, 28) = 0.177$, $p = .68$, $\eta_p^2 = .006$, $\eta_p^2 = .001$, or their interaction, $F(1, 28) = 1.21$, $p = .28$, $\eta_p^2 = .041$.

Sexual disgust and homonegativity predicting target accuracy and SRT toward nude men

A multiple linear regression was conducted to test the hypothesis that greater homonegativity and sexual disgust was associated with greater accuracy when identifying nude men (hypothesis 3). Contrary to my prediction, sexual disgust, homonegativity, and their interaction did not predict target accuracy toward nude men, Adjusted $R^2 = .074$, $F(3, 24) = 1.72$, $p = .19$. A multiple linear regression was also conducted to test the hypothesis that greater homonegativity and sexual disgust is associated with faster initiation of saccades toward nude

men (hypothesis 4). Contrary to my prediction, sexual disgust, homonegativity, and their interaction did not predict median SRT toward nude men, Adjusted R^2 = -.096, $F(3, 25) = 0.18$, $p = .91$.

Summary

These results suggest that gynephilic men were significantly more accurate when detecting nude women compared to clothed women and clothed men. Contrary to my hypothesis, however, there was no significant difference in gynephilic men's accuracy when detecting nude women versus nude men. Also contrary to my hypothesis, no significant differences in stimulus gender, sexual content, or their interaction were found when predicting median SRTs. This pattern of findings suggests that gynephilic men might not show gender-specific patterns of image detection accuracy or speed during the early perceptual analysis stage of sexual stimulus processing, as described by the IMM. The predicted effects of sexual disgust, homonegativity, and their interaction also were also not supported when predicting accuracy and speed of detection of nude men. Given that greater homonegativity in gynephilic men is associated with shorter sustained attention toward non-preferred sexual stimuli during later stages of stimulus processing (Tassone, Dawson, & Chivers, 2018), these null results suggest that the appraisal stage of stimulus detection may precede affective reactions. By this logic, it could be the case that gynephilic men with greater homonegativity do not avert their gaze from non-preferred sexual stimuli until feelings of negative affect are perceived and attributed to those stimuli. The broader significance of these findings is fully discussed in Chapter 4.

Chapter 3: Study 2

Although men's responses to sexual stimuli are typically characterized by their gender specificity (Chivers, 2010; Chivers, Seto, & Blanchard, 2007), Study 1 did not find evidence for gender-specific patterns of visual attention during the earliest stages of sexual stimulus detection. Following the initial stage of image appraisal, the IMM posits that subsequent stages of stimulus processing involve aversion-related and goal-directed inhibitory patterns that influence men's visual attention patterns and sexual responses. Study 2 (see Appendix E for GREB clearance letter) was designed to examine the cognitive processes that activate or inhibit sustained attention and genital responses to non-preferred sexual stimuli during later stages of sexual stimulus processing.

Research Aims and Hypotheses

Aims: 1) To examine the role of homonegativity and trait-level disgust (examples of aversion-related inhibitory traits) in predicting sustained attention toward images of non-preferred sexual targets, a measure of goal-directed inhibition. 2) To examine whether homonegativity and trait-level disgust negatively predict genital responses to non-preferred sexual targets. 3) To test the mediating role of sustained attention in the relationship between homonegativity and trait-level disgust when predicting genital responses to non-preferred sexual targets. 4) To test whether genital responses to non-preferred sexual targets predicts a subsequent reduction in sustained attention toward non-preferred targets.

Data were collected as part of a larger study that investigated the relationship between visual attention and genital responses to images of attractive and unattractive people. This paradigm facilitated the simultaneous measurement of sustained attention and penile tumescence. Participants also completed homonegativity and trait-level disgust measures following the

presentation of the stimuli. This paradigm explored the relationship between aversion-related inhibitory factors and goal-directed inhibitory factors that are thought to occur during later stages of sexual stimulus processing and subsequently affect genital responses.

Hypothesis 1: Homonegativity and trait-level disgust would be inversely related to the total amount of time gynephilic men spent looking at nude men.

Hypothesis 2: Homonegativity and trait-level disgust would be inversely related to the total amount of time gynephilic men spent looking at men's genital ROI, but not toward their face or chest ROIs.

Hypothesis 3: Homonegativity and trait-level disgust would be inversely related to pretrial to post-trial changes in penile tumescence while viewing slideshow presentations featuring nude men.

Hypothesis 4: The total amount of time gynephilic men spent looking at nude men would mediate the inverse relationship between homonegativity and trait-level disgust predicting changes in penile tumescence while viewing slideshow presentations featuring nude men (see Figure 6).

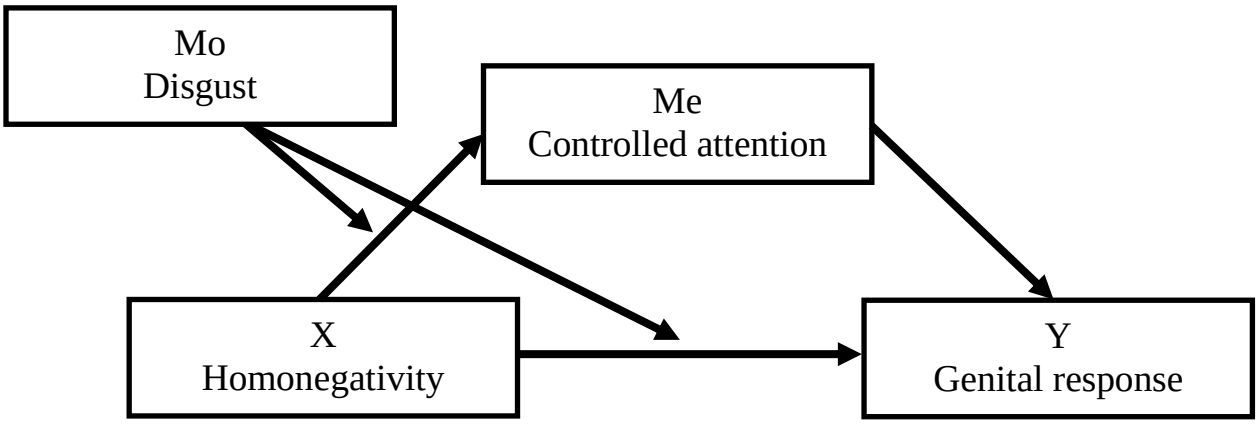

Figure 6. Mediated moderation regression model depicting the relationship between homonegativity (X), Disgust (Mo), controlled attention (Me), and genital response (Y) while viewing nude men.

Hypothesis 5: The total amount of time gynephilic men spent looking at nude men would be significantly greater in the time before they exhibited their peak penile response than after this response.

Method

Participants

Thirty-one predominantly and exclusively gynephilic men between ages 18 and 37 (M = 23.13) were recruited (see Table 3 for demographic characteristics). Using the previously described secondary data analyses (see p. 6), a priori power analysis indicated that this sample size would be sufficient to detect a significant linear relationship between homonegativity and controlled attention toward nude men (89% power). Participants had to be fluent in English, have normal or corrected to normal vision, have no difficulty attaining or keeping an erection for more than half the time during sexual activity, and be exclusively or predominantly sexually attracted to women in order to be eligible for the study.

	Study 2	
	N	%
Age (years)		
18-25	24	77.42%
26-35	6	19.35%
36-45	1	3.23%
46-55	0	0.00%
56-65	0	0.00%
Education (in progress or completed)		
High school	2	6.45%
Community college	1	3.23%
University	23	74.19%
Graduate degree	5	16.13%
Employment Status		
Employed, full-time	11	35.48%
Employed, part-time	4	12.90%
Full-time student	12	38.71%
Currently unemployed	4	12.90%
Relationship Status		
Single	13	41.94%
Dating	13	41.94%
Engaged	0	0.00%
Married	2	6.45%
Common law	2	6.45%
No response	1	3.23%
Race/Ethnicity		
White	18	58.06%
African	2	6.45%
Asian	8	25.81%
Hispanic	1	3.23%
2+ / Other	2	6.45%

Table 3. Demographic characteristics of Study 2 sample.

Measures and Apparatus

Questionnaires.

Sexual Attraction

The Kinsey Sexual Attraction Scale (KSAS; Kinsey, Pomeroy, & Martin, 1948; Appendix B) was administered to measure sexual orientation. All men reported that they had sexual attractions toward women mostly and men occasionally (n = 5), or toward women only (n= 26).

Sexual Identity

Participants could select more than one sexual identity descriptor, and most men identified as heterosexual (n = 28). Some men identified as bisexual (n = 1), queer (n = 1), or heterosexual and no label (n = 1).

Homonegativity

The homonegativity composite described in the secondary analyses was calculated to measure participants' sexual prejudice and aversion toward their homoerotic potential (see p. 6)[1]. The composite includes four items from the homoeroticism factor of the Sexual Opinion Survey with response options ranging from 1 to 7 (SOS; Fisher, White, Byrne, & Kelley, 1988; Appendix F) and two items from a novel measure of sexual attraction with responses ranging from 1 to 5 (Appendix G). In order to consolidate the discrepant range of values used in each scale, the composite was computed by standardizing each of the six items and calculating the mean of these z-scores for each participant. Higher scores indicate more negative attitudes

[1] Given that Study 2 uses data from a larger study for which data collection began before my MSc Proposal was approved, there are differences in the primary measures of homonegativity and disgust that are used in Study 1 and Study 2. These differences enable me to capture related but somewhat unique aspects of these constructs in each study.

toward same-sex sexual behaviour. This composite demonstrated sufficient internal reliability (Cronbach's $\alpha = .74$).

Analyses were also conducted using an alternative scoring method for the homonegativity composite. To calculate alternative homonegativity composite scores, participants` responses to the two novel items of sexual attraction were multiplied by 7/5 so that they were re-scaled onto the same 7-point scale that was used for the four SOS items. When analyses were re-run using this alternative scoring method, the pattern of results remained the same.

Trait-level Disgust

The Disgust Propensity and Sensitivity Scale-Revised (DPSS-R; Olatunji, Cisler, Deacon, Connolly, & Lohr, 2007; Appendix H) was administered to measure participants' trait-level disgust propensity (i.e., frequency of feeling disgust) and sensitivity (i.e., emotional impact of feeling disgust). The DPSS-R includes 16 items that ask participants about the frequency with which they experience disgust (e.g., "Disgusting things make my stomach turn") with response options ranging from 1 (never) to 5 (always). Participants' disgust propensity and sensitivity scores were determined by calculating each participants' mean score, with high scores indicating greater disgust responding. The scale was also found to have sufficient test-retest reliability (i.e., > .50; Olatunji, Cisler, Deacon, Connolly, & Lohr, 2007). In this sample, trait-level disgust items showed high internal consistency (Cronbach's $\alpha = .91$).

Visual Attention. Eye movements were measured with a Tobii T60 eye tracker and Tobii Studio software (Version 2.2; Tobii Technology, Stockholm, Sweden). The Tobii T60 is a contact-free, remote sensor eye-tracker.

Penile Tumescence. Men's genital responses were assessed using penile plethysmography (PPG), a mercury-in-rubber strain gauge that measures change in penile circumference (Cacioppo, Tassinary, & Berntson, 2017). Data were continuously recorded using an MP150 data-acquisition unit (BIOPAC Systems, Inc., Goleta, California) and AcqKnowledge software (Version 4.4, BIOPAC Systems, Inc., Goleta, California) at 1,000 Hz, low-pass filtered (.5 Hz), and digitized (40Hz). The gauge was calibrated through a 25mm range in 5mm steps (Janssen, 2002) after each session, and the penile plethysmograph signal was transformed into millimeters of circumference change from baseline.

Experimental Stimuli. Stimuli included thirty-two images of attractive nude men that were divided across two 96-second slideshows. Images were pseudo-randomly presented in one of the screen's four corners for 6s each, such that four images appeared in each of the four corners during each slideshow presentation.

Stimuli were pre-rated for physical attractiveness in a pilot validation study that was conducted in collaboration with Dr. Lisa DeBruine of the Institute of Neuroscience and Psychology at the University of Glasgow. Ninety-six participants (36 men, 60 women) aged 18 and above viewed 240 images of nude men and women (120 images each) and answered the following question, "Please evaluate the physical attractiveness of the individual in this image on a 1 to 7 scale (1 = not at all physically attractive; 2 = slightly physically attractive; 3 = somewhat physically attractive; 4 = moderately physically attractive; 5 = more than moderately physically attractive; 6 = very physically attractive; 7 = extremely physically attractive)". Thirty-two of the nude men that were rated the most attractive were selected for this study.

In addition to the slideshows with attractive men, participants viewed additional sets of stimuli. Overall, eight slideshows depicted sexual content and two depicted nonsexual content.

Procedure

Eligible participants completed the experiment in the Sexuality and Gender Lab. When potential participants arrived for their session, they received more information about the experiment by a trained Research Assistant and provided informed consent. Following the consent procedure, the experimenter left the room so that the participant could undress, position the strain gauge on their penis, and cover themselves with a sheet. Once the participant was covered, the experimenter calibrated the eye-tracker and administered a practice slideshow. The participant then answered questions about his current sexual arousal and affective state, viewed one of the experimental slideshows, and answered follow-up questions about his sexual arousal and affective state. This procedure (i.e., pre-stimulus questions, slideshow, post-stimulus questions) was repeated for each of the 10 experimental slideshows. After the participant completed this portion of the study, he removed the penile gauge, dressed, and met the experimenter in a separate testing room. In this room, the participant completed a questionnaire using a laptop, was debriefed about the purpose of the study, and given an opportunity to ask questions.

Data Preparation

Controlled attention. Fixation identification was calculated using the Tobii Fixation Filter, an algorithm that identifies fixations and removes saccadic movements. Total fixation duration represented the total amount of time (in seconds) that was spent looking at targets across each slideshow's 96s presentation window. Mean total fixation duration (total amount of time spent looking at a particular target) toward each man's body was calculated to represent controlled attention toward nude men. Total fixation duration has been used in affective neuroscience to measure controlled attention biases in processing stimuli that elicit strong

affective responses (Hermans, Vansteenwegen, & Eelen, 1999). For example, high trait anxious individuals spend less time looking toward angry faces than low trait anxious individuals (Rohner, 2002). Mean total fixation duration toward regions of interest (ROIs; i.e., face, chest, and genitals; Nummenmaa, Hietanen, Santtila, & Hyönä, 2012) were calculated to represent controlled attention toward specific areas of the male body.

Mean total fixation duration toward nude men before (i.e., "pre-peak") and after (i.e., "post-peak") each participant's peak genital response was calculated through a multi-step process. First, the image when each participant exhibited their peak genital response during each of the two slideshows was identified (i.e., "peak image"). Participants' total fixation duration toward nude men up to and including the peak image was then summed and divided by the time that had elapsed from the beginning of the slideshow. This calculation was completed for each of the two slideshows and averaged for each participant, resulting in the participants' pre-peak controlled attention toward nude men. To calculate the participants' mean post-peak controlled attention toward nude men, the participants' total fixation duration toward nude men following the peak image was summed and divided by the time elapsed from the peak image to the end of the slideshow. This calculation was completed for each of the two slideshows and then averaged for each participant, resulting in the participants' post-peak controlled attention toward nude men. If participants exhibited their peak genital response during the slideshow's final image, their visual attention data for this slideshow was not included in these calculations because there was no post-peak controlled attention data for comparison. Peak image frequency during one slideshow is summarized in Figure 7.

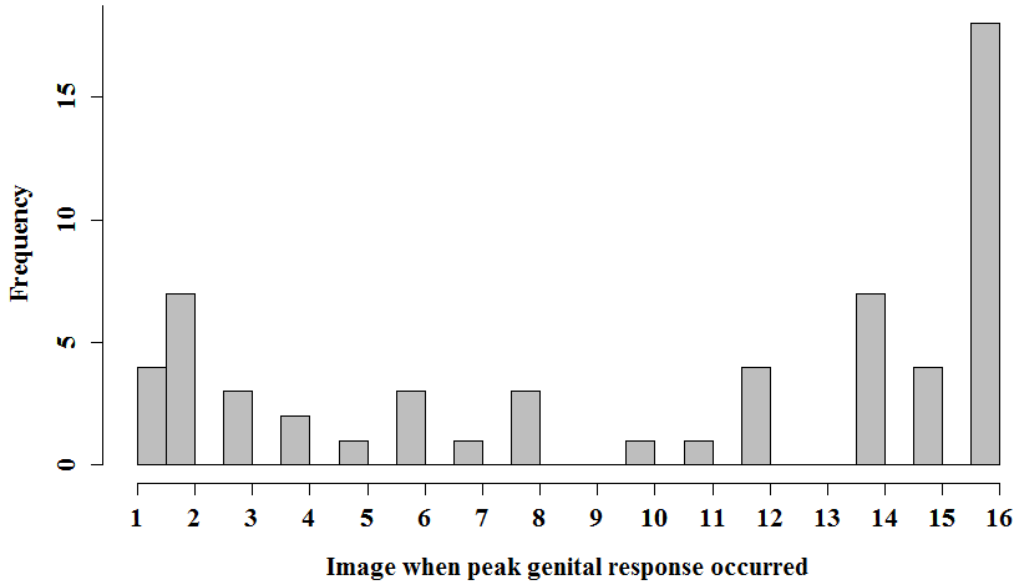

Figure 7. Occurrence of participants' peak penile response during one slideshow in Study 2, by image.

Genital response. Binary genital response (any detectable increase vs. no increase) was calculated by subtracting pretrial baseline genital response from the maximum genital response for each stimulus. Previous research has found that mercury-in-rubber strain gauges do not reliably measure changes in penile circumference until the 2.5mm threshold has been met (Kuban, Barbaree, & Blanchard, 1999). Participants with an increase in penile tumescence greater than 2.5mm to either slideshow featuring nude men were coded as showing a detectable increase in genital response.

To calculate genital response to nude men, pretrial to post-trial genital response change scores were standardized within-subjects (i.e., ipsatized; see Chivers, Seto, & Blanchard, 2007) and averaged across the two slideshows. All of the participants included in the genital response analyses showed at least a 2.5mm increase in maximum genital response and a 0.5 SD or greater increase in penile tumescence to any sexual stimulus, relative to their mean baseline response.

Skewness and kurtosis z-scores were calculated for controlled attention and genital response data and compared against the normal distribution (cutoff alpha level = .001). Controlled attention toward nude men was significantly negatively skewed and significantly leptokurtic; a reflect and square-root transformation was performed on this outcome variable. Because this transformation involves a reflection, interpretations of analyses involving controlled attention toward nude men should be reversed (Tabachnick & Fidell, 2012). Controlled attention toward nude men's face, chest, and genital ROIs were normally distributed. Standardized and unstandardized genital response scores were significantly positively skewed and significantly leptokurtic; a log transformation was performed on these outcome variables (Tabachnick & Fidell, 2012). Outliers for outcome variables were defined as values greater than 3.29 standard deviations from the mean (Tabachnick & Fidell, 2013). One outlier was identified and removed from the untransformed standardized genital response analyses. One participant's genital response data was not included in the analyses because the penile strain gauge malfunctioned during his session.

Statistical Analyses

Homonegativity and trait-level disgust were subject to a correlational analysis to examine whether the predictors represent discrete constructs or share a linear relationship. Homonegativity and trait-level disgust were each included in separate bootstrapped correlation analyses (5,000 iterations) with controlled attention toward nude men in order to test the size and direction of their linear relationships. To test the hypothesis that greater homonegativity and trait-level disgust negatively predicts controlled attention toward nude men (hypothesis 1), controlled attention toward nude men was subject to a multiple linear regression with homonegativity, trait-level disgust, and an interaction between the two terms as predictors.

Homonegativity and trait-level disgust were each included in separate bootstrapped correlation analyses (5,000 iterations) with controlled attention toward nude men's face, chest, and genital ROIs (i.e., six correlation analyses total) in order to test the size and direction of their linear relationships. To test the hypothesis that greater homonegativity and trait-level disgust negatively predicts controlled attention toward nude men's genital ROI, but not toward nude men's face or chest ROIs (hypothesis 2), controlled attention toward nude men's face, chest, and genital ROIs were each subject to a multiple linear regression with homonegativity, trait-level disgust, and their interaction as predictors.

To test whether participants showed a significant genital response to stimuli featuring nude men, participants' genital response to stimuli featuring nude men was compared to their genital response to neutral stimuli using a bootstrapped paired-samples t-test (5,000 iterations). Homonegativity and trait-level disgust were each included in separate bootstrapped correlation analyses (5,000 iterations) with genital response to nude men in order to test the size and direction of their linear relationships. To test the hypothesis that greater homonegativity and trait-level disgust negatively predicts genital response to nude men (hypothesis 3), participants' genital response was subject to a multiple linear regression with trait-level disgust, homonegativity, and their interaction as predictors. Participants' binary genital response to nude men (any detectable increase during either stimulus presentation (n = 18) vs. no detectable increase (n = 11)) was subject to a binary logistic regression, with homonegativity and trait-level disgust as the predictors.

A moderated mediation model in PROCESS (Model 8; Hayes, 2014) was used to test whether men's controlled attention toward nude men (Me) mediated the hypothesized inverse

relationship between homonegativity (X) and disgust (Mo) predicting genital response to nude men (Y; hypothesis 4; see Figure 6).

To test the hypothesis that controlled attention toward nude men will be significantly greater before participants exhibit their peak penile response compared to the time after this response (hypothesis 5), pre-peak and post-peak controlled attention toward nude men were subject to a bootstrapped paired-samples t-test (5,000 iterations). This analysis tests men's usage of a goal-directed inhibition strategy, attentional avoidance, in order to reduce their genital response to nude men.

Results

A correlational analysis was conducted to test whether homonegativity and trait-level disgust represent discrete constructs or share a linear relationship. Trait-level disgust (M = 2.33, SD = 0.67) and homonegativity (M = 0.002, SD = 0.65) had no statistically significant relationship, r = -.026, p = .89. Results suggest that they represent discrete constructs.

Homonegativity and trait-level disgust predicting controlled attention toward nude men stimuli

Homonegativity and trait-level disgust were entered into separate correlational analyses with controlled attention toward nude men to test the size and direction of their linear relationships. There was a significant inverse relationship between trait-level disgust and controlled attention toward nude men, r = -.41 [95% CI -.700, -.016] (see Table 4). There was no significant relationship between homonegativity and controlled attention toward nude men, r = -.11 [95% CI -.39, .13]. A multiple linear regression with homonegativity, trait-level disgust, and an interaction between the two terms predicting controlled attention toward nude men was conducted to test the hypothesis that greater homonegativity and trait-level disgust negatively predict controlled attention toward nude men (hypothesis 1). Together, trait-level disgust,

homonegativity, and their interaction predicted 17.9% of the variance in gynephilic men's controlled attention toward nude men, adjusted R^2 = .179, F (3, 27) = 3.19, p = .04 (see Table 5). The interaction between homonegativity and trait-level disgust significantly predicted controlled attention toward nude men, b = 1.48, t(27) = 2.21, p = .036. A simple slopes analysis was used to follow up the significant two-way interaction. At moderate (mean) and high homonegativity levels (+1 SD), participants with greater trait-level disgust spent significantly less time looking at nude men, b = 1.24, t(27) = 2.74, p = .010 and b = 2.21, t(27) = 3.02, p = .006, respectively. At lower homonegativity levels (-1 SD), trait-level disgust was not significantly related to controlled attention toward nude men, b = 0.28, t(27) = 0.55, p = .59 (See Figure 8)[2].

	Controlled attention, *r* [95% CI]				Genital response, *r* [95% CI]
Predictor	Full body	Face	Chest	Genitals	Men
Disgust	-.41* [-.70, -.02]	-.18 [-.58, .30]	-.24 [-.52, .13]	-.43* [-.68, -.15]	.23 [-.51, .62]
Homonegativity	-.11 [-.39, .13]	.20 [-.14, .50]	-.26 [-.58, .10]	.03 [-.32, .35]	-.20 [-.53, .20]

Note. Correlations computed using raw (i.e., untransformed) variables. * $p \leq .05$, ** $p \leq .01$

Table 4. Correlations between trait-level negative affect, visual attention toward nude men by region of male bodies, and genital response to stimuli featuring nude men.

	Controlled attention, *b* [95% CI]			
Predictor	Full body	Face	Chest	Genitals
Disgust	1.24* [0.31, 2.17]	-5.74 [-12.84, 1.37]	-1.38 [-3.72, 0.95]	-5.91* [-10.57, -1.26]
Homonegativity	0.34 [-0.56, 1.23]	3.06 [-3.78, 9.90]	-1.59 [-3.85, 0.66]	0.064 [-4.42, 4.55]
Disgust x Homonegativity	1.48* [0.10, 2.85]	-10.43 [-20.92, 0.07]	0.27 [-3.18, 3.72]	-2.64 [-9.52, 4.24]
Adjusted R^2	.18	.11	.03	.11
F	3.19*	2.18	1.31	2.28

Note. * $p \leq .05$, ** $p \leq .01$

Table 5. Linear regressions with disgust, homonegativity, and their interaction predicting visual attention toward nude men by region of male bodies.

[2] Linear regression analyses were re-run with untransformed controlled attention toward nude men as a predictor. The pattern of results remained the same, adjusted R^2 = .220, F(3, 27) = 3.82, p = .021 (all significant bs ≤ -0.36, ps ≤ .044).

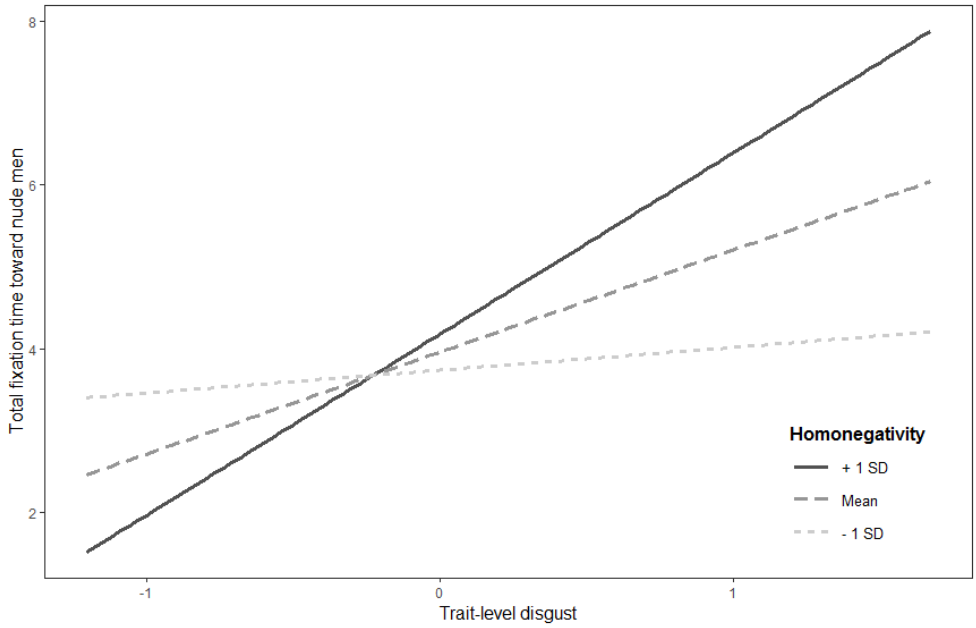

Figure 8. Simple slopes of trait-level disgust predicting total fixation time toward nude men (full body) for 1 SD below mean of homonegativity, mean of homonegativity, and 1 SD above mean of homonegativity. Interpretations of this figure should be reversed because a reflect and square-root transformation was conducted on the controlled attention outcome variable.

Homonegativity and trait-level disgust predicting controlled attention toward stimulus ROIs

Homonegativity and trait-level disgust were entered into separate correlational analyses with controlled attention toward nude men's face, chest, and genital ROIs (i.e., six correlations total) to test the size and direction of their linear relationships. There was a significant relationship between trait-level disgust and controlled attention toward nude men's genital ROI, such that participants with higher trait-level disgust spent less time looking at nude men's genitals, r = -.43 [95% CI -.68, -.15]. There was no significant relationship between trait-level disgust and controlled attention toward nude men' face ROI (r = -.18 [95% CI -.58, .30]) or chest ROI (r = -.24 [95% CI -.52, .13]). There was no significant relationship between homonegativity and controlled attention toward nude men's face (r = .20 [95% CI -.14, .50]), chest (r = -.26 [95% CI -.58, .10]), or genital (r = .030 [95% CI -.32, .35]) ROIs. Multiple linear regressions with homonegativity, trait-level disgust, and an interaction between the two terms predicting

controlled attention toward nude men's face, chest, and genital ROIs were conducted to test the hypothesis that greater homonegativity and trait-level disgust only negatively predicts controlled attention toward men's genital ROI (hypothesis 2). Contrary to my prediction, there was no significant relationship between these predictors and controlled attention toward men's genital ROI, Adjusted R^2 = .114, F (3, 27) = 2.28, p = .10. There was also no significant relationship between these predictors and controlled attention toward men's face and chest ROIs, Adjusted R^2 = .105, F (3, 27) = 2.18, p = .11 and Adjusted R^2 = .031, F (3, 27) = 1.31, p = .29.

Homonegativity and trait-level disgust predicting genital response to nude men

To test whether participants showed a significant genital response to stimuli featuring nude men, participants' genital response was compared to their genital response to neutral stimuli using a bootstrapped paired-samples t-test. Participants did not show a significant genital response to nude men, t(28) = 0.73, p = .47, 95% CI [-.10, .25]. Homonegativity and trait-level disgust were each included in separate bootstrapped correlation analyses with genital response to nude men in order to test the size and direction of their linear relationships. There was no significant relationship between trait-level disgust or homonegativity and genital response to nude men, r = .23 [95% CI -.51, .62] and r = -.20 [95% CI -.53, .20], respectively. A multiple linear regression with trait-level disgust, homonegativity, and their interaction predicting participants' genital response was conducted to test the hypothesis that greater homonegativity and trait-level disgust negatively predicts genital response to nude men (hypothesis 3). Together, trait-level disgust, homonegativity, and their interaction accounted for 18.5% of the variance in men's genital responses to nude men, Adjusted R^2 = .185, F(3, 26) = 3.19, p = .04 (see Table 6). The interaction between homonegativity and trait-level disgust significantly predicted genital response to nude men, b = -0.13, t(26) = -2.79, p = .01. A simple slopes analysis was used to

follow up the significant two-way interaction. At lower (-1 SD) and moderate (mean) levels of trait-level disgust, homonegativity was not significantly related to genital response to nude men, b = 0.04, $t(26)$ = 1.03, p = .31 and b = -0.04, $t(26)$ = 1.22, p = .23, respectively. At high levels of trait-level disgust (+1 SD), participants with greater homonegativity demonstrated significantly reduced genital responses to nude men, b = -0.12, $t(26)$ = -2.80, p = .010 (see Figure 9)[3].

Predictor	Genital response, *b* [95% CI]
Disgust	-0.006 [-0.07, 0.06]
Homonegativity	-0.041 [-0.10, 0.02]
Disgust x Homonegativity	-0.13** [-0.22, -0.03]
Adjusted R^2	.19
F	3.19*

Note. * $p \leq .05$, ** $p \leq .01$

Table 6. Linear regressions with disgust, homonegativity, and their interaction predicting genital response to stimuli featuring nude men.

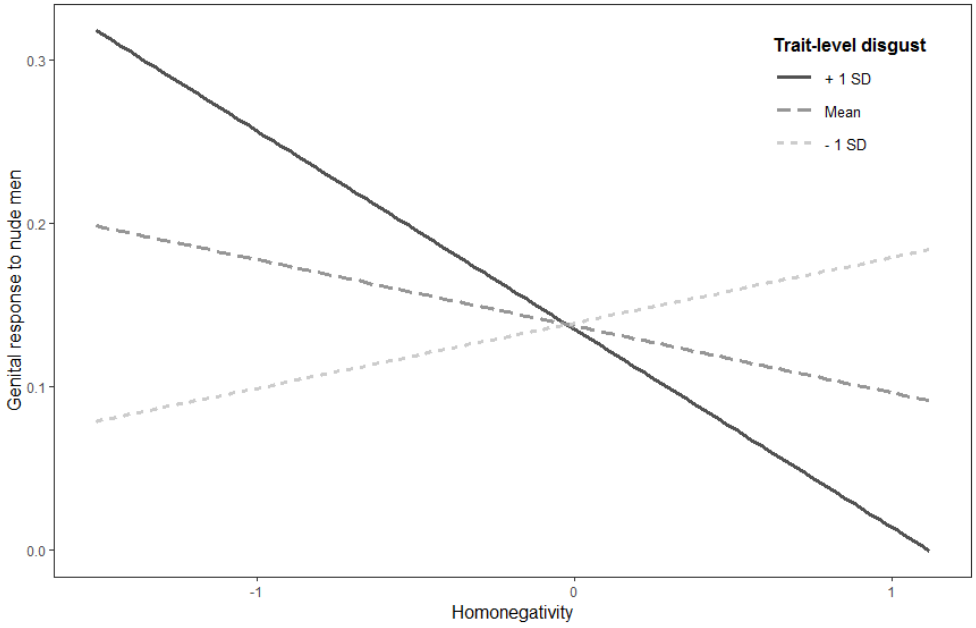

Figure 9. Simple slopes of homonegativity predicting genital response to attractive males for 1 SD below mean of trait-level disgust, mean of trait-level disgust, and 1 SD above mean of trait-level disgust.

[3] Linear regression analyses were re-run using untransformed standardized genital response scores, and one genital response outlier was removed. Trait-level disgust and homonegativity were not significantly associated with untransformed genital response, Adjusted R^2 = -0.07, $F(3, 25)$ = 0.39, p = .76.

Homonegativity, trait-level disgust, and their interaction were not significantly associated with raw (i.e., unstandardized) genital response, Adjusted R^2 = -0.05, $F(3, 26) = 0.50$, $p = .69$. A binary logistic regression was conducted to test whether homonegativity and trait-level disgust predicted the presence of any detectable genital response during either stimulus presentation with nude men. Homonegativity, trait-level disgust, and their interaction did not predict the presence of any detectable genital response to nude men, $\chi^2(3) = 2.70$, $p = .44$.

Controlled attention toward nude men as a mediator

A mediated moderation model was used to test whether men's controlled attention toward nude men (Me) mediates the interaction between homonegativity (X) and disgust (Mo) predicting genital response to nude men (Y; hypothesis 4; see Figure 6). Contrary to my hypothesis, controlled attention toward nude men did not mediate the relationship between homonegativity and trait-level disgust predicting genital response to nude men (indirect effect = -0.053; 95% CI [-.282, 0.053]). See Table 7 for all regression parameter estimates.

Variable (**Outcome in bold**)	*Est.*	*S.E.*	*t*	R^2	*F*
Controlled attention				0.32	2.96*
Homonegativity	-5.24	4.23	-1.24		
Disgust	-14.58	4.47	-3.26*		
Homonegativity x Disgust	-11.91	6.52	-1.83		
Genital response				0.32	2.96*
Controlled attention	0.004	0.01	0.86		
Homonegativity	-0.13	0.11	-1.13		
Disgust	0.11	0.14	0.78		
Homonegativity x Disgust	-0.43	0.18	-2.38*		

Note. S.E. = standard error; all estimates are unstandardized.
* $p \leq .05$, ** $p \leq .01$

Table 7. Regression parameter estimates of the mediated moderation model.

Differences in controlled attention toward nude men before and after peak genital response

A bootstrapped paired samples t-test was run to test gynephilic men's usage of a goal-directed inhibition strategy, attentional avoidance, to reduce their genital response to non-preferred sexual stimuli. Contrary to my prediction, there was no significant difference in controlled attention toward nude men before and after participants' peak genital response, $t(25) = 1.10$, $p = .28$, 95% CI [-.017, .057]. Visual attention data from 19 participants across 27 trials were included in a follow-up paired-samples t-test that only included trials when participants exhibited a detectable increase in penile tumescence (i.e., ≥ 2.5mm increase; Kuban, Barbaree, & Blanchard, 1999). In line with the previous results, there was no significant difference in controlled attention toward nude men before and after participants' peak genital response, $t(14) = -0.14$, $p = .89$, 95% CI [-0.088, 0.074].

A post-hoc bootstrapped paired samples t-test (5,000 iterations) was run to test whether gynephilic men used an alternative attentional avoidance strategy. I predicted that gynephilic men would attend to the nude men in the second slideshow for significantly less time than they did during first slideshow. Contrary to my post-hoc prediction, there was no significant difference in the amount of time gynephilic men spent looking at the first slideshow featuring nude men than the second slideshow that was presented, $t(27) = 0.13$, $p = .90$, 95% CI [-2.95, 3.58].

Summary

Findings from Study 2 suggest that homonegativity and trait-level disgust, examples of aversion-related inhibitory traits, play a significant role in gynephilic men's controlled attention toward nude men, a measure of goal-directed inhibition. The observed patterns suggest that, among gynephilic men who experience average and above-average levels of homonegativity,

greater trait-level disgust predicts less sustained attention toward nude men. Trait-level disgust, but not homonegativity, is also related to gynephilic men's controlled attention toward nude men's genitals, such that greater trait-level disgust predicts shorter sustained attention toward men's genitals. Homonegativity and trait-level disgust did not predict gynephilic men's controlled attention toward nude men's faces or chests. An interaction between homonegativity and trait-level disgust also predicted genital response to nude men; for men who experience a high trait-level disgust, greater homonegativity predicts lower genital responses to men. Taken together, these results suggest that gynephilic men's aversion-related inhibition predict greater usage of goal-directed inhibitory strategies (i.e., attentional avoidance) and lesser sexual responses, as measured by genital arousal. Contrary to my prediction, however, controlled attention toward nude men did not mediate the relationship between homonegativity and trait-level disgust predicting genital response to nude men. In addition, there was no significant difference in controlled attention toward nude men before and after participants' peak genital responses. Overall, these results demonstrate the influence of aversion-related inhibition on gynephilic men's visual attention patterns and genital arousal during later stages of sexual stimulus processing. The broader significance of these findings is discussed in Chapter 4.

Chapter 4: Discussion

Findings across both studies illustrate the attentional biases and trait-level affective reactions that influence gynephilic men's responses to non-preferred sexual stimuli. In Study 1, gynephilic men were significantly more accurate when detecting preferred sexual targets compared to both preferred and non-preferred clothed targets. Contrary to my prediction, however, there was no evidence that gynephilic men detect preferred sexual targets more accurately or faster than non-preferred sexual targets. Gynephilic men were actually *more* accurate when detecting clothed non-preferred targets over clothed preferred targets. Contrary to my hypothesis, trait-level sexual disgust sensitivity and homonegativity did not influence gynephilic men's accuracy or speed when detecting non-preferred sexual targets. Results suggest that trait-level sexual disgust sensitivity and homonegativity, examples of aversion-related inhibitory traits, are not associated with men's early detection of non-preferred sexual stimuli during the earliest stages of sexual stimulus processing.

During later stages of sexual stimulus processing, homonegativity and trait-level disgust played a significant role in predicting gynephilic men's controlled attention toward non-preferred sexual stimuli in Study 2. Among gynpehilic men who experienced average and above-average levels of homonegativity, greater trait-level disgust predicted shorter controlled attention toward non-preferred sexual stimuli. Trait-level disgust, but not homonegativity, was also related to gynephilic men's controlled attention toward non-preferred genitals, such that greater trait-level disgust predicted shorter attention toward men's genitalia. An interaction between homonegativity and trait-level disgust was also observed when predicting genital response to non-preferred sexual stimuli; for men who had a high trait-level disgust, greater homonegativity predicted lesser genital responses to non-preferred sexual stimuli. Contrary to my prediction,

however, controlled attention toward non-preferred sexual stimuli did not mediate the interaction between homonegativity and trait-level disgust when predicting genital response to non-preferred sexual stimuli. In addition, men's controlled attention toward non-preferred sexual stimuli did not differ in the time before they showed their peak genital response compared to the time after their peak response.

Evidence of nonexclusive patterns of response in gynephilic men

Further evidence of men's capacity for gender nonexclusive sexual response patterns was found across both studies. In Study 1, gynephilic men did not detect images of preferred sexual stimuli faster or more accurately than images of non-preferred sexual stimuli. This offers preliminary evidence that gynephilic men show gender-nonspecific patterns of initial attention at the very earliest stages of sexual response. Although Dawson and Chivers (2016) found that gynephilic men orient more quickly to preferred than non-preferred sexual stimuli, the latter study was likely assessing a later stage of sexual stimulus processing than Study 1. Dawson and Chivers (2016) displayed both examples of gendered stimuli simultaneously for 10 seconds each, which likely explains why participants' mean reaction time toward non-preferred sexual stimuli was much slower in the latter study than the present study (M = 1710ms versus M = 153ms). Taken together, results suggest that although gynephilic men show a gender-specific pattern of initial attention, this pattern of response is not present during earlier stages of stimulus detection. Evidence of gender specificity was not entirely absent from Study 1; participants detected preferred sexual stimuli significantly more accurately than images of clothed preferred and clothed non-preferred stimuli. Men's higher accuracy when detecting preferred sexual stimuli suggests that they may be biased to process sexually explicit images of their preferred gender

more efficiently than less sexually explicit images during the earliest stages of stimulus processing.

Study 2 also produced evidence for gynephilic men's capacity for nonexclusive sexual response patterns. Although the sexual stimuli used in Study 2 were less sexually potent than stimuli used in previous studies (a limitation described in more detail below), more than half of the sample of gynephilic men showed a detectable genital response during one or both of the nude male slideshows. Furthermore, some aversion-related inhibitory traits were found to influence the degree to which gynephilic men showed genital responses to non-preferred sexual stimuli, such that greater homonegativity predicted reduced genital responses in gynephilic men with high trait-level disgust. If interindividual variability in aversion-related inhibition predicts men's genital responses to sexual images of men, then gynephilic men's sexual behaviours may become increasingly malleable as society continues to become more accepting of same-sex sexuality (Movement Advancement Project, 2015).

Contributions to Current Models of Sexual Response

Study 1 was designed to explore attentional biases and affective mechanisms that impact gynephilic men's visual attention patterns during the earliest stages of sexual stimulus processing (i.e., automatic or pre-attentive visual processing of sexual cues). Our findings suggest that gynephilic men orient toward preferred and non-preferred sexual stimuli more accurately than nonsexual stimuli. This suggests that gynephilic men find it easier to filter out competing stimuli when a sexual stimulus is present. In the context of the IPM, this greater ability to filter out competing stimuli and accurately detect sexual targets means that sexual stimuli, whether they depict one's preferred or non-preferred gender, are more likely to attract gynephilic men's attention. Theoretically, in complex scenes that include nude and clothed people of all genders,

gynephilic men are significantly more likely to identify, appraise, and respond to the sexual stimuli of any gender in this scene.

The gender nonspecific patterns observed in Study 1 replicate previous reports of men's gender nonspecific responses during the earliest stages of sexual stimulus processing. In a study that examined gynephilic men's early cortical processing of sexual stimuli using EEG, Hietanen and Nummenmaa (2011) found that the latency of the peak amplitude for the occipitotemporal N170 component, a response that is sensitive to the perception of bodies, did not differ by sexual target gender. The average latency of the peak amplitude in response to nude stimuli was also identical to the mean SRT toward nude stimuli in the present study (M = 153ms). However, contrary to the present findings, Hietanen and Nummenmaa (2011) found that the N170's peak amplitude occurred significantly more quickly when men viewed women wearing swimsuits (M = 146ms). As in the present study, Nummenmaa, Hietanen, Santtila, and Hyönä (2012) also found that gender and sexual content did not predict gynephilic men's saccadic reaction time toward human targets presented in isolation. When Snowden & Gray (2013) used a modified version of the Implicit Association Test (IAT) to measure men's appraisal of gendered sexual stimuli, they found that gynephilic and androphilic men showed a pattern of sex-related appraisals that were in line with their sexual identity. In this study, men responded significantly faster when pairing images of their preferred gender with synonyms for "sexually attractive" and images of their non-preferred gender with synonyms for "sexually unattractive" than when they performed opposite image pairings. The stimuli used in this experiment only depicted heads and the fully-clothed torsos of men and women, however, and so it is unclear whether men's gender-specific pattern of response was sexually motivated.

Homonegativity and trait-level disgust did not predict gynephilic men's speed and accuracy when detecting non-preferred sexual stimuli in Study 1. Considering the rapid speed with which participants detected these stimuli, it is likely that image detection occurs on a timescale that precedes the influence of such affective processes. In the IMM, Toates (2009) proposes that the "early perceptual analysis" stage of sexual processing precedes and informs the stage of memory retrieval and cognitive processing. By this logic, there might not be enough time for men's negative affective responses to influence their visual attention at the very earliest stages of sexual response. The stimuli in this study were presented in blocked form, however, which made it possible for affective reactions to build over the course of an image block in each condition. For example, a man who is high in homonegativity may experience increases in negative affect over the course of the block of images with non-preferred sexual stimuli. Results suggest that if such effects did build over the course of the stimulus blocks, they may not have been strong enough to have a notable impact on speed or accuracy when detecting non-preferred sexual stimuli.

The affective and attentional mechanisms that impact gynephilic men's gender-specific patterns of visual attention and genital responses, which are observed during later stages of sexual stimulus processing and described in the IMM, were explored in Study 2. Findings illustrated how greater homonegativity and trait-level disgust, examples of aversion-related inhibitory traits, reduce gynephilic men's sustained attention toward non-preferred sexual stimuli. While the IMM's connection between aversive-related inhibitory reactions and avoidant attention toward non-preferred sexual stimuli is validated in Study 2, the precise moment when aversive-related inhibitory reactions influence conscious attentional processes remains unclear. Gynephilic men could look away from non-preferred sexual stimuli due to immediate feelings of negative affect that occur early in the processing of sexual stimuli, before a non-preferred target

has been fully appraised. It also possible, however, that gynephilic men only experience negative affective reactions during later stages of sexual stimulus processing, after the target has been fully appraised and the viewer has considered the potential consequences of looking too long (e.g., fear of others judging them, fear of orientation-incongruent arousal). Alternatively, as the IMM posits, gynephilic men's attentional avoidance of non-preferred sexual stimuli could be due to complementary processes that occur during early and later stages of sexual stimulus processing.

Study 2 also offers preliminary evidence that aversion-related inhibition influences gynephilic men's genital responses to non-preferred sexual stimuli. The association between aversion-related inhibitory traits and genital response supports the direct link from cognition/memory retrieval to arousal that Toates (2009) describes in the IMM. Given that Toates' model illustrates an interaction between goal-directed attentional avoidance and aversion-related inhibition in predicting sexual responses, it is surprising that gynephilic men's visual attention toward non-preferred sexual stimuli did not mediate the inverse moderated relationship between homonegativity, trait-level disgust, and genital response to non-preferred sexual stimuli. However, Toates' model does not outline the clean moderated mediation relationship that was hypothesized in this study; instead, he describes a complex network of competing processes that undergo arbitration before entering a bidirectional relationship with genital arousal. Although the existence of a moderated mediation relationship is possible in this context, it is more likely that the relationship between negative affective processes, controlled attention, and genital arousal is also influenced by additional factors, such as the context in which a sexual stimulus is viewed, or the presence of other people when a non-preferred sexual stimulus appears. Future work will need a much larger sample to accommodate statistical models

that can adequately untangle the numerous processes that influence gynephilic men's genital arousal.

Implications for gynephilic men's genital responses to non-preferred sexual stimuli

The present studies offer insight into the mechanisms that influence men's genital responses to non-preferred sexual stimuli. While a large body of work shows that men tend to show visual attention patterns, genital responses, and affective responses that are more gender-specific than androphilic women's sexual responses (Chivers, 2010; Chivers, Rieger, Latty, & Bailey, 2004; Chivers, Seto, & Blanchard, 2007), results from Study 1 suggest that men do not show gender-specific visual attention patterns during the earliest stages of sexual stimulus processing. The absence of gender-specific visual attention patterns during the earliest stages of sexual stimulus processing suggests that men's gender-specific visual attention patterns occur during later stages of stimulus processing.

Results from Study 2 suggest that variations in men's aversion-related inhibitory traits affect their attentional biases toward non-preferred sexual stimuli during later stages of stimulus processing, such that greater homonegativity and trait-level disgust interact to predict shorter controlled attention toward non-preferred stimuli. According to the observed interaction, however, men's aversion-related responses only influence their attentional patterns at moderate and high levels of homonegativity. Preliminary findings also suggest that men's aversion-related responses affect their genital responses to non-preferred sexual stimuli, and that this relationship is only observed at high levels of trait-level disgust.

Results from Study 1 and Study 2 suggest that the degree to which men show gender-specific sexual response patterns is partially determined by variations in aversion-related inhibitory traits that occur during later stages of sexual stimulus processing. In the context of the

IMM, findings from Study 2 draw a clear link between aversion-related inhibitory traits (via sensitivity to negative affective reactions) and goal-directed inhibition (via attentional avoidance). Study 2 also offers evidence that greater aversion-related inhibition predicts lower genital responding to non-preferred sexual stimuli. If aversion-related inhibitory traits predict gynephilic men's goal-directed inhibition and genital responses, then men's sexual responses may be partially moderated by social demands that influence their disgust sensitivity or homonegative biases.

Drawing from objectification theory (Fredrickson & Roberts, 1997), researchers have posited that androphilic women may show gender-nonspecific genital response patterns due to social influences. According to this hypothesis, the ubiquitous sexualization of women's bodies in popular media may have expanded androphilic women's cognitive networks to activate the sexual response system in response to non-preferred sexual stimuli (Chivers, 2017). Building upon this reasoning, Diamond (2017) notes that the present increased availability of eroticized images of men could lead to an increased prevalence of nonspecific sexual arousal patterns among gynephilic men. While Diamond's suggestion is concerned with *excitatory* factors of sexual response, and the present findings relate to *inhibitory* factors, both lines of reasoning suggest that future research should explore the malleability of men's sexual responses due to social change.

Limitations

Although these data contribute to our understanding of how men process and respond to non-preferred sexual stimuli, both samples' demographic characteristics may have skewed the results. Data were collected in a small Canadian university city in 2017 & 2018, and white educated young adults were overrepresented in both samples. Considering the documented

differences between members of WEIRD (Western, Educated, Industrialized, Rich, and Democratic) societies and other cultural groups (Henrich, Heine, & Norenzayan, 2010), the significant decrease in anti-gay biases among white educated samples (Lambert, Ventura, Hall, & Cluse-Tolar, 2006; Lewis, 2003), and Canada's status as a global leader in LGBTQ civil rights (CBC News, 2015), one might expect that my sample holds weaker homophobic beliefs than most adults in North America. Despite this expectation, however, my sample's mean score on the MMSP's "Resist Heteronormativity" subscale does not differ from the mean score of a sample collected in central Texas (M = 2.06 vs. M = 2.13, respectively; Massey, 2009)[4]. Dawson, Huberman, Bouchard, McInnis, Pukall, & Chivers (in press) have also found that volunteers for eye tracking and psychophysiology studies report being more sexually liberal and more likely to experience some degree of same-gender attraction. Despite the overwhelming evidence that my sample overrepresents men who experience lower levels of homonegativity and more same-sex sexual attractions, however, homonegativity and trait-level disgust were still found to predict controlled attention and genital response to non-preferred sexual stimuli. Considering the present findings, the influence of homonegativity and disgust on visual attention and genital response to non-preferred sexual stimuli is likely to be much *stronger* in samples that are more representative of the general population.

Results from Study 1 did not show a difference in saccadic reaction times across stimulus gender and sexual content categories. Previous work from Crouzet, Kirchner, and Thorpe (2010) suggests that faces may fall in a special category of recognition that triggers faster saccades than other evolutionarily-relevant classes of stimuli (e.g., animals). Given that all of the targets' faces were visible in the present study, it is possible that effects of stimulus gender and sexual content

[4] "Resist Heteronormativity" scores were re-coded so that high scores indicated stronger discomfort with assigned sex and gender roles and expectations to facilitate comparability with the mean scores reported in Massey (2009).

were washed out by this ability to detect faces faster any other stimulus category. In support of this explanation, the mean SRT across all categories in the present study is very close to the mean SRT for face targets in Crouzet, Kirchner, & Thorpe's (2010) study (153.87ms vs. 147ms, respectively). Furthermore, in an investigation of how men and women visually inspect nude bodies, Nummenmaa, Hietanen, Santtila, & Hyönä (2012) found that participants' first fixations nearly always landed on the facial region. Future work would benefit from obscuring targets' facial features in order to isolate the effects of primary and secondary sex characteristics on gynephilic men's speed and accuracy when detecting gendered sexual stimuli.

The costs and benefits of using static images of non-preferred sexual stimuli in Study 2 should be considered when interpreting these findings. While disgust and homophobia have been tied to conscious and unconscious antigay biases in previous research (Inbar, Pizarro, Knobe, & Bloom, 2009; Mahaffey, Bryan, & Hutchison, 2005), the present work suggests that these affective responses continue to influence visual attention toward non-preferred sexual stimuli outside of an explicitly gay context. Results suggest that the mere image of a nude man can elicit disgust, spark feelings of antigay sentiments, and subsequently motivate attentional avoidance. However the use of decontextualized images might also suppress the inverse relationship between homonegativity and visual attention toward non-preferred sexual stimuli that is observed in explicitly gay contexts. Tassone, Dawson, and Chivers (2018) found that homonegativity was the sole predictor of attentional avoidance of non-preferred sexual stimuli. It is worth noting that the latter study's stimuli included dynamic sexual media that was created for androphilic men. It is possible that homonegativity is a stronger predictor of controlled attention toward non-preferred sexual stimuli depending on the modality and potency of the stimuli. Previous research also suggests that dynamic audio-visual sexual stimuli results in greater genital

arousal than static stimuli (Sakheim, Barlow, Beck, & Abrahamson, 1985); this might explain why the present study did not find significant increases in penile tumescence during static stimuli while previous work found significant increases during dynamic stimuli presentations (Chivers, Seto, & Blanchard, 2007). The use of static sexual stimuli might have limited participants' genital responses and reduced genital response variability within the sample.

While findings from the present studies offer insight into the inhibitory mechanisms that contribute to men's gender-specific sexual response patterns, this knowledge is limited to our understanding of gynephilic men's sexual responses. Similar to gynephilic men, androphilic men also show variability in their genital response to non-preferred sexual stimuli (Chivers, Rieger, Latty, & Bailey, 2004), and their attractions show a capacity for change over time (Diamond, 2016; Diamond, Dickenson, & Blair, 2017). Yet, despite a common trope in popular media that androphilic men are disgusted by women's genitals (Michelson, 2016; Thornton, 2014), empirical evidence that supports or contradicts this pattern is scarce. In an early study of this hypothesis, Freund, Langevin, Cibiri, and Zajac (1973) found that androphilic men did not express disgust toward sexual images of their non-preferred gender (unlike their gynephilic counterparts). Empirical research on the prevalence of "heterophobia" (i.e., an aversion to heterosexual people (Merriam-Webster.com Dictionary)) within androphilic communities is also lacking. Given that members of the LGBTQ community face considerable discrimination and negative stigma due to their sexual orientation (Movement Advancement Project, 2015), the social consequences for straight-identified men who report same-sex sexual attractions are undoubtedly greater than they would be for gay-identified men who report sexual attractions to women. This discrepancy could mean that the relationship between aversive-related inhibitory responses and attentional avoidance is unique to gynephilic men. Future work should investigate

whether androphilic men experience significant feelings of disgust or heterophobia upon viewing non-preferred sexual stimuli. If this relationship exists, then Study 2 should be replicated with an androphilic sample to explore whether feelings of disgust or heterophobia influence androphilic men's controlled attention and genital responses to non-preferred sexual stimuli.

Conclusions

In order to understand the processes that underlie gynephilic men's capacity for nonexclusive sexual attractions, two studies explored how gynephilic men process and respond to non-preferred sexual stimuli. Results from Study 1 suggest that, at the earliest stages of sexual response, gynephilic men can accurately detect images of preferred sexual stimuli faster than clothed men and women. However, their speed and accuracy when detecting preferred versus non-preferred *sexual* stimuli did not differ significantly, suggesting that men may only show gendered patterns of sexual arousal during later stages of sexual stimulus processing. Study 2 explored several mechanisms that might influence men's gender-specific responding during later stages of stimulus processing, namely aversion-related inhibition and goal-directed inhibition. Results found that greater levels of homonegativity and trait-level disgust (i.e., aversion-related inhibition) predicted attentional avoidance (i.e., goal-directed inhibition) of non-preferred sexual stimuli. Greater homonegativity and disgust also predicted lower genital response to non-preferred sexual stimuli. Controlled attention toward nude men did not, however, mediate the relationship between homonegativity and trait-level disgust predicting genital response to non-preferred sexual stimuli. Future work should explore whether greater acceptance of LGBTQ populations on a societal level reduces the prevalence of gynephilic men's inhibitory strategies when viewing non-preferred sexual stimuli.

References

Adams, H. E., Wright, L. W., & Lohr, B. A. (1996). Is homophobia associated with homosexual arousal? *Journal of Abnormal Psychology, 105*(3), 440-445.

Armstrong, T., & Olatunji, B. O. (2012). Eye tracking of attention in the affective disorders: A meta-analytic review and synthesis. *Clinical Psychology Review, 32*(8), 704-723. https://doi.org/10.1016/j.cpr.2012.09.004

Bailey, J. M. (2009). What is sexual orientation and do women have one?. in D. A. Hope (Ed.), *Contemporary perspectives on lesbian, gay, and bisexual identities* (pp. 183–195). https://doi.org/10.1007/978-0-387-09556-1

Bailey, J. M., Dunne, M. P., & Martin, N. G. (2000). Genetic and environmental influences on sexual orientation and its correlates in an Australian twin sample. *Journal of Personality and Social Psychology, 78*(3), 524–536. https://doi.org/10.1037/0022-3514.78.3.524

Barlow, D. H., Becker, R., Leitenberg, H., & Agras, W. S. (1970). A mechanical strain gauge for recording penile circumference change. *Journal of Applied Behavior Analysis, 3*(1), 73-76.

Baumeister, R. F. (2000). Gender differences in erotic plasticity: The female sex drive as socially flexible and responsive. *Psychological Bulletin, 126*(3), 347–374. https://doi.org/10.1037/0033-2909.126.3.347

Billingsley, J., Lieberman, D., & Tybur, J. M. (2018). Sexual Disgust Trumps Pathogen Disgust in Predicting Voter Behavior During the 2016 US Presidential Election. *Evolutionary Psychology, 16*(2), 1474704918764170.

Cacioppo, J. T., Tassinary, L. G., & Berntson, G. G. (Eds.). (2017). *Handbook of Psychophysiology*. Cambridge, UK: Cambridge University Press.

CBC News (2015, May 25). TIMELINE: Same-sex rights in Canada. *Canadian Broadcasting Corporation (CBC) News*. Retrieved from http://www.cbc.ca

Chivers, M. L. (2010). A brief update on the specificity of sexual arousal. *Sexual and Relationship Therapy, 25*(4), 407–414. https://doi.org/10.1080/14681994.2010.495979

Chivers, M. L. (2017). The specificity of women's sexual response and its relationship with sexual orientations: A review and ten hypotheses. Archives of Sexual Behavior, 46(5), 1161-1179. https://doi.org/10.1007/s10508-016-0897-x

Chivers, M. L., & Bailey, J. M. (2005). A sex difference in features that elicit genital response. *Biological Psychology, 70*(2), 115–120. https://doi.org/10.1016/j.biopsycho.2004.12.002

Chivers, M. L., Rieger, G., Latty, E., & Bailey, J. M. (2004). A sex difference in the specificity of sexual arousal. *Psychological Science, 15*(11), 736–744. https://doi.org/10.1111/j.0956-7976.2004.00750.x

Chivers, M. L., Seto, M. C., & Blanchard, R. (2007). Gender and sexual orientation differences in sexual response to sexual activities versus gender of actors in sexual films. *Journal of Personality and Social Psychology, 93*(6), 1108-1121. http://dx.doi.org/10.1037/0022-3514.93.6.1108

Crouzet, S. M., Joubert, O. R., Thorpe, S. J., & Fabre-Thorpe, M. (2012). Animal detection precedes access to scene category. *PLoS ONE, 7*(12), 1–9. https://doi.org/10.1371/journal.pone.0051471

Crouzet, S. M., Kirchner, H., & Thorpe, S. J. (2010). Fast saccades toward faces: Face detection in just 100 ms. *Journal of Vision, 10*(4), 1–17. https://doi.org/10.1167/10.4.16

Dawson, S. J., & Chivers, M. L. (2016). Gender-specificity of initial and controlled visual attention to sexual stimuli in androphilic women and gynephilic men. *PLoS ONE, 11*(4), 1–22. https://doi.org/10.1371/journal.pone.0152785

Dawson, S. J., Huberman, J., Bouchard, K., McInnis, M., Pukall, C., & Chivers, M. L. (in press). Effects of Gender and Sexual Orientation on Volunteer Bias in Sexuality Research. *Archives of Sexual Behaviour*.

Diamond, M. (1993). Homosexuality and bisexuality in different populations. *Archives of Sexual Behavior, 22*(4), 291–310. https://doi.org/10.1007/BF01542119

Diamond, L. M. (2003). What does sexual orientation orient? A biobehavioral model distinguishing romantic love and sexual desire. *Psychological Review, 110*(1), 173-192. https://doi.org/10.1037/0033-295X.110.1.173

Diamond, L. M. (2016). Sexual fluidity in male and females. *Current Sexual Health Reports, 8*(4), 249–256. https://doi.org/10.1007/s11930-016-0092-z

Diamond, L. M. (2017). Wanting women: Sex, gender, and the specificity of sexual arousal. *Archives of Sexual Behavior, 46*(5), 1181-1185.

Diamond, L. M., Dickenson, J. A., & Blair, K. L. (2017). Stability of sexual attractions across different timescales: The roles of bisexuality and gender. *Archives of Sexual Behavior, 46*(1), 193-204. https://doi.org/10.1007/s10508-016-0860-x

Fisher, W. A., White, L. A., Byrne, D., & Kelley, K. (1988). Erotophobia-erotophilia as a dimension of personality. *Journal of Sex Research, 25*(1), 123-151. Retrieved from http://www.tandfonline.com/doi/abs/10.1080/00224498809551448

Fredrickson, B. L., & Roberst, T.-A. (1997). Objectification theory: Toward understanding women's live experiences and mental health risks. *Psychology of Women Quarterly, 21*, 173–206. doi: 10.1111/j.1471-6402.1997.tb00108.x

Freund, K., Langevin, R., Cibiri, S., & Zajac, Y. (1973). Heterosexual aversion in homosexual males. *British Journal of Psychiatry, 122*, 163–169.

Grey, J. A., Robinson, B. B. E., Coleman, E., & Bockting, W. O. (2013). A systematic review of instruments that measure attitudes toward homosexual men. *Journal of Sex Research, 50*(3–4), 329–52. https://doi.org/10.1080/00224499.2012.746279

Henrich, J., Heine, S. J., and Norenzayan, A. (2010). The Weirdest People in the World? *Behavioral and Brain Sciences, 33*(2-3), 61–83. http://dx.doi.org/10.1017/S0140525X0999152X

Hermans, D., Vansteenwegen, D., & Eelen, P. (1999). Eye movement registration as a continuous index of attention deployment: Data from a group of spider anxious students. *Cognition & Emotion, 13*(4), 419-434.

Heterophobia. In *Merriam-Webster.com Dictionary*. Retrieved from https://www.merriam-webster.com/dictionary/heterophobia

Hietanen, J. K., & Nummenmaa, L. (2011). The naked truth: the face and body sensitive N170 response is enhanced for nude bodies. *PLoS One, 6*(11), 1-12. https://doi.org/10.1371/journal.pone.0024408

Inbar, Y., Pizarro, D. A., Knobe, J., & Bloom, P. (2009). Disgust sensitivity predicts intuitive disapproval of gays. *Emotion, 9*(3), 435–439. https://doi.org/10.1037/a0015960

Israel, E., & Strassberg, D. S. (2009). Viewing time as an objective measure of sexual interest in heterosexual men and women. *Archives of Sexual Behavior, 38*(4), 551–558. https://doi.org/10.1007/s10508-007-9246-4

Janssen, E. (2002). Psychophysiological measurement of sexual arousal. In M. W. Wiederman & B. E. Whitley (Eds.), *Handbook for conducting research on human sexuality* (pp. 139-171). Mahwah, NJ: Erlbaum.

Janssen, E., Everaerd, W., Spiering, M., & Janssen, J. (2000). Automatic processes and the appraisal of sexual stimuli: Toward an information processing model of sexual arousal. *Journal of Sex Research, 37*(1), 8–23. https://doi.org/10.1080/00224490009552016

Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male.* Bloomington, IN: Indiana University Press.

Kuban, M., Barbaree, H. E., & Blanchard, R. (1999). A comparison of volume and circumference phallometry: Response magnitude and method agreement. *Archives of Sexual Behavior, 28*(4), 345–359. https://doi.org/10.1023/A:1018700813140

Lambert, E. G., Ventura, L. A., Hall, D. E., & Cluse-Tolar, T. (2006). College students' views on gay and lesbian issues: Does education make a difference? *Journal of Homosexuality, 50*(4), 1-30. https://doi.org/10.1300/J082v50n04_01

Lewis, G. B. (2003). Black-white differences in attitudes toward homosexuality and gay rights. *Public Opinion Quarterly, 67*(1), 59-78. https://doi.org/10.1086/346009

Mahaffey, A. L., Bryan, A., & Hutchison, K. E. (2005). Sex differences in affective responses to homoerotic stimuli: Evidence for an unconscious bias among heterosexual men, but not heterosexual women. *Archives of Sexual Behavior, 34*(5), 537–545. https://doi.org/10.1007/s10508-005-6279-4

Massey, S. G. (2009). Polymorphous prejudice: Liberating the measurement of heterosexuals' attitudes toward lesbians and gay men. *Journal of Homosexuality, 56*(2), 147–172. https://doi.org/10.1080/00918360802623131

McCabe, J., Brewster, K. L., & Tillman, K. H. (2011). Patterns and correlates of same-sex sexual activity among U.S. teenagers and young adults. *Perspectives on Sexual and Reproductive Health, 43*(3), 142–150. https://doi.org/10.1363/4314211

Michelson, N. (2016). Here's what happened when these gay men touched a vagina for the first time. *Huffington Post – Queer Voices*. Retrieved July 3, 2018, from https://www.huffingtonpost.ca/entry/these-gay-men-touch-a-vagina-for-the-first-time_us_569e4caee4b0cd99679b4e0b

Movement Advancement Project. (2015). *The momentum report – 2014 edition: A snapshot of progress and setbacks for LGBT equality.* Retrieved from Momentum Advancement Project website: http://www.lgbtmap.org/file/2014-momentum-report.pdf

Mustanski, B., Birkett, M., Greene, G. J., Rosario, M., Bostwick, W., & Everett, B. G. (2014). The association between sexual orientation identity and behavior across race/ethnicity, sex, and age in a probability sample of high school students. *American Journal of Public Health, 104*(2), 237–244. https://doi.org/10.2105/AJPH.2013.301451

Nummenmaa, L., Hietanen, J. K., Santtila, P., & Hyönä, J. (2012). Gender and visibility of sexual cues influence eye movements while viewing faces and bodies. *Archives of Sexual Behavior, 41*(6), 1439–1451. https://doi.org/10.1007/s10508-012-9911-0

Olatunji, B. O., Cisler, J. M., Deacon, B. J., Connolly, K., & Lohr, J. M. (2007). The Disgust Propensity and Sensitivity Scale-Revised: Psychometric properties and specificity in

relation to anxiety disorder symptoms. *Journal of Anxiety Disorders, 21*(7), 918–930. https://doi.org/10.1016/j.janxdis.2006.12.005

Rieger, G., Chivers, M. L., & Bailey, J. M. (2005). Sexual arousal patterns of bisexual men. *Psychological Science, 16*(8). https://doi.org/10.1111/j.1467-9280.2005.01578.x

Rohner, J. C. (2002). The time-course of visual threat processing: High trait anxious individuals eventually avert their gaze from angry faces. *Cognition & Emotion, 16*(6), 837-844.

Sakheim, D. K., Barlow, D. H., Beck, J. G., & Abrahamson, D. J. (1985). A comparison of male heterosexual and male homosexual patterns of sexual arousal. *Journal of Sex Research,21*, 183–198.

Samson, L., & Janssen, E. (2014). Sexual and affective responses to same-and opposite-sex stimuli in heterosexual and homosexual men: Assessment and manipulation of visual attention. *Archives of Sexual Behavior, 43*(5), 917–930. https://doi.org/10.1007/s10508-013-0221-y

Savin-Williams, R. C., Joyner, K., & Rieger, G. (2012). Prevalence and stability of self-reported sexual orientation identity during young adulthood. *Archives of Sexual Behavior, 41*(1), 103–110. https://doi.org/10.1007/s10508-012-9913-y

Seto, M. C., Adkerson, D. L., Hindman, J., Jensen, S. H., Peters, J. M., & Peterson, K. D. (2001). *Practice standards and guidelines for members of the association for the treatment of sexual abusers* (3rd ed.). Beaverton, OR: Association for the Treatment of Sexual Abusers.

Silva, T. J. (2015). 'Helpin' a buddy out': Perceptions of identity and behaviour among rural straight men that have sex with each other. *Sexualities*. Advance online publication. https://doi.org/10.1177/1363460716678564

Snowden, R. J., & Gray, N. S. (2013). Implicit sexual associations in heterosexual and homosexual women and men. *Archives of Sexual Behavior, 42*(3), 475-485. https://doi.org/10.1007/s10508-012-9920-z

Tabachnick, B. G., & Fidell, L. S. (2012). Using multivariate statistics (6th ed.). New York City, NY: Pearson Education.

Tassone, D., Dawson, S. J., and Chivers, M. L. (2018). *Homonegativity as a predictor of gynephilic men's controlled attention and attraction toward non-preferred sexual images and video.* Manuscript in preparation.

Thornton, K. (2014). Vaginas aren't gross. But here's my theory about why some gay men say they are. *Huffington Post – The Blog*. Retrieved July 3, 2018, from https://www.huffingtonpost.com/kevin-thornton/vaginas-arent-gross_b_6298116.html

Toates, F. (2009). An integrative theoretical framework for understanding sexual motivation, arousal, and behavior. *Journal of Sex Research, 46*(2–3), 168–193. https://doi.org/10.1080/00224490902747768

Tybur, J. M., Lieberman, D., & Griskevicius, V. (2009). Microbes, mating, and morality: Individual differences in three functional domains of disgust. *Journal of Personality and Social Psychology, 97*(1), 103–122. https://doi.org/10.1037/a0015474

Vrangalova, Z., & Savin-Williams, R. C. (2010). Correlates of same-sex sexuality in heterosexually identified young adults. *Journal of Sex Research, 47*(1), 92–102. https://doi.org/10.1080/00224490902954307

Ward, J. (2015). *Not gay: Sex between straight white men*. New York, NY: New York University Press.

Zald, D. H. (2003). The human amygdala and the emotional evaluation of sensory stimuli. *Brain Research Reviews, 41*(1), 88–123. https://doi.org/10.1016/S0165-0173(02)00248-5

Appendix A: Study 1 GREB clearance letter

Queen's University

August 09, 2017

Mr. Daniel Tassone
Master's Student
Queen's University
Kingston, ON, K7L 3N6

GREB Ref #: GPSYC-814-17; TRAQ # 6021344
Title: "GPSYC-814-17 Saccades Toward Sexual Stimuli in Women and Men"

Dear Mr. Tassone:

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled **"GPSYC-814-17 Saccades Toward Sexual Stimuli in Women and Men"** for ethical compliance with the Tri-Council Guidelines (TCPS 2 (2014)) and Queen's ethics policies. In accordance with the Tri-Council Guidelines (Article 6.14) and Standard Operating Procedures (405.001), your project has been cleared for one year. You are reminded of your obligation to submit an annual renewal form prior to the annual renewal due date (access this form at http://www.queensu.ca/traq/signon.html/; click on "Events"; under "Create New Event" click on "General Research Ethics Board Annual Renewal/Closure Form for Cleared Studies"). Please note that when your research project is completed, you need to submit an Annual Renewal/Closure Form in Romeo/traq indicating that the project is 'completed' so that the file can be closed. This should be submitted at the time of completion; there is no need to wait until the annual renewal due date.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one year period (access this form at http://www.queensu.ca/traq/signon.html/; click on "Events"; under "Create New Event" click on "General Research Ethics Board Adverse Event Form"). An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example, you must report changes to the level of risk, applicant characteristics, and implementation of new procedures. To submit an amendment form, access the application by at http://www.queensu.ca/traq/signon.html; click on "Events"; under "Create New Event" click on "General Research Ethics Board Request for the Amendment of Approved Studies". Once submitted, these changes will automatically be sent to the Ethics Coordinator, Ms. Gail Irving, at the Office of Research Services for further review and clearance by the GREB or GREB Chair.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Sincerely,

Joan Stevenson, Ph.D.
Interim Chair
General Research Ethics Board

c: Dr. Daryl Wilson, Supervisor
Ms. Samantha Dawson, Mr. Geoff Harrison, Dr. Daryl Wilson, Co-investigators
Dr. Leandre Fabrigar, Chair, Unit REB

Appendix B. Kinsey Sexual Attraction Scale (KSAS)

Please think about the people you have typically been sexually attracted to. By "sexually" attracted we mean you experience sexual desire or interest in someone. Would you say that your sexual attractions are toward:

- Women only
- Women mostly, but men occasionally too
- Women mostly, but men frequently (but not more than toward women)
- Women and men about equally
- Men mostly, but women frequently (but not more than toward men)
- Men mostly, but women occasionally too
- Men only

Appendix C. Multidimensional Measure of Sexual Prejudice (MMSP) - `Resist Heteronormativity Subscale`

	Totally disagree				Totally agree
I feel restricted by the gender label that people attach to me.	1	2	3	4	5
I feel restricted by the sexual label that people attach to me.	1	2	3	4	5
I feel limited by the sexual behaviours that are expected of me.	1	2	3	4	5
I feel restricted by the sexual rules and norms of society.	1	2	3	4	5
I feel restricted by the expectations people have of me because of my gender.	1	2	3	4	5
I worry about the privileges I get from society because of my sexual orientation.	1	2	3	4	5
It seems to me that the labels "man" and "woman" aren't really very useful ways to describe the differences between people.	1	2	3	4	5
I believe that most people are basically bisexual.	1	2	3	4	5

Appendix D. Three Domains of Disgust Scale (TDDS) – Sexual Disgust subscale

	Not at all disgusting						Extremely disgusting
Hearing two strangers having sex	1	2	3	4	5	6	7
Performing oral sex	1	2	3	4	5	6	7
Watching a pornographic video	1	2	3	4	5	6	7
Finding out that someone you don't like has sexual fantasies about you	1	2	3	4	5	6	7
Bringing someone you just met back to your room to have sex	1	2	3	4	5	6	7
A stranger of the opposite sex intentionally rubbing your thigh in an elevator	1	2	3	4	5	6	7
Having anal sex with someone of the opposite sex	1	2	3	4	5	6	7

Appendix E. Study 2 GREB clearance letter

QUEEN'S UNIVERSITY HEALTH SCIENCES & AFFILIATED TEACHING HOSPITALS RESEARCH ETHICS BOARD (HSREB)

HSREB Initial Ethics Clearance

April 06, 2016

Ms. Amanda Timmers
Department of Psychology
Queen's University

ROMEO/TRAQ: #6017909
Department Code: PSYC-172-16
Study Title: Psychophysiological assessment of sexual responses and eye movements to sexual images
Co-Investigators: Dr. M. Chivers
Review Type: Delegated
Date Ethics Clearance Issued: April 06, 2016
Ethics Clearance Expiry Date: April 06, 2017

Dear Ms. Timmers,

The Queen's University Health Sciences & Affiliated Teaching Hospitals Research Ethics Board (HSREB) has reviewed the application and granted ethics clearance for the documents listed below. Ethics clearance is granted until the expiration date noted above.

- Recruitment Advertisement
- Screening Script – Women
- Screening Script – Men
- Disinfection Protocol
- Pre and Post-Stimulation Questionnaire - Women
- Pre and Post-Stimulation Questionnaire – Men
- Debriefing Statement
- Information/Consent Form – Women
- Information/Consent Form - Men

Documents Acknowledged:

- CORE Certificate – A. Timmers
- CV – A. Timmers
- CV – M. Chivers

Amendments: No deviations from, or changes to the protocol should be initiated without prior written clearance of an appropriate amendment from the HSREB, except when necessary to eliminate immediate

hazard(s) to study participants or when the change(s) involves only administrative or logistical aspects of the trial.

Renewals: Prior to the expiration of your ethics clearance you will be reminded to submit your renewal report through ROMEO. Any lapses in ethical clearance will be documented on the renewal form.

Completion/Termination: The HSREB must be notified of the completion or termination of this study through the completion of a renewal report in ROMEO.

Reporting of Serious Adverse Events: Any unexpected serious adverse event occurring locally must be reported within 2 working days or earlier if required by the study sponsor. All other serious adverse events must be reported within 15 days after becoming aware of the information.

Reporting of Complaints: Any complaints made by participants or persons acting on behalf of participants must be reported to the Research Ethics Board within 7 days of becoming aware of the complaint. Note: All documents supplied to participants must have the contact information for the Research Ethics Board.

Investigators please note that if your trial is registered by the sponsor, you must take responsibility to ensure that the registration information is accurate and complete.

Yours sincerely,

Albert J. Clark.

Chair, Health Sciences Research Ethics Board

The HSREB operates in compliance with, and is constituted in accordance with, the requirements of the TriCouncil Policy Statement: Ethical Conduct for Research Involving Humans (TCPS 2); the International Conference on Harmonisation Good Clinical Practice Consolidated Guideline (ICH GCP); Part C, Division 5 of the Food and Drug Regulations; Part 4 of the Natural Health Products Regulations; Part 3 of the Medical Devices Regulations, Canadian General Standards Board, and the provisions of the Ontario Personal Health Information Protection Act (PHIPA 2004) and its applicable regulations. The HSREB is qualified through the CTO REB Qualification Program and is registered with the U.S. Department of Health and Human Services (DHHS) Office for Human Research Protection (OHRP). Federalwide Assurance Number: FWA#:00004184, IRB#:00001173

HSREB members involved in the research project do not participate in the review, discussion or decision.

Appendix F. Sexual Opinion Survey (SOS) – Homoeroticism factor

	Strongly Disagree						Strongly Agree
If I found that a close friend of mine was gay, lesbian, bisexual, or queer, it would annoy me.	1	2	3	4	5	6	7
Thoughts that I may have same-sex attractions would not worry me at all.	1	2	3	4	5	6	7
The idea of my being physically attracted to members of the same sex is not depressing.	1	2	3	4	5	6	7
When I think about seeing pictures showing someone of the same sex as myself masturbating, it nauseates me.	1	2	3	4	5	6	7

Appendix G. Novel sexual orientation items

Now, please think about having sexual contact with a man. How sexually interested or excited do you feel by the thought of having sex with a man?

- Not a tall
- A little bit
- Somewhat
- Definitely
- Extremely

Keep thinking about having sexual contact with a man. How "turned-off" or disgusted do you feel by the idea of having sex with a man?

- Not a tall
- A little bit
- Somewhat
- Definitely
- Extremely

Appendix H. The Disgust Propensity and Sensitivity Scale – Revised (DPSS-R)

Please select the option that best describes your beliefs.

	Never				Always
I avoid disgusting things	1	2	3	4	5
When I feel disgusted, I worry that I might pass out	1	2	3	4	5
It scares me when I feel nauseous	1	2	3	4	5
I think disgusting items could cause me illness/infection	1	2	3	4	5
I feel repulsed	1	2	3	4	5
Disgusting things make my stomach turn	1	2	3	4	5
I screw up my face in disgust	1	2	3	4	5
When I notice that I feel nauseous, I worry about vomiting	1	2	3	4	5
When I experience disgust, it is an intense feeling	1	2	3	4	5
I experience disgust	1	2	3	4	5
It scares me when I faint	1	2	3	4	5
I become disgusted more easily than other people	1	2	3	4	5
I worry that I might swallow a disgusting thing	1	2	3	4	5
I find something disgusting	1	2	3	4	5
It embarrasses me when I feel disgusted	1	2	3	4	5
I think feeling disgust is bad for me	1	2	3	4	5