An Evaluation of the Effect of Sexual Schemas on Attentional Biases and Sexual Stimuli Interpretations for Men With Varying Degrees of Sexual Dysfunction: A Multilevel Moderated Mediation Approach

AN EVALUATION OF THE EFFECT OF SEXUAL SCHEMAS ON ATTENTIONAL BIASES AND SEXUAL STIMULI INTERPRETATIONS FOR MEN WITH VARYING DEGRESS OF SEXUAL DYSFUNCTION: A MULTILEVEL MODERATED MEDIATION APPROACH

A Dissertation Presented

by

Robert Brandon Wyatt, M.A.

to

The Faculty of the Graduate College

of

the University of Vermont

In Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
Specializing in Clinical Psychology

October, 2025

Defense Date: 04/30/2025
Dissertation Examination Committee:

Antonio Cepeda-Benito, Ph.D., Advisor
Christine Velez, Ph.D., Chairperson
Keith Burt, Ph.D.
Elizabeth Pinel, Ph.D.
Timothy Stickle, Ph.D.
Holger Hoock, DPhil, Dean of the Graduate College

Abstract

Despite the availability of safe and effective medications for sexual dysfunction such as phosphodiesterase type 5 (PED5) inhibitors, many men continue to experience sexual dysfunction even when the physical ability to gain an erection is restored. The persistence of such difficulties evidences the indispensable role of psychological factors during sexual arousal. Prominent theories of sexual arousal underscore the important role that attention plays in this process (e.g., Barlow, 1986; Janssen, Everaerd, Spiering, & Janssen, 2000). While the extant literature on sexual function describes differences in attentional processing of sexual stimuli for men with and without sexual dysfunction, questions remain regarding why men with greater sexual dysfunction tend to focus on negative and non-sexual stimuli and make more negative interpretations of sexual stimuli compared to men with decreased sexual dysfunction. Considering the similarities between social anxiety (Mogg et al., 2002) and psychogenic sexual dysfunction (Barlow, 1986), it is possible that men with sexual dysfunction possess greater vigilance for stimuli which would convey threat to sexual performance (e.g., penile flaccidity). Individuals with sexual dysfunction may be vigilant toward facial expressions during partnered sex considering the amount of time men spend looking at the faces of nude females portrayed in sexual stimuli (Rupp and Wallen, 2004). Interestingly, facial expressions during heightened sexual arousal have been shown to be ambiguous (Fernandez-dolls et al., 2011; Wyatt & Rellini, In Preparation). Considering that men who are repeatedly exposed to unsuccessful sexual situations tend to develop sexual dysfunction schemas (Nobre, 2010), and because we tend to rely more heavily on schemas when faced with ambiguity (Labert & wedell, 1991), facial expressions during heightened states of sexual arousal may act as canvases for sexual dysfunction schemas to act upon during partnered sex. Correspondingly, we hypothesized that men with greater sexual dysfunction 1) would report greater pain in ambiguous sexual faces, that this effect would be mediated by sexual dysfunction schemas, and that this mediating effect would be moderated and thus significantly greater on trials primed with sexual stimuli; 2) would react faster to probes replacing pain faces, that this effect would be mediated by sexual dysfunction schemas, and that this mediating effect would be moderated and thus significantly greater on trials primed with sexual stimuli. Results from hierarchical linear modeling did not support these hypotheses. However, ancillary analyses revealed a partial mediation effect of helplessness schemas on associations between sexual dysfunction and interpretations of pain in ambiguous faces (indirect effect = β = 0.02, SE = 0.01, Z = 2.27, p = .023; c' = 0.07, SE = 0.03, Z = 2.57, p = .001). Surprisingly, mediation analyses for predicting reaction time revealed a suppressing effect of undesirability/rejection schemas (β = -0.04, SE = 0.004, Z = -4.46, p < .001) that, when included in the model resulted in an increase in effect from the total effect (β = 0.09, SE = 0.01, Z = 4.35, p < .001) to the direct effect (β = 0.14, SE = 0.01, Z = 5.64, p < .001), suggesting a dual-process model in which sexual dysfunction slows reaction to pain faces, while sexual schemas enhance attentional vigilance. This suppression effect was further witnessed for Incompetence, Self-Deprecation, and Difference-Loneliness schemas. Moreover, the suppression effects were witnessed in neutral face reaction times, suggesting possible spill-over effects between sexual and neutral-primed trials. Future directions are discussed considering the study's methodological limitations.

Table of Contents

List of Tables ..... **iv**

List of Figures ..... **v**

CHAPTER 1: Introduction **1**

1.1 Contemporary Theories of Attention **5**

1.2 Attention and Sexual Arousal **7**

1.5 Sexual Difficulties and Anxiety **13**

1.6 Dyadic Sexual Stimuli **16**

1.7 The Current Study **18**

CHAPTER 2: Methodology **22**

2.2 Participants **22**

2.2.1 Recruitment. 22

2.2.2 Sample Demographics. 22

2.3 Measures and Stimuli **24**

2.3.1 Demographics Questionnaire. 24

2.3.2 Descriptives and Covariates. 24

2.3.3 Contextual Primes. 25

2.3.5 Target Stimuli. 25

2.3.6 Perceived Pain and Pleasure. 25

2.3.7 Sexual Arousal Problems. 26

2.3.8 Sexual Frequency. 27

2.3.8 Sexual Schemas. 27

2.3.9 Manipulation Check. 28

2.4 Procedure 29

2.4.1. Habituation. 29

2.4.2 Part I. 29

2.4.3 Cool-down. 30

2.4.4 Part II, Dot Probe test for Pain and Neutral Faces. 30

2.4.5. Questionnaires. 31

2.4.6. Debriefing. 31

2.5 Analytic Strategy 31

CHAPTER 3: RESULTS 37

3.1 Data Cleaning 37

3.2 Descriptive Statistics and Bivariate Correlations 37

3.3 Testing Assumptions 38

3.4 Manipulation Check 39

3.5 Primary Analyses 39

Hypothesis 1: 39

Hypothesis 2: 40

3.6 Ancillary Analyses 41

Post hoc Hypothesis 1: 41

Post hoc Hypothesis 2: 42

CHAPTER 4: DISCUSSION 44

4.1 A Priori Hypotheses 44

4.2 Ancillary Analyses 48

4.3 Limitations and Future Directions 51

4.5 Conclusions 53

APPENDIX 55

Tables 55

Figures 79

REFERENCES 107

List of Tables

Table 1. Participant Demographic information 55

Table 2. Pearson correlations, means, and standard deviations 57

Table 3. Anderson-Darling Tests of Univariate Normality – Experiment 1 58

Table 4. Anderson-Darling Tests of Univariate Normality – Experiment 2 59

Table 5. VIF for Experiment 1 Predictors 60

Table 6. VIF for Experiment 2 Predictors 62

Table 7. Breusch Pagan Tests of Homoscedasticity for Experiment 1 64

Table 8. Breusch Pagan Tests of Homoscedasticity for Experiment 2 65

Table 9. Mardia's Test of Skewness and Kurtosis 66

Table 10. Moderated Mediation Analyses for Experiment Perceptions of Pain in Ambiguous Faces 67

Table 11. Moderated Mediation Pain Face Contrasts for Experiment 1 70

Table 12. Conditional Indirect Effects of Sexual Dysfunction Schemas for Pain Face Reaction Times 71

Table 13. Conditional Indirect Effects Contrasts for Experiment 2 75

Table 14. Mediation Analyses for Experiment 1 76

Table 15. Pain Face Mediation Analyses for Experiment 2 77

Table 16. Neutral Face Mediation Analyses for Experiment 2 78

List of Figures

Figure 1. 2-2-1-1 Multilevel Moderated-Mediation Model for Perceptions of Pain in Ambiguous Sexual Faces 79

Figure 2. 2-2-1-1 Multilevel Moderated Mediation Model for RT. 80

Figure 3. Proceedings of Experimental Trials 81

Figure 4. Plotted Residuals Regressing Incompetence Schemas on Perceptions of Pain in Ambiguous Sexual Faces. 82

Figure 5. Plotted Residuals Regressing Undesirability/Rejection Schemas on Perceptions of Pain in Ambiguous Sexual Faces. 83

Figure 6. Plotted Residuals Regressing Self-Deprecation Schemas on Perceptions of Pain in Ambiguous Sexual Faces. 84

Figure 7. Plotted Residuals Regressing Loneliness Schemas on Perceptions of Pain in Ambiguous Sexual Faces. 85

Figure 8. Plotted Residuals Regressing Helplessness Schemas on Perceptions of Pain in Ambiguous Sexual Faces. 86

Figure 9. Plotted Residuals Regressing Incompetence Schemas on Perceptions of Pain Face RTs. 87

Figure 10. Plotted Residuals Regressing Undesirability/Rejection Schemas on Perceptions of Pain Face RTs. 88

Figure 11. Plotted Residuals Regressing Difference-Loneliness Schemas on Perceptions of Pain Face RTs. 89

Figure 12. Plotted Residuals Regressing Helplessness Schemas on Perceptions of Pain Face RTs. 90

Figure 13. Plotted Residuals Regressing Self-Deprecation Schemas on Perceptions of Pain Face RTs. 91

Figure 14. Plotted Cook's Distance Scores for Helplessness Schemas in Experiment 1. 92

Figure 15. Plotted Cook's Distance Scores for Incompetence Schemas in Experiment 1. 93

Figure 16. Plotted Cook's Distance Scores for Undesirability/Rejection Schemas in Experiment 1. 94

Figure 17. Plotted Cook's Distance Scores for Self-Deprecation Schemas in Experiment 1. 95

Figure 18. Plotted Cook's Distance Scores for Difference-Loneliness Schemas in Experiment 1. 96

Figure 19. Plotted Cook's Distance Scores for Helplessness Schemas in Experiment 2. 97

Figure 20. Plotted Cook's Distance Scores for Incompetence Schemas in Experiment 2. 98

Figure 21. Plotted Cook's Distance Scores for Undesirability/Rejection Schemas in Experiment 2. 99

Figure 22. Plotted Cook's Distance Scores for Self-Deprecation Schemas in Experiment 2. 100

Figure 23. Plotted Cook's Distance Scores for Difference-Loneliness Schemas in Experiment 2. 101

Figure 24. Path Diagram for Mediation of Helplessness Schemas on the Relationship Between Sexual Dysfunction and Perceptions of Pain in Ambiguous Sexual Faces. 102

Figure 25. Path Diagram for Mediation of Undesirability/Rejection Schemas on the Relationship Between Sexual Dysfunction and Pain Face RTs. 103

Figure 26. Path Diagram for Mediation of Incompetence Schemas on the Relationship Between Sexual Dysfunction and Pain Face RTs. 104

Figure 27. Path Diagram for Mediation of Self-Deprecation Schemas on the Relationship Between Sexual Dysfunction and Pain Face RTs. 105

Figure 28. Path Diagram for Mediation of Difference-Loneliness Schemas on the Relationship Between Sexual Dysfunction and Pain Face RTs. 106

CHAPTER 1: Introduction

Psychological and relationship well-being continue to be negatively impacted in men who experience erectile dysfunction (ED) (Gomes & Nobre, 2012; Nobre & Pinto-Gouveia, 2009; Rusbult, Martz, & Agnew, 1998). Men who report greater severity in sexual difficulties also report being increasingly perturbed by performance concerns (Barlow, 1986; Gomes & Nobre, 2012; Wyatt, de Jong, Holden, 2018; Wyatt & de Jong, 2020), endorse significantly greater symptoms of depression and anxiety (Gomes & Nobre, 2012; Wyatt & de Jong, 2020), and are at increased risk of relationship dissolution (Rusbult, Martz, & Agnew, 1998). For many of these men, problems with ED continue to occur despite highly available and effective medicinal treatments such as phosphodiesterase type 5 (PED-5) inhibitors (e.g., Sildenafil and Cialis). As many as 70% of men who are prescribed PED-5 inhibitors discontinue use, despite the medication being an effective way to regain the ability to have an erection (Greenberg, Bruess, & Oswalt, 2014). These findings suggest that difficulties with gaining and maintaining erections may be linked to psychogenic mechanisms that perpetuate distress independently of their physiological functioning. Several theoretical models propose that attention is a key mechanism in sexual arousal (Barlow, 1986; Janssen, Everaerd, Spiering & Janssen, 2000; Masters & Johnson, 1970, Weigel et al., 2007). This literature has been evolved independently from the extensive attention literature in cognitive psychology. Yet, the components of attention described in sexual arousal research align with cognitive theories of attention, which distinguish between two key domains: preattention (before the threshold of awareness) and selective attention (governed by conscious cognitive processes; Broadbent, 1958; Treisman, 1969). Despite these parallels, the two lines of research rarely reference each other (Wyatt, 2023).

Despite the limited cross-referencing between sexual arousal and cognitive attention research, a small but growing body of work has begun to examine how preattentional and selective attentional processes function in the presence of sexual stimuli. Studies evaluating preattentional

processes activated in the presence of sexual stimuli have found mixed results (e.g., Spiering et al., 2003; Wyatt, 2023), but overall emphasize the important role that conscious (i.e., selective) attentional processes have on sexual arousal. In both studies, men responded faster to consciously perceived sexual images than neutral images. In addition, Spiering and colleagues (2003) found that men responded faster to dot probes that replaced consciously perceived sexual pictures when preattentively primed with sexual pictures compared to when preattentively primed with neutral pictures. In contrast, Wyatt (2023) did not observe an effect of preattentive sexual primes on the recognition of consciously perceived sexual targets and were thus unable to replicate findings by Spiering and collogues. The authors posit that millisecond accuracy in perceiving sexual stimuli may not be necessitated by the external demands present during sexual experiences. Instead, Wyatt (2023) highlights the important role of selective attentional processes during sexual arousal.

Research focusing on the mechanisms implicated in attracting and sustaining attention during sexual activity have most often used images that display either aroused genitals or people engaging in sexual activities as the "sexually relevant" content in their studies. However, such a practice ignores the fact that other contextual stimuli that are present during sex could also have an important effect on the sexual encounter. For instance, building on research indicating that heterosexual men often focus predominantly or exclusively on women's faces when evaluating attractiveness (Melnyk, McCord, & Vaske, 2014), it is plausible to expect that these gaze patterns would similarly occur during sexual encounters. Following this reasoning, an eye-tracking study found that men were more likely to first focus on the faces of nude women in erotic images rather than on their genitals or bodies, underscoring the importance of facial cues during sexual experiences (Rupp and Wallen, 2007). Building on the observation that faces often capture initial attention during sexual experiences, research also suggests that facial expressions at orgasm reflect both pain and pleasure (Wyatt & Rellini, In Preparation). These expressions, in turn, may serve as a "canvas" for individual differences in sexual function or sexual schemas (Wyatt, 2023). Despite

the inherent dyadic nature of partnered sex, information conveyed by one's sexual partner, and consequently the positive or negative interpretations that one might make because of their pre-existing cognitive schemas, has been largely neglected in the literature.

The relevance of attention to facial expressions during sex can be best understood utilizing the rich body of knowledge documenting the importance of interpreting facial expressions to understand emotional experiences of other people. Particularly, it seems appropriate to highlight the literature on social anxiety that has brought to light that individuals who are anxious about their ability to socially perform (i.e., individuals with social anxiety) place a considerable amount of effort to analyze faces of others (Mogg & Bradley, 2000, 2002; Mogg, Phillippot, & Bradley, 2004). Furthermore, the literature suggests that these individuals possess a greater vigilance for threat cues than their non-anxious peers (i.e., Mogg et al., 2002; Mogg et al., 2000; Mogg et al., 2004), and misappraise innocuous stimuli as threats to their social performance (Beck & Clark, 1988, 1996; Hyett & McEvoy, 2018).

The link between distorted interpretations of facial expressions and social anxiety (i.e., Mogg & Bradley, 2000, 2002; Mogg, Phillippot, & Bradley, 2004) suggests that there could also be a connection between erectile dysfunction and distorted interpretations of facial expressions. Specifically, men with sexual dysfunction often harbor heightened concerns about their sexual performance (Barlow, 1986), which can be seen as a form of social anxiety manifesting in sexual situations. If this sexual performance anxiety operates similarly to general social anxiety, we would expect these men to be especially vigilant for signs of unsuccessful performance, such as monitoring their partner's facial expressions during sex.

This hypothesis seems particularly relevant to sexual situations considering that the facial expressions of individuals during sex are ambivalent (i.e., possess aspects of both pain and pleasure; (Fernández-Dols, Carrera & Crivelli, 2011; Wyatt & Rellini, In Preparation). This heightened ambiguity requires more interpretation on the part of the individual and thus presents a greater

opportunity for risk of misinterpretation and confirmation bias (Rothman et la., 2017). Indeed, greater sexual arousal difficulties has been shown to negatively impact interpretations of ambiguous sexual faces (i.e., sexual faces which contain relatively similar levels of both pain and pleasure, particularly when these images were preceded by erotic stimuli (i.e., nude female models or heterosexual couples engaging in sex; Wyatt, 2023). Notably, the studies standardized the images by editing out contextual sexual cues (e.g., background details, bedding, cleavage), which theoretically removed the overt sexual context and left only the facial expressions. Despite this, participants with more pronounced sexual difficulties still reported higher levels of perceived pain in these ambiguous faces after erotic priming. This suggests that the erotic primes may activate negative sexual dysfunction schemas, leading to more negative interpretations.

However, some questions remain. Wyatt (2023) did not assess the degree to which participants perceived the IASF faces as sexual separately form primed experimental trials, and thus the absence of a manipulation check leaves us to speculate whether the sexual nature of the faces was truly removed, and whether primed sexual contexts account for differences in perceptions of pain in ambiguous faces when preceded by sexual versus neutral primes. Furthermore, no study has yet directly measured sexual schemas to provide support for their role in shaping these perceptions. Future research should address these gaps to clarify how negative sexual schemas may influence the interpretation of ambiguous facial expressions during sex. In summary, a review of the literature on erectile dysfunction, cognitive models of attentional processes, and studies on interpretation of emotions in facial expression point to a potential answer to a gap in our current understanding of sexual arousal. The proposed study aims to test the relevance of contemporary cognitive theories of attention and sexual functioning in a sample of men with various degrees of sexual arousal difficulties using a two-part study design. Part I aimed to explore how sexual schemas affect the way men with sexual dysfunction interpret contextual cues (i.e., facial

expression) relevant to the sexual experience. Part II sought to evaluate the effect that sexual schemas have on the capturing of attention of men with sexual dysfunction.

1.1 Contemporary Theories of Attention

The field of cognitive psychology has commonly divided attention into two key domains: preattention – which occurs fast and below one's level of attentional awareness; and selective attention – which represents our conscious perception of stimuli in our environment. Initially, stimuli from various sensory pathways (e.g., somatosensory, visual, olfactory, proprioceptive) are processed simultaneously through parallel channels (Driver, 2001; Broadbent, 1958; Treisman, 1969). During this stage of attention, varying properties (e.g., special properties such as mass, depth, color; Driver, 2001) of a given stimuli are extracted from the environment and processed at the same time (Driver, 2001). However, our perceptual capacities are limited, resulting in the need for parallel streams of stimuli information to bottleneck and converge to prevent sensory overload (Broadbent, 1958; Treisman, 1969). To meet this need, a preattentive filter selects for contextually relevant stimuli and brings them into one's focused attentional awareness, while filtering out irrelevant messages before they reach our attentional awareness.

Preattentive filtering has been demonstrated for a variety of stimuli, including information derived from both auditory and visual stimuli pathways. For example, studies examining preattentive auditory processing have demonstrated how contextually irrelevant information is filtered out using the "unattended ear" methodology. Results suggest that, when participants are instructed to attend to one ear over the other, they are unable to recall the auditory stimuli played to an unattended ear (Broadbent, 1958). One of the most notable examples of preattentive filtering is the "cocktail party" phenomenon, where individuals can focus on a single conversation while filtering out surrounding chatter in a noisy environment (Driver, 2001; Treisman, 1960).

Treisman (1986) further demonstrated the effects of preattentive filtering on visual stimuli perception and concluded that preattentive visual processes are attuned to the detection of basic elements of a visual stimulus such as shape, color, and texture. Later, the relevant components of various visual stimuli are selected for and pieced together to form a coherent visual reality (Treisman, 1986). Moreover, she proposed that preattentive visual search explains why, depending on the contextual demands, physical characteristics of a relevant stimulus tend to "pop-out" of an array of distracting visual stimuli (Treisman, 1986). For example, when looking for a word in a word search, preattentive processes are operating below one's perceptual threshold to, (a) perceive various elements of letters and words, and (b) selectively attend to the relevant letter components and letter pairs while filtering out the irrelevant ones by comparing the visual input with our mental representation of the target word (Oliver Selfridge, 1959). This ultimately results in the word seeming to appear suddenly before us in the word search.

However, studies on preattentive filtering provided mixed results (e.g., Broadbent, 1958; Treisman, 1960, 1969), suggesting that not all unattended stimuli are completely blocked from perception. Consequently, Treisman (1960, 1969) proposed that unattended stimuli, rather than being completely filtered out, are instead attenuated and thus attended to in less detail. Generally, unattended stimuli have an increased likelihood of being perceived if they possess a low threshold for identification. On the one hand, a stimulus might possess a low threshold of identification if it is evolutionarily advantageous for the stimuli to be inherently primed (e.g., fear responses, sexual arousal; Öhman & Mineka, 2001; Everaerd, 2007), or if the stimuli are highly relevant to the individual (e.g., hearing one's own name, confirmatory stimuli for men with sexually dysfunction; Barlow, 1986; Moray, 1969).

The selecting for and filtering out of stimuli at the bottleneck of converging pathways (Broadbent, 1958; Driver, 2001; Treisman, 1969) culminates in the selective, focused attention in which the stimuli which were selected for are brought into one's perceptual awareness. This stage

of attention has been described extensively in the literature on anxiety and sexual arousal (e.g., Beck & Clark, 1996; Janssen et al., 2000) and is characterized by top-down cognitive processes (Wyatt, 2023). In contrast to the fast and automatic nature of preattention, the higher demands in cognitive resources needed for selective attention results in a form of processing characterized by decreased speed and increased intentionality and deliberateness which rely upon working memory to suspend the selected stimuli in one's perceptual awareness (Driver, 2001). In other words, selective attention represents our focused perception of a stimulus, which has been selected for based on the contextual demands of a given situation.

1.2 Attention and Sexual Arousal

Contemporary theories of sexual arousal underscore the central role that attention plays in the facilitation of physiological and subjective sexual responses. According to the Information Processing Model of Sexual Arousal, a stimulus in one's environment is automatically (i.e., fast and effortlessly) appraised for sexual meaning by comparing these stimuli present in one's environment to stimulus meanings encoded in one's memory based on past experiences (Janssen et al., 2000). If the stimulus is appraised as sexual in meaning, a sexual response, such as physiological genital responses (e.g., penile engorgement and rigidity) and/or a subjective experience of being sexually aroused may occur. Moreover, this sexual response cycle acts as a positive feedback loop, in which the generated sexual responses become objects to be appraised by this information processing system, and in turn hold the potential to further increase one's level of sexual arousal until the point of orgasm (Janssen et al., 2000).

Preattentive and selective attentional processes are inherently present, although not explicitly stated, in Janssen and colleagues' theoretical model. In the early stages of sexual arousal, preattentive processing is responsible for automatically and effortlessly evaluating whether a stimulus possesses sexual meaning and initiates attentional orienting toward stimuli that have been

appraised as possessing sexual meaning. As a result, physiological sexual responses begin to occur even before the individual is aware of the presence of the stimuli or their physiological responses to them.

Later, preattentive filtering occurs, which selects for relevant sexual stimuli while simultaneously filtering out irrelevant stimuli. This in turn brings to fruition the experience of focused, selective attention to sexual stimuli which operates as a perceptual spotlight (Gopher & Iani, 2003) with a primary goal of holding the sexual stimuli in one's perceptual awareness. The combination of sexual neural networks, positive evaluation of the stimuli based off one's historical experiences related to the stimuli, and awareness of physiological sexual arousal results in the emergence of subjective sexual arousal (de Jong, 2009), while the continued appraisal and evaluation of sexual stimuli and our responses to them, create the positive feedback loop which culminates in the form of an orgasm (Janssen et al., 2000).

Studies examining preattentional processing of sexual stimuli provide mixed conclusions. First, Janssen et al. (2000) demonstrated that sexual stimuli can trigger sexual responses even when individuals are unaware of having perceived the visual images. This was accomplished using a masked dot probe priming task, in which visual sexual stimuli presented at millisecond speeds below perceptual awareness thresholds led to changes in penile diameter. Additionally, Spiering et al. (2003) found that, when primed with sexual stimuli presented below one's visual perceptual threshold, individuals were faster at recognizing dot probes which replaced sexual images presented on screen and reported greater subjective sexual arousal.

However, given the evolutionary advantages of detecting and responding to sexual stimuli (Everaerd, 2007), it stands to reason that humans likely are inherently predisposed to notice and prioritize sexual cues. This predisposition would lower the threshold for detecting sexual stimuli and lead to faster recognition times compared to non-sexual stimuli. Challenging this hypothesis, Wyatt (2023) replicated Spiering et al. (2003)'s methodology to assess whether preattentive

priming influences how quickly individuals respond to sexual stimuli in a dot-probe task. Participants were first exposed to either a sexual or neutral masked image displayed at 80% of their individual visual threshold. A pair of images (one sexual, one neutral) then appeared, followed by a dot that replaced one of the images. Participants had to indicate as quickly as possible whether the dot appeared on the right or left side of the screen. Contrary to Spiering et al.'s findings, Wyatt (2023) found no significant effect of the prime, thereby questioning the role of preattention in directing attention to sexual stimuli. They suggested that, from an evolutionary standpoint, detecting sexual cues with millisecond precision may not have been critical for human survival.

While these studies have focused on the importance of sexual stimuli to attract attention toward a sexual stimulus, an even more important aspect of attention during sexual activities is the distraction away from sexual stimuli. Indeed, attention may also serve to decrease or inhibit sexual arousal when one's attention is directed away from sexual stimuli that would otherwise be appraised as sexual and positive, and toward stimuli that are appraised as negative or non-sexual in meaning. Specifically, attentional preoccupation with distracting, negatively valanced stimuli during sexual experiences is at the core of two influential theories of sexual dysfunction (i.e., Masters & Johnson, 1970; Barlow, 1986). In one of the earliest theories of sexual arousal, Masters and Johnson (1970) introduced the concept of "spectatoring" to describe how men with sexual dysfunction mentally evaluate their own performance from a negative, third-person perspective—effectively becoming critical observers of their own sexual experiences (Faith & Schare, 1993).Therefore, rather than focusing on the passion and pleasure that might be occurring in the moment, the attention of these individuals instead becomes fixated on a skewed mental representation of how they are performing sexually, which in turn inhibits sexual arousal. Research on spectatoring and sexual functioning found that men who possessed greater concerns regarding the appearance of their penis also reported both a greater degree of engaging in spectatoring during sex and increased difficulties with their ability to become sexually aroused (Wyatt, de Jong, &

Holden, 2018). Further, these associations have been found to be moderated by trait-level anxiety and distractibility (Wyatt & de Jong, 2020). However, it is unclear whether spectatoring is inherently maladaptive and thus undeniably inhibits sexual functioning, or whether, depending on the degree of positive expectations one holds regarding their sexual performance, such positive expectations could result in positive affect (Geers & Lassiter 2002, 2003; see also Wilson et al., 1989) and in turn serve as sexually arousing stimuli to be positively appraised by information processing mechanisms during sex

Negative expectations regarding one's ability to perform sexually is at the center of Barlow (1986)'s model of sexual dysfunction and explains why, during partnered sex, men with sexual dysfunction are distracted by and preoccupied with stimuli that inhibit sexual arousal. Based on past sexual arousal difficulties, men with sexual dysfunction come to expect that, in the future, they will again have difficulties with sexual arousal (Nobre, 2010). Barlow's (1986) model describes a cycle in which internalized demands to perform flawlessly—such as maintaining a rigid erection—combine with past experiences of failure to create a state of anxious apprehension. In this state, men become hypervigilant, interpreting normal physiological signs of early sexual arousal, such as increased sympathetic and cardiac activity, as confirmatory indicators of anxiety and potential failure (Bach, Brown, & Barlow, 1999; Barlow, 1986; Rellini & Meston, 2011). This misinterpretation shifts their focus away from sexual stimuli and toward signs of impending negative outcomes, like losing an erection. Consequently, the reduction in sexual arousal reinforces their negative beliefs about their performance, perpetuating a dysfunctional positive feedback loop. Although not explicitly stated, this model underscores how maladaptive selective attention and negative interpretations of sexual cues contribute to sexual dysfunction. Empirical evidence supports Barlow (1986)'s model and suggests that sexual dysfunction results from an interplay between dispositional vulnerabilities inherent to the individual (i.e., trait anxiety; Wyatt & de Jong, 2020) and a history of past negative sexual experiences (Nobre, 2010), which lead men with sexual

dysfunction to experience negative automatic thoughts and seek out evidence to confirm their negative expectations (Rellini & Meston, 2011).

Considering that Individuals with sexual dysfunction, possess a great degree of anxiety regarding their ability to perform sexually (Barlow, 1986), and considering that anxious individuals experience a great degree of negative, automatic thoughts (Beck, and Clark 1996), it is likely that men with sexual dysfunction experience more negative automatic thoughts regarding their sexual experiences. As described in the literature, automatic thoughts are effortless and stem from dysfunctional schematic representations (i.e., core beliefs) that can be context-specific and operate under "if/then" rules (Beck, 1967). For example, an individual with a history of sexual dysfunction might possess the core belief that *if* they are unable to make themselves become erect in a moment's notice during sex *then* they won't be able to achieve an erection at all. This thought process is distorted, considering research demonstrating that sexual arousal responses are not under manual control (e.g. Janssen et al., 2000). As a result, these men may experience the thought "I cannot have an erection," or "I'm a failure" when they come to find that their penis is not responding in the ways they had hoped under the rigid demands they are placing on themselves. Indeed, research has found that men with a history of sexual dysfunction hold distorted sexual schemas (i.e., core beliefs) of sexual incompetence and experience negative automatic thoughts about their performance during partnered sex (Nobre, 2010).

Taken together, trait anxiety coupled with a greater frequency of exposures to unsuccessful sexual situations leads sexually dysfunctional individuals to think more negative automatic thoughts during sex, diverts their selective attention away from sexually relevant stimuli (e.g., sensations of pleasure) and toward non-arousing stimuli (e.g., automatic thoughts and their emotional reactions), and results in the losing of one's erection and the confirmation that their negative expectations are accurate and warranted. What remains unexplored in this model is

whether individuals with sexual dysfunction possess greater vigilance toward external stimuli conveying threat to their sexual performance (e.g., facial expressions conveying pain).

Evidence described in the literature regarding relationships between cognitive schemas and attention underscores the need for the integration of a personal salience into explanations of impairments in selective attentional processing of sexual stimuli for men with sexual dysfunction. During sex, both positively valenced/sexually relevant stimuli and negatively valenced/schematically relevant stimuli are competing for attention of men with sexual difficulties. Given the literature on vigilance for threat in anxious individuals (Beck & Clark, 1999), stimuli that are high on both negative valence and self-relevance may possess an increased ability to capture the attention of individuals with sexual dysfunction, while leaving the positive sexual stimuli present in the environment unattended. Wyatt et al. (2018)'s evaluation of genital self-perceptions in men with varying degrees of sexual functioning partially supports this model, finding that men who possess greater negative genital self-perceptions also report greater engagement with spectatoring during sex, and that spectatoring mediated associations between increasingly negative genital self-perceptions and self-reported sexual arousal difficulties. Moreover, these associations were even greater for individuals with higher levels of trait anxiety (Wyatt & de Jong, 2020).

However, these studies used a cross-sectional design via self-report measures and are thus unable to conclude whether the activation of self-schemas impact the tendency of men with sexual dysfunction to attend to negative confirmatory stimuli during sexual experiences. Moreover, individuals who are exposed to a greater frequency of unsuccessful sexual situations possess more negatively skewed sexual schemas (Nobre, 2010). For these individuals, negative, confirmatory stimuli may be more salient than for someone who has had significantly fewer difficulties during sex. Given the current state of the literature on sexual dysfunction and sexual schemas, questions remain regarding whether sexual dysfunction schemas mediate vigilance toward confirmatory

stimuli and increase the degree to which these individuals make skewed interpretations of sexual stimuli they are attending to.

In summary, various models of sexual function and dysfunction highlight the central role of attention in the sexual response cycle. According to the Information Processing Model of Sexual Arousal (Janssen et al., 2000), both preattentive and selective attentional processes are essential for the development of sexual arousal. Selective attention plays a key role in top-down interpretations of sexual responses and is closely tied to how individuals assign meaning to sexual stimuli (Janssen et al., 2000). For men with sexual dysfunction, dysfunctional cognitive schemas (e.g., I'm defective; Nobre 2010; Barlow 1986) can disrupt selective attention by triggering automatic negative thoughts during sex (e.g., "I'm going to lose my erection"). These thoughts shift attention away from positive sexual cues that would otherwise enhance arousal, redirecting it instead toward negative or non-sexual stimuli that reinforce biased beliefs about performance. The outcome is a reduction or loss of sexual arousal (Barlow, 1986; Masters & Johnson, 1970; Nobre, 2010; Weigel et al., 2007). Consequently, this model underscores the importance of interpreting potentially threatening stimuli. Studies examining how people attribute meaning to ambiguous cues—particularly those related to sexual performance—may offer valuable insights into these processes.

1.5 Sexual Difficulties and Anxiety

To better understand the differences in the ways in which men with and without sexual dysfunction interpret sexual stimuli, it is important to review findings from literature regarding the ambiguous nature of sexual stimuli. Specifically, theories of multiplicity of meaning of sexual stimuli (i.e., Janssen et al., 2000) posit that sexual stimuli comprise both positive, sexually relevant meanings as well as negative meanings (e.g., those associated with threat or dysfunction). Consequently, while a given sexual stimulus might activate a physiological sexual response and positive affective response (e.g., pleasure) in an individual without a history of sexual dysfunction,

the same stimulus may also a activate dysfunctional psychophysiological responses (i.e., threat vigilance, worry) in the sexually dysfunctional individual.

Cognitive theories on attentional processing of threat stimuli may shed light on why sexual stimuli would comprise threat meanings for men with sexual dysfunction. The information processing model of anxiety (Beck & Clark, 1997) illustrates the important role that attention plays in the etiology and maintenance of pathological anxiety. Fundamentally, an increased frequency of exposure to anxiety-provoking stimuli puts an individual at greater risk of developing negatively skewed cognitive schemas comprised of overestimation of the threat present in the stimulus, and an underestimation of one's ability to cope when the stimulus is present (Beck & Clark, 1997). Moreover, as distorted cognitive schemas become reinforced through repeated experiences, these experiences increasingly predict how individuals will respond to similar scenarios in the future (Beck, 1967). In the context of sexual dysfunction, frequent exposure to unsuccessful sexual situations—negative experiences marked by an inability to perform adequately or maintain an erection—tends to intensify distorted self-schemas. These distorted schemas make it more likely that men will experience automatic negative thoughts during future sexual encounters, which in turn distracts them from positive sexual cues that could otherwise facilitate arousal. Consequently, anxious threat meanings may become associated with sexual stimuli as these experiences are encoded into memory (Janssen et al., 2000), reinforcing a self-view of sexual inadequacy or incompetence (Nobre, 2010). Correspondingly, biased cognitive schemas developed through exposure to anxiety-provoking stimuli increase both one's sensitivity to these feared stimuli and the likelihood that the individual will demonstrate attentional vigilance for potentially threatening stimuli in the environment (Beck & Clark, 1997).

Other studies of threat vigilance in people with anxiety disorders have found that selective attentional processes are also involved and are directly responsible for altering the way in which individuals respond to perceived threatening stimuli. For example, research has demonstrated that

individuals with social anxiety possess greater vigilance for stimuli (such as angry faces) that, in turn, confirms their negatively biased beliefs about their ability to perform socially (Mogg & Bradley, 2000). While the literature suggests that dysfunctional cognitive schemas activate a preattentive selection for potentially threatening stimuli in the environment below one's level of awareness for individuals with panic disorder (Beck & Clark, 1997) and social anxiety disorder (Mogg & Bradley, 2000), research has yet to demonstrate this phenomenon in individuals with sexual dysfunction.

Although this threat vigilance has been demonstrated via preattentive priming paradigms (i.e., presenting participants with stimuli below their threshold of perceptual awareness; Mogg et al., 2000), a recent meta-analysis found selective attentional dot-probe priming tasks (i.e., presenting participants with primes above their visual perceptual threshold) was most robust in evaluating threat vigilance in socially anxious individuals (Bantin, Stevens, Gerlach, & Hermann, 2016). Moreover, socially anxious individuals appear to possess a lower threshold for detecting threatening social cues. Specifically, Mogg and Bradley (2004) demonstrated that socially anxious individuals engage in greater vigilance toward angry faces versus happy faces when completing a dot-probe priming task compared to non-anxious controls when primes were presented for 500ms. Between-group effects were no longer significant when stimuli were presented for 1,250ms. Bantin et al. (2016) interpreted these results as evidence that individuals with social anxiety possess a lower threshold of detection of threat in visual stimuli.

Considering how individuals with sexual difficulties experience a unique form of anxiety in a dyadic context where they are concerned about their ability to perform sexually (Barlow, 1986), the extant body of research on social anxiety provides a unique avenue to explore relationships between anxiety and sexual dysfunction by way of vigilance to sexual threat cues. Applied to sex, the well-established and strongly held performance concerns of men with sexual dysfunction (Barlow, 1986; Nobre, 2010) may cause men with these concerns to be more vigilant for

threatening sexual cues during partnered sex. For example, these men may be more likely to attend to cues that would confirm their biased beliefs regarding their ability to gain and maintain an erection, and they may also tend to interpret cues as threatening and confirming their anxiety. In support of these hypotheses, greater sexual dysfunction was positively correlated with higher perceptions of pain in the faces of people having an orgasm (Wyatt & Rellini, In Preparation).

Consequently, a reinforcement pattern may exist for sexual dysfunction in which increased sexual dysfunction leads to greater vigilance for negatively interpreted external clues regarding one's sexual performance (e.g., perceived discomfort expressed through a sexual partner's facial expressions), which in turn would confirm their negatively biased expectations regarding their ability to perform during sex (Barlow, 1986). Consequently, this focus on negative stimuli would likely disrupt to information processing of sexual stimuli required during sexual arousal (Janssen et al., 2000), resulting in an unsuccessful sexual situation which could reinforce the individual's skewed sense of sexual self (Nobre, 2010). Although threat vigilance and negative interpretation of cues have been investigated in anxiety disorders, there is a paucity of research evaluating whether negative sexual schemas operate in a similar manner for individuals with sexual dysfunction: increasing vigilance for perceived threats to one's ability to perform sexually and increasing the tendency to make negative attributions to contextual cues, such as facial expressions of a partner.

1.6 Dyadic Sexual Stimuli

Research on emotional facial expressions during sexual activity remains limited and is still in its early stages. In our laboratory, we have identified and standardized a set of pictures of people at the point of orgasm to better study emotional expressions during sex: Index of Ambiguous Sexual Faces (IASF, Wyatt & Rellini, In Preparation). During the validation of this instrument, we have confirmed that people perceive both pain and pleasure in the facial expressions of people having an orgasm. Of the 60 pictures used in the study, 30 (i.e., 15 male and 15 female) faces had a score

of +/- 1 SD from the average pain scores participants gave to the pain faces, and these same pictures also scored +/- 1 SD from the average pleasure score of happy faces sampled from a standardized set of faces (FACES, Ebner, Riediger & Lindenberger, 2010). Past scholars have pointed to the relevance of the ambiguity of signaling through facial expressions during sex. First, Masters and Johnson (1970) reported that, as sexual arousal climaxes to the point of orgasm, men and women make faces that resemble "grimaces, scowls, and frowns."

Recently, studies have found that facial expressions during orgasm are not purely random contractions of facial musculature, but rather, the muscular facial movements during these instances are the same muscles used for the expression of both pain and pleasure (e.g., Fernández-Dols et al. 2011; Hughs & Nicholson, 2008). Moreover, studies examining brain activation during experiences of pain and orgasm have found that these sensations share overlapping neural networks (Hughs & Nicolson, 2008) as evidenced by in how both produce activation of the insular cortex and anterior cingulate cortex in the forebrain (Casey et al., 2001; Komisaruk et al., 2004).

Furthermore, the type of pain expressed during orgasm seems to be different from other types of pain, as confirmed by machine learning analyses that evaluated differences between faces made during orgasm and during experiences of extreme pain and concluded that these two facial expressions are distinct (Chen et al., 2018). Both machine learning studies (i.e., Fernandez-dols et al., 2011; Chen et al., (2018) utilizing artificial intelligence as well as and studies utilizing participant self-reports (i.e., IASF; Wyatt & Rellini, In Preparation) point to a unique, albeit ambiguous, expression of sexual pleasure that has the potential for misinterpretation because of one's need for reliance on cognitive schemas for interpretation. It is feasible that distorted sexual schemas may lead individuals with sexual arousal difficulties to misinterpret the emotions conveyed through emotional facial expressions during sex as they search for stimuli that confirm their beliefs (Barlow, 1986). Preliminary support for this hypothesis has been presented in a recent study conducted in our laboratory (Wyatt, 2023), which found that a greater degree of sexual

arousal problems was associated with greater perceptions of pain in ambiguous sexual faces taken from the IASF (Wyatt & Rellini, In Preparation). However, caution is warranted when interpreting these findings, as participants in the study did not meet clinical cut-off scores for sexual dysfunction and generally displayed high levels of sexual function, raising questions about the generalizability of these results to clinical populations.

Although other facial expressions may be present during sexual experiences (e.g., still-face or flat affect), ambiguous facial expressions at the point of orgasm provide a unique opportunity to evaluate the powerful role of sexual schemas on the interpretation of stimuli which, through priming the sexual context, are appraised as sexual. In other words, because the context of these sexual faces has been removed through image-editing software, yet their positive and negative valences remain, we would expect different interpretations of these faces by men with and without sexual dysfunction when the sexual context of the images is restored by priming the images with sexual stimuli.

In summary, the existing research highlights selective attention as a key mechanism through which sexual schemas shape sexual functioning. Not only can selective attention pull focus away from sexual stimuli and toward "threatening" cues during sex, but it also biases how people interpret sexual information. Consequently, in settings where stimuli vary in emotional valence, individuals with sexual dysfunction may both actively seek out threatening sexual cues and misinterpret otherwise neutral or positive sexual stimuli as having a negative meaning.

1.7 The Current Study

The goal of this study was to test whether sexual schemas in men with sexual dysfunction may mediate (1) their interpretation of the emotional facial expressions of their sexual partners while having sex, and (2) their predisposition to direct their attention toward negatively valanced stimuli while having sex.

These broad aims were assessed using a two-part design. Part 1 focused on:

1. Examining how sexual dysfunction relates to perceived pain in a set of validated ambiguous faces of people experiencing orgasm (IASF; Wyatt & Rellini, In Preparation).
2. Investigating how sexual dysfunction schemas explain the relationship between sexual dysfunction and perceptions of pain in ambiguous faces.
3. Exploring how these associations are influenced by the presence of sexual stimuli theorized to provide context for the ambiguous faces (see Figure 1).

Correspondingly, the study tested a moderated-mediation hypothesis which posited that an assumed positive relationship between sexual dysfunction and the perception of pain in ambiguous faces would be mediated by sexual dysfunction schemas, and that this relationship would be stronger on experimental trials primed with sexual stimuli. That is, Hypothesis 1 hypothesized that men with greater sexual dysfunction will report greater perceptions of pain in ambiguous sexual faces, this relationship between sexual dysfunction and pain ratings will be mediated by sexual dysfunction schemas, and this mediating effect of sexual dysfunction schemas will be greater for trials in which face ratings are primed with sexual stimuli. Hypothesis 2 predicted a moderated mediation effect where the predictor is level of sexual dysfunction, the mediators are sexual schemata, the moderator is the presence (sexual stimuli) vs the absence (neural stimuli) of sexual schemata activation, and the outcome is the level of pain observed in ambiguous orgasm faces. Although previous literature did not find support for associations between sexual dysfunction and perceptions of pleasure in ambiguous orgasm faces (Wyatt, 2023) and thus hypotheses regarding relationships between these constructs were not pursued, participants were still asked to report the degree to which they perceive pleasure in ambiguous orgasm faces to adhere to standard practices outlined by Wyatt & Rellini (In Preparation).

Part 2 of the study focused on:

1. Examining how sexual dysfunction relates to the speed with which one reacts to faces conveying pain.
2. Investigating how sexual dysfunction schemas explain the relationship between sexual dysfunction and pain face reaction time (RT).
3. Exploring how these associations are influenced by the presence of sexual stimuli (see Figure 2).

Correspondingly, the study tested the degree to which men with varying degrees of sexual dysfunction vary in their attentional bias toward pain versus neutral faces. To assess the unique effects that sexually relevant contextual factors play on these associations, sexual pictures were utilized to prime participants in a dot-probe task in which sexual versus neutral primes were followed by a pair of facial expressions (i.e., one face depicting pain and one depicting an emotionally neutral face). This design allowed for the assessment of whether the effect of sexual dysfunction on reaction time was carried through sexual dysfunction schemas, and weather this effect was greater on trials primed with sexual stimuli. Given the literature exploring associations between sexual schemas and negative sexual expectations in men with sexual dysfunction (Weigel et al., 2007) and Mogg et al. (2000) vigilance versus avoidance, Part 2 hypothesized that men with greater sexual dysfunction would react faster to dot probes replacing pain faces, this relationship between sexual dysfunction and pain face reaction time would be mediated by sexual dysfunction schemas, and this mediating effect would be greater for trials in which dot probe trials are primed with sexual stimuli. That is, Hypothesis 2 predicted a moderated mediation effect where the predictor is level of sexual dysfunction, the mediators are sexual schemas, the moderators are prime (i.e., sexual vs. neutral stimuli) and probe (i.e., pain vs. neutral face) conditions, and the outcome is latency to locate the probes.

By recruiting a sample of individuals with varying degrees of sexual dysfunction and introducing a measure of sexual schemas, this study makes a substantial contribution to prior

research on how sexual dysfunction relates to reactions to negatively valanced stimuli. It also advances our understanding of selective attention and distraction from sexual cues—a topic that theoretical models emphasize, but few empirical studies have explored.

A key strength of this work is the use of both behavioral methods (i.e., priming) to theoretically activate sexual schemas and a self-report questionnaire to measure them, allowing for a more comprehensive assessment of schemas. While schemas are central to cognitive-behavioral models and are commonly discussed in therapy and theory, they remain difficult to operationalize. By employing two distinct modalities, this study offers deeper insight into how sexual schemas influence sexual functioning. Finally, the introduction of facial expression interpretation as a research focus provides an innovative perspective. Facial expressions are a critical aspect of partnered sexual experiences but have received little empirical attention. By examining how individuals interpret these expressions, the study broadens our understanding of the interplay between sexual schemas, attention, and the emotional dynamics of sexual interactions.

CHAPTER 2: Methodology

A power analysis for an LMM analysis was conducted using WebPower, an online power analysis software, to determine a sufficient sample size using an alpha of 0.05, a power of 0.80, and a medium effect size (f = 0.50) for a within-subjects moderated-mediation design with 40 repeated measures. Based on these assumptions, the desired sample size for the proposed study was 110 participants.

2.2 Participants

2.2.1 Recruitment. Participants with varying degrees of sexual dysfunction were recruited using Qualtrics Panel Services, a paid service used for sample pooling. Participants were sampled form actively managed, double-opt-in market research panels, and were compensated in various ways (e.g., sky miles, shopping discounts) dependent upon the way the participant opted into their respective research panel.

2.2.2 Sample Demographics. Data were analyzed from 156 participants. For the 156 heterosexual males included in the data analysis, mean age was 34.1 years (SD = 4.61). The majority (64.1%) were white, although Black/African American individuals made up a sizeable portion of participants (19.9%). The remaining participants identified as American Indian or Alaskan Native (1.9%), Chinese (1.9%), Vietnamese (0.6%), Filipino (1.9%), Korean (1.3%), Asian Indian (1.3%), Other Asian (1.3%), Chamorro (0.6%), Other Pacific Islander (5.1%), or Other (0.1%). Additionally, most participants reported a bachelor's degree or higher(78.2%) and endorsed being in an active sexual or romantic relationship at the time of the study (96.8%). As a result, the study largely consisted of highly educated straight white married male participants. See Table 1 for a full description of participant demographics.

2.2.3. Overview of Exclusion Criteria. To be eligible for the sexual dysfunction group, participants were required to be (a) between the ages of 25 and 40 years of age at the time of engaging in the study, (b) identify as male at birth, (c) exclusively or predominantly heterosexual, (d) sexually active within the last six months, (e) absent of a history of significant brain injury.

2.2.3.1 Criterion A: Participants must be between 25 and 40 years of age. Due to the sexual nature of the study, participants were required to be at least 25 years of age at the time of study. In addition, standards in sexual research suggest that excluding young adults allows for better collecting data from individuals with a greater variety of sexual experiences and sexual dysfunction (Seehuus, 2015; McCall, Rellini, Seal, & Meston 2007). In turn, participants were required to be at least 25 years old to participate in the study. Finally, based on literature demonstrating that sexual difficulties increase naturally with age and that 34.8 percent of men aged 40 to 70 years old had moderate to complete erectile dysfunction (Laumann, Paik, & Rosen, 1999), participants over the age of 40 years old were excluded from participating.

2.2.3.2 Criterion B: Participants were born biologically male and identified as a man. The following study aimed to evaluate group differences in attention to and interpretations of sexual stimuli for individuals with varying degrees of erectile dysfunction. This in turn necessitated those participants engaged in the study were assigned male at birth and identified as a man. Moreover, research has consistently demonstrated differences in psychological underpinnings of psychogenic precipitants of sexual dysfunction (i.e., Nobre, 2010, Rellini, 2011; Barlow, 1986; Sand & Fischer, 2007). Therefore, the extant literature justified the exclusion of participants based on gender and sex for the following study.

2.2.3.3 Criterion C: Participants must identify as predominantly heterosexual. The International Index of Erectile Function (Rosen, 1997) is considered the gold standard for diagnosing sexual dysfunction in men. The measure was developed to evaluate a variety of sexual difficulties for men in heterosexual relationships and who engage in heteronormative sexual

activities. For example, participants are asked how frequently their penis was rigid enough to penetrate their partner (Rosen, 1997). Although this measure has been adapted to assess sexual difficulties in men who have sex with men (MSM), the degree of adaptation makes it difficult to compare responses to the responses of heterosexual men (Kiss et al., 2020). As such, the current study required that participants identified as predominantly heterosexual to be included.

2.2.3.4 Criterion D: Participants must be sexually active within the last six months. The following study aimed to evaluate associations between sexual dysfunction, schemas, interpretations of pain, and vigilance toward pain stimuli – for sexually active men. However, considering the infrequency which men with sexual dysfunction may attempt to engage in sex due to fear or avoidance (American Psychological Association 2022), we relaxed our inclusion criteria from requiring individuals to have had sex within the past month to be included in the study, and allowed men to participate who have had sex at least once within the past six months.

2.3 Measures and Stimuli

2.3.1 Demographics Questionnaire. Questions regarding age, race, education attainment, parental education attainment, and perceived social class were included.

2.3.2 Descriptives and Covariates. Binary (i.e., yes/no) questions regarding history of traumatic brain injury, and video game use , and porn use were asked considering previous findings of their effects on the RT speed (Dane & Erzurumluoglu, 2003; Orosy-Fildes & Allan, 1989; Stuss et al., 1989). Additionally, previous studies have found that reactivity to sexual stimuli is skewed (Geer & Melton, 1977) and may be modulated by sexual history. Further, frequency of pornography viewing was assessed since studies have found that greater pornography use is associated with both greater sexual difficulties in men (Park et a., 2016) and increases in cue-reactivity to and attentional rigidity toward sexual stimuli (Jha & Banerjee, 2022). Pornography use was assessed using a two-item open-ended numeric-response measure which read, "How many days did you use

pornography (i.e., pictures, videos, erotic stories) over the past 14 days," and "On a given day that you used pornography over the past 14 days, how much time did you spend looking at porn, on average?" Finally, to gain information regarding ED medication use, participants were asked the following multiple-choice questions: "Do you use medications that facilitate erection?"

2.3.3 Contextual Primes. The proposed study utilized sexual and neutral pictures which served as contextual prime stimuli. Neutral primes included images of plants (i.e., flowers, mushrooms) and non-sexual images of women exercising as suggested by Spiering et al. (2003). Sexual primes contained erotic images of naked women or couples engaging in sex. Prime stimuli were used in Part I and Part II of the study. Primes used in the study have previously been standardized in accordance with guidelines from Spiering et al. (2003) to ensure similar levels of the color, luminescence, and size (Wyatt & Rellini, In Preparation). Specifically, the images were all set to the sepia using image editing software, set to 500 x 500 megapixels in size, and 0.35 lumens of brightness.

2.3.5 Target Stimuli. Neutral faces as well as faces expressing pain served as target stimuli for Part II of the study. These faces were taken from the FACES dataset (Ebner et al., 2010). Images in this dataset have been previously standardized in terms of positive and negative valence. Moreover, the images were standardized to ensure similar levels of the same size, color, and luminescence, (i.e., 500 x 500-megapixels in size, all sepia tone, 0.35 lumens brightness).

2.3.6 Perceived Pain and Pleasure. The degree of pain and pleasure perceived in the faces of people having sex was measured using the Inventory of Ambivalent Sexual Faces (IASF; Wyatt & Rellini, In Preparation). The IASF comprises 30 images of individuals at the point of orgasm that was developed using still images from video clips acquired from beautifulagony.com, an online community of individuals who upload videoclips of their facial expressions during orgasm. Stills of faces were found in previous studies to possess aspects of both pain and pleasure (Fernandez-dols et al., 2011; Wyatt & Rellini, In Preparation). The proposed study used 14 images from the

IA. Previously, images from this dataset showed adequate split-half reliability for pain and pleasure ratings, Spearman-Brown = .947 and .932, respectively. Moreover, IASF faces were shown to possess adequate convergent validity with levels of pain in pain faces and levels of pleasure in happy faces; and possessed adequate divergent validity with levels of pain in happy faces and levels of pleasure in pain faces. The finalized set of images included in the dataset, and from which we will be selecting from for the proposed study, were determined to be ambiguous because the mean degree of both pain and pleasure present in the images was between +/- 1SD of participant self-report ratings. Ratings of ambiguous facial expressions during orgasm was measured using two questions, which ask the participant "How much [pain / pleasure] do you see in this face." Participants were instructed to rate each face on a 5-point Likert scale, (0 = *Not Present*; 1 = *Slightly Present* to 4 = *Very Present*). Although questions regarding perceptions of pleasure were included to follow the standardized procedure outlined by Wyatt & Rellini (In Preparation), past research did not support a link between sexual dysfunction and perceptions of pleasure in ambiguous sexual faces (Wyatt, 2023), and thus no analyses will be conducted for this study regarding perceptions of please in ambiguous sexual faces.

2.3.7 Sexual Arousal Problems. Sexual arousal problems were measured using the International Index of Erectile Function (IIEF; Rosen et al., 1997) which is considered the "gold standard" in measuring erectile dysfunction (Rosen, Cappelleri, & Gendrano III, 2002). The Erectile Dysfunction subscale of the IIEF comprises six items and assesses one's ability to gain and/or maintain an erection during sexual activity. A sample item read, "How often were your erections hard enough for penetration during sexual activity?" (0 = *Not Applicable/No Sexual Activity*, 1 = *Almost Never/Never* to 5 = *Almost Always/Always).* The Erectile Function score was computed by calculating the sum score of all items on the Erectile Function subscale of the IIEF. Previous studies have found the Erectile Function domain of the IIEF to be highly reliable, in terms of internal consistency (i.e., Cronbach's α = .90 to .96; and test-retest reliability, r = .84 (Rosen et

al., 1997). To capture sexual difficulties for men with a history of sexual arousal problems (and who many have not had sex within the past month as a result), the IIEF was augmented with questions asking participants about their experiences within the past 6 months rather than the past month.

2.3.8 Sexual Frequency. The frequency that participants engage in sex was measured using the following items: "how often have you had sex in the last month?" and "How many weeks has it been since you last had sex?"

2.3.8 Sexual Schemas. Sexual schemas were measured using the Questionnaire of Cognitive Schema Activation in Sexual Context (QCSASC; Nobre & Pinto-Gouveia, 2009), a 28-item questionnaire that measures a variety of schemas that may be activated for individuals with sexual difficulties during sexual experiences. First, participants were presented with four dysfunctional sexual experience vignettes and were tasked with rating the frequency they experience each of the situations (1 = *Never Happens*, 5 = *Happens Often*). Second, participants were tasked with selecting as many emotions as possible that apply from a list of 10 emotions (e.g., sadness, worry) that they experienced during the situations they endorsed experiencing. Finally, participants were presented with 28 items and were asked to rate how true each statement was for them as it pertained to their thoughts and feelings regarding their dysfunctional sexual experiences. Confirmatory factor analyses revealed a five-factor structure for the full-scale QCSASC (i.e. Undesirability/Rejection, Incompetence, Self-deprecation, difference/loneliness, Helplessness) The full-scale QCSASC has been found to possess adequate internal consistency (i.e., Cronbach's $\propto$=.94, test–retest reliability; r =.66, $p < .05$), convergent validity when compared to scores on the Young Schema Questionnaire (r = .55, $p < .01$) , and discriminant validity evidenced in significantly greater scores on incompetence [t(96) = 2.26, $p < .05$] and full scale [t(96) = 2.26, $p < .05$] scores for men with sexual dysfunction compared to healthy controls. (Nobre & Pinto-Gouveia, 2009).Considering that Nobre 2010, when evaluating psychological determinants of erectile

dysfunction, found that activation of incompetence schemas was associated with greater sexual dysfunction – the following calculated separate schema domains and each of them separately as mediators in the models.

Responses on the QSASC were used to calculate the five dysfunctional schema domains by summing their corresponding items, with higher scores indicating greater negative schema activation during sexual experiences. The undesirability/rejection domain comprised 8 items and assessed the degree to which participants held beliefs that they are undesired and rejected by others. A sample item read, "I'm unlovable" (1 = *Completely False*, 5 = *Completely True*). The undesirability/rejection domain possessed adequate internal consistency, Cronbach's ∝= ,96. The incompetence domain comprised 8 items and assessed the degree to which participants held beliefs that they are failures. A sample item read, "I'm incompetent" (1 = *Completely False*, 5 = *Completely True*). The domain possessed adequate internal consistency, Cronbach's ∝= .95. The self-deprecate domain comprised 3 items and assessed the degree to which participants held negative self-worth beliefs. A sample item read, "I'm unworthy" (1 = *Completely False*, 5 = *Completely True*). The self-deprecate domain possessed adequate internal consistency, Cronbach's ∝= .88. The difference-loneliness domain comprised 3 items and assessed the degree to which participants held beliefs that they are different from others and lonely as a result. A sample item read, "I'm different" (1 = *Completely False*, 5 = *Completely True*). The difference-loneliness domain possessed adequate internal consistency, Cronbach's ∝= .71. Finally, the helplessness domain comprised 4 items and assessed the degree to which participants held beliefs that they are helpless and needy. A sample item read, "I'm helpless" (1 = *Completely False*, 5 = *Completely True*). The self-deprecate domain possessed adequate internal consistency, Cronbach's ∝= .79.

2.3.9 Manipulation Check. To verify that ambiguous faces did not activate sexual schemas independently of contextual sexual prime cues, participants were randomly presented with eight of the prime stimuli after the experimental trials while answering the study questionnaires.

Participants were asked to rate the degree to which they found each stimulus arousing on a 7-point Likert scale ranging from "Not at All Arousing," to "Extremely Arousing."

2.4 Procedure

This study was reviewed by the University of Vermont Institutional Review Board prior to data collection. After the recruitment and collection of informed consent, participants completed the following steps: (1) Habituation, (2) Part I: Ratings of Ambiguous Facial Expressions, (3) Cool Down, (4) Part II: Dot Probe Task, (5) Self-Report Questionnaires, and (6) Debriefing.

2.4.1. Habituation. Mirroring previous priming studies (e.g., Spiering et al., 2003; Wyatt, 2023), participants were given the opportunity to habituate to the experimental design of the study by familiarizing themselves with the software and display procedure. To accomplish this, participants were shown 15 images of neutral stimuli, with each image presented for 5 seconds, and will be instructed to "simply pay attention to the images they see on the screen." Only neutral stimuli were used during this task to eliminate the risk of prematurely priming participants with sexual pictures and consequently overshadowing potential effects of sexual primes on participant RTs during the experiment (Janssen et al., 2000).

2.4.2 Part I. Ambiguous Face Ratings after exposure to Sexual and Neutral Primes. In Part I, participants engaged in a priming task to assess the degree to which the effect of sexual dysfunction on interpretations of pain in ambiguous sexual faces was mediated by sexual dysfunction schemas, and weather this mediating effect of schemas was moderated by prime presentation (i.e., sexual vs. neutral). Participants were shown sexual and neutral contextual primes presented above their threshold of awareness (i.e., conscious primes) which were followed by faces from the IASF (Wyatt, 2023) that they rated on dimensions of pain and pleasure. Participants completed 2 practice trials that utilized neutral primes and happy faces found in the FACES dataset (Ebner et al., 2010), followed by 14 counterbalanced experimental trials (i.e., 7 sexual, and 7 neutral

primes). Replicating methods by Wyatt (2023); see also Spiering et al., 2003), a fixation dot was presented for 1,000ms and followed by a 1,000ms pause and blank screen. Next, participants were presented with a sexual or a neutral prime (picture) that remained on the screen for 500ms, which was followed by one of the IASF faces. At this point in each trial, participants were asked to answer the two Likert-style questions asking how much they perceived pain and pleasure in the IASF face for that trial (see Figure 3).

2.4.3 Cool-down. After completing the first experiment, participants were instructed to relax for 2 minutes. The purpose of this break between experiments was to reduce carry-over of residual effects from Part I to Part II of the experiment (Janssen et al., 2000; Spiering et al., 2003). During this time, the INQUISIT Web software presented participants with a countdown and a slide show of gardens across the world accompanied by relaxing music and were not allowed to advance until the timer reaches "0:00."

2.4.4 Part II, Dot Probe test for Pain and Neutral Faces. In Part II, participants engaged in a dot-probe priming task to assess the degree to which the effect of sexual dysfunction on reaction time was mediated by sexual dysfunction schemas, and whether this mediating effect was moderated by prime (i.e., sexual vs. neutral) and probe (i.e., pain vs. neutral) conditions. Following guidelines established by Mogg et al. (2002), a fixation dot was presented for 1000ms, followed by a 1000ms pause. Following the pause, a prime (i.e., Sex / Neutral) was presented on the screen for 500ms, which was followed by a stimulus pair (i.e., pain face and neutral face pair) that was displayed on the right and left side of the monitor for 500 milliseconds as this has been shown in a meta-analysis to be the ideal time to activate threat-vigilance responses in dot probe tasks (Bantin et al., 2016). Once both the left and right images were removed from the screen, a dot replaced one of the two pictures and participants were asked to press one of two keys (i.e., N or M) to indicate if the probe is replacing the stimulus on the left or the right side of the monitor, respectively. Participants completed 2 practice trials that utilized neutral primes (i.e., one neutral face, and one

happy face from the FACES image set), followed by 40 (i.e.,10 sex contextual prime/pain target, 10 sex contextual prime/ neutral target, 10 neutral contextual prime/pain target, and 10 neutral contextual prime /neutral target) counterbalanced experimental trials. The location of the probe was randomized and counterbalanced. A faster response was an indication that the person was already looking on the side of the screen where the dot appeared. See Figure 3 for details outlining the experimental trials for Part II.

2.4.5. Questionnaires. Upon completion of both Part I and Part II experimental trials, participants completed the IIEF, QSASC, covariate questions, and manipulation check questions. Three attention-check items were presented randomly to the participants in this section to evaluate random responding and will ask participants to "select *Not at All* if you are paying attention."

2.4.6. Debriefing. At the end of the study participants were presented with a debriefing document outlining the purpose of the experiments.

2.5 Analytic Strategy

A four-step multilevel moderated-mediation analysis (Model 1) was utilized to test Hypothesis 1: Men with greater sexual dysfunction will report greater perceptions of pain in ambiguous sexual faces, this relationship between sexual dysfunction and pain ratings will be mediated by sexual dysfunction schemas, and this mediating effect of sexual dysfunction schemas will be greater for trials in which face ratings are primed with sexual stimuli. In Model 1, factors were entered as fixed effects while the intercepts of each slope were allowed to randomly vary. Notation for the multilevel mediation model in Part I of the study is described below:

Model 1: 2-2-1-1 multilevel moderated mediation evaluating the conditional indirect effect of sexual dysfunction on perceptions of pain in ambiguous faces, mediated by sexual schemas, and moderated by prime stimuli (i.e., sexual vs neutral).

Step 1[1]

(1) L2: M_i (Sexual Schema) $= \gamma_{00} + \gamma_{01}(\text{Sexual Dysfunction}_j) + \gamma_{02}(\text{PornUse}_j) + \gamma_{03}(\text{Age}_j) + \gamma_{04}(\text{Glasses}_j) + \gamma_{05}(\text{Computer Platform}_j) + \gamma_{06}(\text{TBI}_j) + \gamma_{07}(\text{EDMeds}_j) + \gamma_{08}(\text{Sexual Frequency}_j) + u_{0j}$

Step 2

(2) L1: $Y_{ij}(\text{Rating}) = \beta_{0j} + r_{ij}$

(3) L2: $\beta_0 = \gamma_{00} + \gamma_{01}(\text{Sexual Dysfunction}_j) + \gamma_{02}(\text{Porn Use}_j) + \gamma_{03}(\text{Age}_j) + \gamma_{04}(\text{Glasses}_j) + \gamma_{05}(\text{Computer Platform}_j) + \gamma_{06}(\text{TBI}_j) + \gamma_{07}(\text{EDMeds}_j) + \gamma_{08}(\text{Sexual Frequency}_j) + u_j$

Step 3

(4) L1: Y_{ij} (Rating) $= \beta_{0j} + \beta_1(\text{Prime}_{ij}) + \beta_2(\text{Sexual Schema}_j) + \beta_3(\text{Prime}_{ij} \times \text{Schema}_j) + r_{ij}$

Step 4

(5) Indirect Effect $= a_1 \times (\beta_2 + \beta 3 \times W)$

(6) Total Effect $= \gamma_{01} + \beta_2 + \beta 3 \times W$

(7) Direct Effect $= \beta_2 + \beta 3 \times W$

[1]Mediation has been traditionally tested using the causal steps approach (i.e., Baron & Kenney, 1986). However, the current state of the literature suggests that this method has its limitations. Specifically, confirmation of a significant a, b, and c path is not necessary for mediation if the indirect effect (i.e., ab path) is significant (Hayes & Rockwood, 2016).

Model 1 follows a 2-2-1-1 multilevel moderated-mediation structure using multilevel structural equation modeling (MSEM) guidelines proposed by Zhang, Zyphur, Preacher, and Bird (2019) to test the indirect effect of sexual dysfunction (Level 2 predictor) carried through sexual dysfunction schemas (Level 2 mediator) on perceptions of pain in ambiguous sexual faces (Level 1 outcome), and how prime condition (i.e., sexual vs. neutral; Level 1 moderator) conditionally moderates this indirect effect. Subscripts *i* and *j* refer to the *i*th trial of the *j*th participant; β_{0j} represents the intercept for each participant. Furthermore, r_{ij} represents unexplained *within-subject* variability across trials while u_j represents unexplained *between-subject* variability in sexual schemes. In Step 1, sexual dysfunction schemas (Level-2 mediator) are regressed onto sexual dysfunction (Level 2 predictor) to estimate the *a* path. Covariates (i.e., Hours of Porn Use, Age, Prescription Glasses Use, Computer Platform, TBI history, Ed Medication Use, and Sexual Frequency) are included in the model to account for between-subject variability. Step 2 estimates the total effect (*c* path) of sexual dysfunction (Level-2 predictor) on pain ratings (Level-1 outcome). Step 3 introduces sexual schemas (Level-2 mediator), priming condition (i.e., sex vs. neutral; Level-1 moderator) and their interaction (Prime × Schema) as predictors of pain ratings. This step estimates the *b* path, the direct effect (*c prime*), and tests for the mediating effect of sexual dysfunction schemas is moderated by prime condition. Step 4 represented the extraction of key effect estimates from the full model specified in Step 3. Specifically conditional indirect effects were estimated to test whether the strength of the indirect effect of sexual dysfunction on pain ratings – carried through sexual dysfunction schemas – varied based on prime condition. The indirect effect was calculated as the product of $a \times b$. The direct effect (*c prime*) represented the portion of the effect of sexual dysfunction on pain scores not accounted for by the indirect effect of sexual dysfunction schemas. The total effect – modeled in Step 2 – represented the overall effect of sexual dysfunction on pain ratings prior to the inclusion of the mediator.

A four-step multilevel moderated-mediation analysis (Model 2) was utilized to test Hypothesis 2: Men with greater sexual dysfunction will react faster to dot probes replacing pain faces, this relationship between sexual dysfunction and pain face reaction time will be mediated by sexual dysfunction schemas, and this mediating effect will be greater for trials in which dot probe trials are primed with sexual stimuli. Model 2 were entered as fixed effects while the intercepts of each slope were allowed to randomly vary. Notation for the multilevel mediation model in Part II of the study is described below:

Model 2: Multilevel moderated mediation evaluating the conditional indirect effect of sexual dysfunction on RTs to pain faces in a dot probe task, mediated by sexual schemas, and moderated by prime (i.e., sexual vs neutral) and probe (i.e., pain vs. neutral) stimuli.

Step 1

(1) L2: M_j (Sexual Schema) $= \gamma_{00} + \gamma_{01}(\text{Sexual Dysfunction}_j) + \gamma_{02}(\text{PornUse}_j) + \gamma_{03}(\text{Age}_j)$

$+ \gamma_{04}(\text{Glasses}_j) + \gamma_{05}(\text{Computer Platform}_j) + \gamma_{06}(\text{TBI}_j) + \gamma_{07}(\text{EDMeds}_j) + \gamma_{08}(\text{Sexual Frequency}_j) + u_{0j}$

Step 2

(2) L1: $Y_{ij}(\text{Reaction Time}) = \beta_{0j} + r_{ij}$

(3) L2: $\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{Sexual Dysfunction}_j) + \gamma_{02}(\text{Porn Use}_j) + \gamma_{03}(\text{Age}_j) + \gamma_{04}(\text{Glasses}_j) +$

$\gamma_{05}(\text{Computer Platform}_j) + \gamma_{06}(\text{TBI}_j) + \gamma_{07}(\text{EDMeds}_j) + \gamma_{08}(\text{Sexual Frequency}_j) + u_j$

Step 3

(4) L1: Y_{ij}(Reaction Time) = β_{0j} + β_1($Prime_{ij}$) + β_2($Probe_{ij}$) + β_3($Schema_j$) + β_4($Prime_{ij}$ × $Schema_j$) + β_5($Probe_{ij}$ × $Schema_j$) + β6($Probe_{ij}$ × $Prime_{ij}$ × $Schema_j$) + r_{ij}

Step 4

(5) Indirect Effect = $a \times (\beta_2 + \beta_3 \times W_1 + \beta_4 \times W_2 + \beta_5 \times W_1 \times W_2)$

(6) Total Effect = $\gamma_{01} + \beta_2 + \beta_3 \times W$

(7) Direct Effect = $\beta_2 + \beta_3 \times W$

Model 2 also follows a 2-2-1-1 multilevel moderated-mediation structure using multilevel structural equation modeling (MSEM) guidelines proposed by Zhang et al. (2019) to test the indirect effect of sexual dysfunction (Level 2 predictor) carried through sexual dysfunction schemas (Level 2 mediator) on dot probe reaction time (Level 1 outcome), and how prime condition (i.e., sexual vs. neutral; Level 1 moderator) and probe condition (i.e., pain vs. neutral) conditionally moderates this indirect effect. Subscripts *i* and *j* refer to the *i*th trial of the *j*th participant; β_{0j} represents the intercept for each participant. Furthermore, r_{ij} represents unexplained *within-subject* variability across trials while u_j represents unexplained *between-subject* variability in sexual schemes. In Step 1, sexual dysfunction schemas (Level-2 mediator) are regressed onto sexual dysfunction (Level 2 predictor) to estimate the *a* path. Covariates (i.e., Hours of Porn Use, Age, Prescription Glasses Use, Computer Platform, TBI history, Ed Medication Use, and Sexual Frequency) are included in the model to account for between-subject variability. Step 2 estimates the total effect (*c* path) of sexual dysfunction (Level-2 predictor) on reaction time (Level-1 outcome). Step 3 introduces sexual schemas (Level-2 mediator), priming condition (i.e., sex vs. neutral; Level-1 moderator), probe condition (i.e. pain vs. neutral; Leve-1 moderator), and their interaction (i.e., Prime × Schema, Probe × Schema, Prime × Probe × Schema) as predictors of reaction time. This step estimates the *b* path, the direct effect (*c prime*), and tests for the mediating

effect of sexual dysfunction schemas moderated by prime condition. Step 4 represented the extraction of key effect estimates from the full model specified in Step 3. Specifically conditional indirect effects were estimated to test whether the strength of the indirect effect of sexual dysfunction on reaction times – carried through sexual dysfunction schemas – varied based on both prime and probe condition. The indirect effect was calculated as the product of $a \times b$. The direct effect (*c prime*) represented the portion of the effect of sexual dysfunction on reaction time not accounted for by the indirect effect of sexual dysfunction schemas. The total effect – modeled in Step 2 – represented the overall effect of sexual dysfunction on reaction time prior to the inclusion of the mediator.

CHAPTER 3: RESULTS

3.1 Data Cleaning

Practice trials and incorrect responses were removed from the dataset, as well as duplicated data from participants who attempted to take the RT experiment twice. A total of 2940 face ratings and 8400 RTs were collected from 210 participants. Of these, 19 participants failed two of three attention checks. 25 participants were excluded for failing to complete experiments or respond to questionnaires, 10 duplicates were removed from the dataset, 6 participants were removed for not having had sex in the last 6 months despite indicating so in the screener, and 4 participants were removed for random responding (i.e., selecting "left" on all 40 dot probe trials"). These filtering's of the data resulted in the exclusion of 896 face ratings and 2560 RTs. Finally, following guidelines by (Mogg, Bradley, Hyare, & Lee, 1998), 357 dot probe RTs were excluded because they were quicker than 200ms or longer than 1500ms. Consequently, the resulted in the removal of 30 percent of face ratings and RTs, and 21 percent of participants overall, leaving a final dataset of 2170 face ratings for Part I and 5412 RTs for Part II, across 156 participants.

3.2 Descriptive Statistics and Bivariate Correlations

Table 2 presents Means, SDs, ranges, and zero-order (Pearson) correlations for all variables in the models. Correlation analyses revealed significant positive correlations among all RTs (i.e., sexual prime – pain probe, neutral prime – pain probe, sexual prime – neutral probe, neutral prime – neutral probe) conditions at the p <.01 significance level. RT means and standard deviations revealed minimal variability in RTs across the four conditions. Correlation analyses evidenced significant correlations between sexual dysfunction and two of the RT conditions (i.e., sexual prime – neutral probe, r = .174, p < .05; neutral prime- pain probe, r = .187, p < .05). Moreover, sexual dysfunction was significantly correlated with all sexual dysfunction schemas at the p < .001 level, and most strongly correlated with Incompetence Schema (i.e., r = .458), reflecting findings from

Gomes and Nobre (2012). The more hours of porn an individual watched in the past week was associated with greater undesirability/rejection (r = .185, p <.05), self-deprecation (r = .202, p < .05), and helplessness (r = .219, p < .001) schemas, as well as greater perceptions of pain in sexual faces (r = .323, p <.001) . However, the association between sexual dysfunction score and sexual activity frequency was not significant (r = .085, p > .05).

3.3 Testing Assumptions

Assumptions for structural equation modeling were conducted prior to main analyses. Univariate normality tests (i.e., Anderson-Darling) revealed non-normal distributions across all observed variables (p < .001 for all; see Tables 3 and 4 below). Variance Inflation Factors (VIFs; Tables 5 and 6 below) were used to assess multicollinearity, with all VIF suggesting low multicollinearity (Kutner et al., 2005, pp. 407 – 410). Additionally, linearity and homoscedasticity were examined using residuals vs. fitted plots in addition to the Breusch-Pagan test (Woolridge, 2013, pp. 275 – 278; for residual plots see figures 4 - 13 below). Breusch-Pagan analyses revealed significant homoscedasticity for all models (i.e., Undesirability/rejection, Incompetence, Self-Deprecation, Difference-Loneliness, and Helplessness schema models) for analyses in Part I and II (Table 7 and 8 respectively). Multivariate normality was examined using Mardia's test (Oppong & Agbedra, 2016), which revealed statistically significant non-normality in data distribution for variables in Part I (Mardia Skewness = 4708.34, Kurtosis = 5367.60, p < .001) and Part II (Mardia Skewness = 13505.70, Kurtosis = 14537.34, p < .001; see Table 9). Finally, outliers were examined via Cook's Distance (Kutner et al., 2005, pp. 400 - 406), with no extreme influence detected (Figures 14-23 below). Considering findings from assumptions analyses, maximum likelihood estimation (MLR) was used in all Lavaan models as a robust tool to account for the non-normality and heteroskedasticity of the data.

3.4 Manipulation Check

An independent samples *t* test was used to contrast the degree to which participants found sexual versus neutral primes to be arousing. Participants reported that sexual primes ($M = 4.15$, SD = 1.86) were significantly more arousing than neutral primes ($M = 1.77$, SD = 2.01), t (1385.90) = -22.909, $p < .001$. Based on subjective reports of degree of reusability, participants found sexual images to be more arousing than neutral images. Consequently, these sexual images appeared to appropriately prime the sexual contexts we aimed to activate in our experimental trials.

3.5 Primary Analyses

Hypothesis 1: Men with greater sexual dysfunction will report greater perceptions of pain in ambiguous sexual faces, this relationship between sexual dysfunction and pain ratings will be mediated by sexual dysfunction schemas, and this mediating effect of sexual dysfunction schemas will be greater for trials in which face ratings are primed with sexual stimuli. To test this hypothesis, a series of five repeated measures, hierarchical moderated mediation analyses were conducted. The multilevel moderated mediation model was estimated using robust maximum likelihood estimation (MLR) with clustered standard errors (clusters = 156 participants). Covariates (i.e., hours of pornography use, age, glasses use, computer platform, TBI history, use of erectile dysfunction medications, sexual frequency, and hours of video game use) were included in level 2 of the model. Table 10 displays the full moderated mediation outcome regression results for each model. Of the five analyses (one per dysfunction schema), none of the associations between sexual dysfunction and pain ratings were mediated by sexual schemas. Similarly, none of the interactions between sexual schemas and sexual primes on the perception of pain in ambiguous sexual faces were significant. Therefore, there was no evidence of conditional mediation of sexual dysfunction schemas for association associations between sexual dysfunction and pain ratings. All covariates

significantly predicted helplessness schemas at the $p < .001$ level of significance (see Table 10). Consequently, findings from Part I did not support moderated mediation. Contrasts for the conditional indirect effects compared reaction time to pain face probes where sexual stimuli primes were compared against a neutral prime reference (i.e., control) condition (see Table 11).

Hypothesis 2: Men with greater sexual dysfunction will react faster to dot probes replacing pain faces, this relationship between sexual dysfunction and pain face reaction time will be mediated by sexual dysfunction schemas, and this mediating effect will be greater for trials in which dot probe trials are primed with sexual stimuli. To test this hypothesis, five repeated measures, hierarchical moderated mediation analyses were conducted. All covariates except hours spent playing video games significantly predicted RTs in all models at the $p <.001$ level (see Table 12). Contrasts for the conditional indirect effects compared reaction time to pain face probes where sexual stimuli primes were compared against a neutral prime reference (i.e., control) condition (see Table 13).

Support emerged for mediating effects of three sexual dysfunction schemas: Undesirability/Rejection, Incompetence, and Self-Deprecation (see Table 13). The indirect effects of undesirability/Rejection sexual schemas primed with either neutral primes ($\beta = -0.04$, SE = 0.01, z = -3.00, $p = .003$) or sexual primes ($\beta = -.04$, SE = 0.01, z = -3.74, $p < .001$) could be congruent with the hypothesis that individuals who experience greater severity in sexual dysfunction also report higher levels of sexual undesirability/rejection schemas, which in turn enhances their vigilance for negative cues and thus register lower RTs to locate probes that are previously primed with faces conveying pain. However, the index of moderation for undesirability/rejection schemas at different levels of the sexual/neutral prime by pain/neutral probe was not significant ($\beta = -0.01$, SE = 0.01, z = -0.49, $p = .626$). Restated, the mediation of the association between sexual dysfunction and RT through sexually and neutrally primed schemas did not differ between each other nor as a function of pain/neutral priming of the RT probe.

The same pattern of results emerged for the conditionally mediated analyses involving incompetence and self-deprecation sexual schemas. That is, the indirect effects of incompetence sexual schemas when primed with neutral primes (β = -0.04, SE = 0.004, z = -3.10, p = .002) and sexual primes (β = -0.04, SE = 0.004, z = -3.86, p < .001) were statistically significant, but the index of moderation was not significant (β = -0.01, SE = 0.01, z = -0.55, p = .583). Likewise, the indirect effects of self-deprecation sexual schemas when primed with neutral primes (β = -0.05, SE = 0.004, z = -4.60, p < .001) and sexual primes (β = -0.06, SE = 0.004, z = -5.67, p < .001) were statistically significant, but the index of moderation incompetence was not significant (β = -0.01, SE = 0.01, z = -0.75, p = .453). Overall, results from moderated mediation analyses suggested sexual schemas may mediate the relationship between sexual dysfunction and RT, but there was no support for the hypothesis that this mediation was different for sexually vs neutrally primed schemas nor for negatively vs neutrally primed RT probes.

3.6 Ancillary Analyses

Post hoc Hypothesis 1: Sexual dysfunction schemas mediate the association between sexual dysfunction and perceptions of pain in sexually ambiguous faces. To examine whether the relationship between sexual dysfunction and ratings of pain in sexual faces was carried through sexual dysfunction schemas, a series of five repeated measures, hierarchical mediation analyses were conducted. The multilevel mediation model was estimated using robust maximum likelihood estimation (MLR) with clustered standard errors (clusters = 150 participants). Covariates (i.e., hours of pornography use, age, glasses use, computer platform, TBI history, use of erectile dysfunction medications, and sexual frequency, hours of video game use) were included in level 2 of the model (see Table 14). A significant mediation relationship emerged for the effect of sexual dysfunction on interpretations of pain in ambiguous sexual faces, carried through helplessness sexual schemas. Greater sexual dysfunction significantly predicted greater severity in helplessness

sexual schemas ("*a"* pathway*;* $\beta = 0.35$, SE = 0.03, z = 14.80, $p < .001$), while greater helplessness sexual schemas significantly predicted greater perceptions of pain in ambiguous sexual faces ("*b"* pathway*;* $\beta = 0.06$, SE = 0.03, z = 2.33, $p = .03$). Moreover, the total effect ("*c"* pathway*;* $\beta = 0.09$, SE = 0.03, z = 3.66, $p < .001$) and direct effect ("*c'"* pathway*;* $\beta = 0.07$, SE = 0.03, z = 2.57, $p < .001$) of sexual dysfunction significantly predicted greater perceptions of pain in sexual faces. Results suggested the positive relationship between sexual dysfunction and the interpretation of pain in sexually ambiguous faces was significantly mediated by helplessness sexual schemas (indirect effect pathway*;* $\beta = 0.02$, SE = 0.01, z = 2.27, $p = .023$; see Figure 24).

In contrast to helplessness, undesirability/rejection ($\beta = 0.01$, SE = 0.01, z = 0.59, $p = .555$), incompetence ($\beta = 0.001$, SE = 0.01, z = 0.08, $p = .938$), self-deprecation ($\beta = 0.01$, SE = 0.01, z = 1.25, $p = .213$), and difference-loneliness ($\beta = 0.002$, SE = 0.01, z = 0.22, $p = .825$) schemas were not statistically significant. Taken together, results suggest that greater sexual dysfunction was, as predicted, associated with increased perceptions of pain in ambiguous faces, and that this effect was carried through helplessness sexual schemas.

Post hoc Hypothesis 2: Sexual dysfunction schemas mediate the associations between sexual dysfunctions and pain primed RTs. To examine whether the relationship between sexual dysfunction and ratings of pain in sexual faces was carried through sexual dysfunction schemas, a series of five repeated measures, hierarchical mediation analyses were conducted. The multilevel moderated mediation model was estimated using robust maximum likelihood estimation (MLR) with clustered standard errors (clusters = 150 participants). Covariates (i.e., hours of pornography use, age, glasses use, computer platform, TBI history, use of erectile dysfunction medications, and sexual frequency, hours of video game use) were included in level 2 of the model. The full mediation outcome regressions for each model predicting pain face RTs are reported in Table 15.

Significant indirect effects emerged for four of the five schemas as mediator models (see Figures 25-28). In the model with undesirability/rejection schemas, greater sexual dysfunction

significantly predicted greater severity in undesirability/rejection sexual schemas ("*a"* pathway*;* β = 0.45, SE = 0.02, z = 21.39, $p < .001$), and greater undesirability/rejection sexual schemas, as predicted, was significantly associated with faster RTs to locate probes primed with pain faces ("*b"* pathway*;* β = -0.09, SE = 0.01, z = -4.60, $p < .001$). However, the total effect ("*c"* pathway*;* β = 0.09, SE = 0.01, z = 4.25, $p < .001$) and direct effect ("*c'"* pathway*;* β = 0.14, SE = 0.01, z = 5.64, $p < .001$) of sexual dysfunction significantly predicted greater pain face latencies. Thus, the indirect effect of sexual dysfunction on perceptions of pain in ambiguous faces carried through undesirability/rejection schemas was negative, which means that sexual schemas suppressed the total effect of sexual dysfunction and RT latencies to locate pain primed probes (indirect effect pathway*;* β = -0.04, SE = 0.004, z = -4.446, $p < .001$). The pattern of results found for undesirability/rejection schemas was replicated with incompetence, self-deprecation, and difference-loneliness. The results associated for the various models and corresponding pathways are reported in Table 15 and need not be reiterated here. Finally, hierarchical mediation analyses were conducted to evaluate the mediating effect of sexual dysfunction schemas on the relationship between sexual dysfunction and neutral face RTs. Table 16 reports the results for these analyses, which yielded identical patterns surfaced regarding the suppression of the total effect of sexual dysfunction and neutral face RTs due to the indirect (negative) effect of undesirability/rejection, incompetence self-deprecation, and difference-loneliness schemas on the relationship between sexual dysfunction and neutral face RTs.

CHAPTER 4: DISCUSSION

4.1 A Priori Hypotheses

The study investigated whether sexual dysfunction schemas mediated the relationship between sexual dysfunction and the perception and interpretation of pain in sexual contexts, and whether these effects were moderated by the presentation of sexual prime stimuli. Part 1 examined whether sexual dysfunction was associated with perceiving pain in ambiguous orgasm faces and whether this association was mediated by sexual dysfunction schemas and moderated by prime condition. In Part 2, the focus shifted to attentional biases, testing whether sexual dysfunction predicted faster RTs to pain expressions in a dot-probe task, and whether this relationship was mediated by sexual dysfunction and moderated by prime condition. Both Part I and Part II employed a hierarchical moderated mediation framework to determine if the presence of sexual stimuli altered the strength of the mediational effects linking sexual dysfunction to negative cognitive responses.

In Part I, participants completed repeated-measures trials in which they first viewed a sexual or neutral prime, then rated the extant to which they perceived pain in ambiguous facial expressions of individuals experiencing orgasm. We hypothesized that participants reporting higher levels of sexual dysfunction would also endorse more severe sexual dysfunction schemas and perceive greater pain in the ambiguous faces. Furthermore, we expected this indirect effect of sexual dysfunction schemas on the association between sexual dysfunction and perceived pain to be conditional, with participants primed by sexual stimuli reporting significantly higher pain perceptions.

In Part II, participants again underwent repeated-measures trials with either a sexual or neutral prime, but this time completed a dot-probe task to identify whether a probe replaced a pain face or a neutral face target image. We hypothesized that individuals with higher levels of sexual

dysfunction would endorse more severe sexual dysfunction schemas and respond more quickly when the probe replaced a pain face. As with Part I, we expected the indirect effect of sexual dysfunction schemas to be conditional, resulting in faster RTs under sexual (versus neutral) prime conditions.

Contrary to the first hypothesis, the results did not support the prediction that the relationship between sexual dysfunction and perceptions of pain in ambiguous sexual faces would be mediated by sexual schemas – moderated by sexual stimulus primes. Contrary to the second hypothesis, results did not reveal any significant moderated mediation effects on the association between sexual dysfunction and latency to locate probes primed with pictures of faces expressing pain. That is, the hypothesized effect of sexual dysfunction on pain face RTs was not mediated by sexual schemas – moderated by sexual stimulus primes. These results contradict the theory that dysfunctional sexual schemas primed by sexual stimuli direct attention towards negative stimuli.

However, though none of the conditionally mediated effects predicted under the second hypothesis were statistically significant, the moderated-mediation contrast analyses revealed significant indirect effects for three of the five sexual schemas: Undesirability/Rejection, Incompetence, and Self-Deprecation – at both the sexual and neutral level of the prime condition. These results suggested that sexual dysfunction schemas may nonetheless function as a mechanism through which men with sexual dysfunction direct and allocate attentional resources in sexual situations. However, it should be noted that the effect of sexual dysfunction schemas significantly mediated the effect of sexual dysfunction and speed of reaction to probes replacing neutral probes also – leaving questions regarding a potential general vigilance toward visual stimuli facilitated by sexual dysfunction schemas, or an influence of spillover effect from trials using sexual primes.

Give the likely mediating role of sexual schemas despite insignificant conditional indirect effects, moderators were removed from the model and simple repeated measures mediation analyses were conducted. Correspondingly, primes were removed from analyses testing the role of

sexual dysfunction pain face interpretations. Moreover, the sexual versus neutral prime moderator was also removed from analyses testing the role of sexual dysfunction on attentional processes, while running two analyses separately for RT probes primed with pain and emotionally neutral faces. Although these analyses were redundant to some extant given the conditional mediation models conducted in the primary analyses, these post hoc analyses were conducted to confirm that, without the inclusion of prime moderators, the mediating effect of sexual schemas on interpretations of pain in ambiguous faces remained significant while significantly mediating attentional resources in the RT task.

Two contrasting scenarios may explain the lack of significant interactions between sexual schemas and the sexual vs neutral priming manipulation. On the one hand, it could be that the manipulation was not strong enough to sexually and differentially activate sexual schemas. This is however unlikely because the manipulation of showing pictures of couples having sex is commonly and successfully used in sexual-arousal reactivity research (e.g., Janssen et al., 2000) and participants reported sexual stimuli as being significantly more arousing than neutral stimuli in post-experimental ratings of prime stimuli.

A second possible scenario is that the null effects falsify current theories of the cognitive mechanisms that activate sexual schemas in heterosexual men with sexual dysfunction. Beck (2019) suggested that schemas can be activated in the presence of stimuli congruent with the content of the schema. Furthermore, anxious individuals tend to possess a vigilance toward stimuli which confirm their negatively biased beliefs (Mogg & Bradley, 2000). Applied to sexual context, men with sexual dysfunction tend to possess anxious concerns regarding their ability to perform sexually (Barlow, 1986; Weigel et al., 2007). Based in classical conditioning theory (Clark, 2005), it is plausible that repeated pairings of sexual stimuli and sexual dysfunction could lead sexual stimuli to develop into a conditioned stimulus that predicts dysfunctional schema activation and in turn symptoms of sexual dysfunction. Nobre (2010) provides initial support that sexual stimuli may

serve as schema-congruent information that in turn would activate sexual dysfunction schemas. Specifically, Nobre (2010) found that past unsuccessful sexual experiences predicted a greater risk of developing a "sexual dysfunction" schema comprised by thoughts that one is incompetent, helpless, unworthy of love, etc. Consequently, we proposed that sexual stimuli would activate sexual dysfunction schemas due to the pairing of said stimuli with unsuccessful sexual experiences.

While sexual and neutral stimuli differ markedly in arousal potential, mere exposure to sexual content may not directly trigger sexual-dysfunction schemas. For example, Prause and Pfaus (2015) found that although men with psychogenic erectile dysfunction reported difficulty with partnered sex, greater hours of pornography use were linked to increased self-reported sexual arousal—and showed no direct association with erectile dysfunction itself. These null findings underscore that cognitively processing sexual stimuli alone does not necessarily elevate the risk of sexual dysfunction.

In contrast, increased pornography use was associated with higher endorsement of negative sexual schemas—specifically Undesirability/Rejection, Incompetence, Self-Deprecation, and Helplessness. This suggests that it is not the sexual stimuli per se, but rather how individuals interpret and internalize these stimuli (e.g., upward comparisons with unrealistic body ideals) that activates maladaptive schemas. Indeed, men who view their own anatomy as falling short of pornographic norms tend to develop feelings of inadequacy and rejection (Modaini et al., 2002). While the precise timing of schema formation, pornography exposure, and sexual-dysfunction onset remains unclear—and beyond the scope of the present study—these findings highlight the role of cognitive–affective processing in linking sexual stimuli to negative self-beliefs.

Additional cognitive processes may explain why our sexual-stimulus primes did not systematically activate sexual-dysfunction schemas or alter pain perceptions and RTs. Although effective communication and facial expressions are important in partnered sex (Roels & Janssen, 2020; Fernández-Dols et al., 2011; Rupp & Wallen, 2007, 2009), men with sexual dysfunction

instead tend to monitor internal sensations and performance anxieties. This "spectatoring" behavior—viewing one's own performance from a self-critical, third-person perspective—has been linked to more severe dysfunction (Faith & Schaire, 2003) and is exacerbated by negative genital self-image and distractibility (Wyatt & de Jong, 2018, 2020). Such internal vigilance may narrow attention to symptoms of arousal failure (e.g., reduced penile rigidity) and misinterpret benign anxiety cues, thereby preferentially activating dysfunction schemas (Barlow, 1986, 2002). Our remote protocol precluded continuous measurement of arousal, but lab-based tools like the "arousometer" (Rellini et al., 2005) capture real-time concordance between subjective and physiological responses. Employing such measures in future work could illuminate how moment-to-moment arousal monitoring interacts with schema activation and influences both pain attribution to sexual faces and threat-related RTs.

4.2 Ancillary Analyses

The *post hoc* repeated measures hierarchical mediation analyses predicting the interpretation of pain in ambiguous faces revealed that, when removing the moderator from the model, only helplessness sexual schemas significantly mediated a positive association between sexual dysfunction and pain scores. However, although the indirect effect was statistically significant, and though the direct effect of sexual dysfunction on pain interpretations was diminished when accounting for the indirect effect of helplessness schemas, the direct effect remained significant – suggesting partial mediation of helplessness schemas.

The second set of *post hoc* repeated measures hierarchical mediation analyses revealed that four sexual schemas (Undesirability/Rejection, Incompetence, Self-deprecation, and Difference-loneliness) significantly mediated associations between sexual dysfunction and RTs in both prime probe conditions. Surprisingly, although it was predicted that the total and direct effects of sexual dysfunction on both pain and neutral face RTs would indicate faster RTs for pain than neutral-

primed probes, the mediation analyses revealed a positive relationship between sexual dysfunction RT latencies regardless of type of primed probe. Interestingly, the relationship between sexual schemas and RTs was negative, which yielded the indirect effect negative. In addition, the direct effect of sexual dysfunction was greater than its corresponding total effect. This would suggest that Undesirability/Rejection, Incompetence, Self-Deprecation, and Difference-Loneliness schemas do not operate as traditional mediators — instead, they function as suppressor variables, removing variance in sexual dysfunction scores that is unrelated to recognition of pain faces and thus unmasks a stronger direct link between sexual dysfunction and attention to negative stimuli. Specifically, by partialing out variance in sexual dysfunction that was tied up in Undesirability/Rejection, Incompetence, Self-Deprecation, and Difference-Loneliness schemas, the direct slowing effect of sexual dysfunction on pain face and neutral face RTs became even stronger than the total effect. In other words, once you control for these negative schemas, higher sexual dysfunction predicts slower pain-face and neutral- face responses more powerfully, while the mediated (indirect) pathway through the schemas predicts faster responses. This pattern, underscores how certain cognitive–affective frameworks can both accelerate and clarify the true impact of sexual dysfunction on attention resource allocation.

Evidence of a suppression effect warrants speculation regarding what additional cognitive factors may influence the effect of sexual dysfunction on pain face interpretations and RTs which are not accounted for by sexual dysfunction schemas. The literature on associations between emotion regulation and sexual dysfunction may provide answers to this question. Considering that sexual arousal is described as an emotional response in prominent theories of human sexuality (e.g., Spiering & Everaerd, 2007), it should come as no surprise that the accurate interpretation of one's partner's emotional sexual experience plays a vital role in the cognitive processes which facilitate sexual function (Overveld & Borg, 2015; Dubé, Corsini-Munt, Muise, and Rosen, 2019). It could be that individuals with sexual dysfunction possess deficits in emotional awareness, which in turn

leads to more erroneous negative interpretations of their partner's facial expressions and increase their awareness of potential threat to their sexual arousal during sex. However, literature in this area is still developing, and thus these associations remain speculative. Future studies would benefit from the inclusion of measures of additional cognitive factors in understanding associations between sexual dysfunction and interpretations of pain in ambiguous faces and reaction toward threat stimuli.

In our hierarchical mediation, sexual dysfunction (X) was positively associated with reaction-time latencies (Y) — men with greater dysfunction were slower overall — but sexual-dysfunction schemas (M) were negatively associated with Y (more pronounced sexual dysfunction schema severity predicted faster responses). Because X positively predicts M while M negatively predicts Y, the product $a \times b$ is negative, and including M in the model increases the direct effect of X on Y ($c' > c$). This observed relationship illustrates a textbook example of a classical suppression effect: schemas "suppress" the component of sexual dysfunction that facilitates faster responding (via schema-driven hypervigilance), thereby revealing a stronger true slowdown effect of sexual dysfunction itself (see Yaeger et al. (1998). Why might schemas speed responses? One possibility—drawn from emotion-regulation theories (Barlow, 2002) and threat-vigilance research (Beck & Clark, 1988; Knyazev et al., 2006)—is that schema activation reflects an internal hypervigilance process. Men high in sexual dysfunction may "spectate" their performance and scan for signs of arousal failure, creating a state of general alertness that accelerates probe detection (even if it doesn't improve overall task performance). Thus, the schemas remove variance in sexual dysfunction associated with this rapid, anxiety-driven alertness, leaving behind the slower, performance-impairment component of sexual dysfunction. These findings add to the extant literature and expand upon Janssen et al. (2000)'s conceptualization of sexual function as possessing fast, bottom-up and slow/deliberate top-down cognitive processes. Restated, the findings suggest two co-occurring cognitive processes:

1. A schema-mediated hypervigilance that speeds responses (negative indirect pathway).
2. A direct impairment of cognitive-motor performance by sexual dysfunction that slows responses (positive direct pathway).

Because the mediating schemas carry the speeding component, controlling for them via the suppression effect amplifies the observed slowing in the direct c' path. Future studies should include measures of threat sensitivity, emotion-regulation deficits, and attentional control to test this dual-process account.

4.3 Limitations and Future Directions

Findings from the study should be interpretated with regard for its methodological limitations. This study was designed to test the effect that sexual dysfunction schemas primed with sexual contexts influence the way individuals with sexual dysfunction interpret emotions in sexual faces and their vigilance negative visual stimuli. Considering these non-significant findings, a few methodological limitations may have inhibited the experiment's ability to observe a significant priming effect. First, it is possible that sexual stimuli do not adequately activate sexual schemas. What we do not know is whether different primes may increase the availability of sexual dysfunction schemas and in turn influence the perceptions of pain in sexual faces or reaction to confirmatory, arousal-threatening (i.e., faces conveying pain) stimuli. Studies on mood induction suggest the use of guided imagery vignettes to elicit desired mood states in both laboratory (Mayer, Allen, & Beauregard, 1995) and virtual settings (Marcusson-Clavertz et al., 2019). Similarly, the QCSASC (Nobre, 2010) asks participants to read a sexual dysfunction vignette and determine which of these vignettes they most closely identify with, prior to answering schema-specific questions. The vignettes themselves may sufficiently prime sexual schemas to be activated in a laboratory setting, However, considering that questionnaires were asked after the conclusion of experimental trials, the currently study precludes the ability to answer whether the presence or

absence of a schema vignette may conditionally influence the indirect effect of sexual dysfunction schemas on associations between sexual dysfunction, negative interpretations of sexual faces and vigilance toward faces conveying pain.

Additionally, spill-over effects may have artificially eclipsed the true conditional indirect effects of sexual primes. For experimental trials in both phases of the experiment, the repeated trials were counterbalanced so though in each trial there was a balanced chance that the trial would utilize a sexual prime or a neutral prime. Consequently, there may exist a significant effect of sexual primes on pain face interpretations and reaction times, but the effect may have continued to exert its influence during a proceeding trial with a neutral prime, resulting in non-significant differences in pain face perceptions and reaction times between sexual and neutral prime conditions. Correspondingly, future studies would benefit from administering repeated measures which cluster trials based on prime type or assigning some participants to control conditions which do not utilize sexual primes for the repeated measures trials.

Moreover, the pre-screening design may have inadvertently primed participants with a sexual context and in turn activating – for all trials - the cognitive processes unique to sexual contexts. Specifically, participants were screened for level of sexual dysfunction severity prior to completing the experimental tasks of the study to assess a sample of men with varying degrees of sexual dysfunction. Unfortunately, asking participants about several questions about their "sexual function over the last 6 months" may have unintendedly activated sexual dysfunction schemas an influenced their ratings and reaction times. Though pre-screening can aid in cost-effectiveness and efficiency in data collection, future studies should consider ways to acquire a representative sample while being mindful of the various ways in which sample selection may introduce unintended error.

Furthermore, though this study did address some of the methodological limitations underscored by Wyatt (2023) which called for assessing these responses in a sample of men with greater variability in severity of sexual dysfunction, the following study lacked the ability to

compare between men diagnosed with sexual dysfunction and healthy controls. While our sample was comprised of men with varying degrees of self-reported sexual difficulties, we caution making statements regarding categorically significant differences for men with and without sexual dysfunction. Future studies would benefit form a between-subjects design comparing, between men with and without sexual dysfunction, the mediating role of sexual dysfunction schemas primed by sexual contexts on links between sexual dysfunction and pain perception and negatively biased attention.

Finally, due to of the remote nature of the study, random error may have been introduced with regards to the way we measured our outcome variables of interest (i.e., ratings of pain in sexual faces, pain face RTs). Specifically, though measures were in place to ensure attentiveness (i.e., attention checks), the current study was not able to control for distracting factors (e.g., random noises, not actually having a private space, internet speed, notifications popping up on one's screen, etc.) that could have pulled one's attention away from the task at and/or influenced the interpretations they made about the stimuli they were viewing. Future studies could benefit from a designated workstation in a laboratory setting to reduce the impact that this random error may have on associations between the constructs of interest.

4.5 Conclusions

This study tested whether sexual-dysfunction schemas mediate the relationship between self-reported sexual dysfunction and (a) the perception of pain in ambiguous orgasm faces and (b) attentional vigilance to pain versus neutral facial probes, under both sexual and neutral priming conditions. Contrary to our hypotheses, sexual primes did not significantly moderate either pathway: the indirect effects of dysfunction on pain perception and RTs were statistically equivalent under sexual and neutral primes.

However, ancillary analyses—omitting the priming moderator—revealed robust suppression effects for several schemas. In the pain-perception task, helplessness schemas suppressed irrelevant variance in dysfunction scores, elucidating a stronger direct link between sexual dysfunction and perceived pain in ambiguous sexual faces. In the dot-probe task, four schemas (Undesirability/Rejection, Incompetence, Self-Deprecation, Difference-Loneliness) also acted as suppressors: they carried a schema-driven hypervigilance component (speeding responses), while the residual sexual dysfunction variance predicted slower RTs more powerfully. Taken together, these findings suggest a dual-process model in which sexual dysfunction simultaneously (1) impairs cognitive-motor performance (slowing responses) and (2) triggers an anxiety-driven hypervigilance (speeding detection via schemas).

Clinically, these dynamics underscore the importance of assessing not only global dysfunction but also patients' underlying cognitive–affective schemas. Interventions targeting maladaptive schemas (e.g., helplessness, undesirability/rejection) may both alleviate distress and clarify the true impact of dysfunction on sexual-context processing. Future work should incorporate continuous measures of subjective sexual arousal (e.g., arousometer; Rellini & Meston, 2005), emotion-regulation and hypervigilance assessments, and between-person experimental priming methods (e.g., schema-congruent vignettes) to more precisely map how internal cognitive factors drive negative interpretations and attentional biases in men with sexual dysfunction. Nonetheless, the current study adds to the extant body of literature and suggests a nuanced, dual-process conceptualization of sexual stimulus perception.

APPENDIX

Tables

Table 1. Participant Demographic information

Demographic	%
Race	
White	64.1
Black/ African American	19.9
American Indian or Alaskan Native	1.9
Chinese	1.9
Vietnamese	0.6
Filipino	1.9
Korean	1.3
Asian Indian	1.3
Other Asian	1.3
Native Hawaiian	0.0
Samoan	0.0
Chamorro	0.6
Other Pacific Islander	5.1
Other	0.1
Degree	
No High School Diploma	1.3
High School Diploma	20.5
Some College, Trade school, AA Degree	26.3
BA or BS Degree	30.1
MA or MS Degree	19.9
Ph.D, Psy.D, DDS, M.D, or Law Degree	1.9

Relationship Status	
No Sexual or Romantic Involvement	3.2
Sexually Involved, not dating	19.9
Dating, Not Exclusively Committed	13.5
Dating, Exclusively Committed	17.9
Engaged	4.5
Married	41.1

Table 2. *Pearson correlations, means, and standard deviations*

		M	SD	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1.	Sexual Dysfunction	2.03	0.91	.051	.136	.174*	.187*	.142	.409**	.458**	.383**	.279**	.398**	.054	.049	.085
2.	Pain Ratings	2.18	0.49		.205*	.238**	.198*	.210**	.058	.084	.128	.070	.130	.093	.202*	.323**
3.	Sex-Pain RT	545.86	179.95			.922**	.927**	.878**	-.070	-.004	-.096	-.030	.067	.218**	.019	-.038
4.	Sex-Neutral RT	553.89	185.64				.933**	.885**	.039	.064	>.001	.083	.135	.221**	.038	.077
5.	Neutral-Pain RT	540.84	181.33					.900**	.014	.073	-.024	.064	.104	.204*	.063	.056
6.	Neutral-Neutral RT	558.33	192.85						-.020	.051	-.042	.027	.100	.144	.092	.009
7.	Undesirability/Reiection Schema	17.59	8.82							.863**	.898**	.812**	.833**	-.054	-.032	.185*
8.	Incompetence Schema	17.82	8.56								.844**	.692**	.828**	-.026	-.005	.207**
9.	Self-deprecation Schema	6.19	3.24									.711**	.785**	-.036	-.061	.202*
10.	Difference-loneliness	7.79	3.16										.753**	-.027	-.026	.151
11.	Helplessness Schema	9.19	3.85											-.008	-.059	.219**
12.	Sexual Frequency	8.58	7.71												.013	.077
13.	Hours Video Games	15.97	10.64													.337**
14.	Hours Porn Use	6.05	7.54													

*Note. RT = RT, measured in milliseconds; * p < .05, ** p <.01*

Table 3. *Anderson-Darling Tests of Univariate Normality – Experiment 1*

Variable	Statistic
Pain Rating	113.65***
Undesirability/Rejection	61.70***
Incompetent	48.19***
Self-Deprecate	81.32***
Difference Loneliness	22.39***
Helpless ness	27.03***
Sexual Dysfunction	41.59***
Hours of Porn Use	164.60***
Sexual Frequency	85.75***
Age	50.33***
Computer	307.94***
ED Medication	487.52***

Note. *** = $p < .001$

Table 4. *Anderson-Darling Tests of Univariate Normality – Experiment 2*

Variable	Statistic
RT	210.26***
Undesirability/Rejection	144.10***
Incompetent	126.78***
Self-Deprecate	202.68***
Difference Loneliness	56.79***
Helpless ness	68.94***
Sexual Dysfunction	120.55***
Hours of Porn Use	378.69***
Sexual Frequency	244.12***
Age	126.17***
Computer	744.65***
ED Medication	1230.48***
Video Game Use (hrs.)	59.11***

Note. *** = $P < .001$.

Table 5. *VIF for Experiment 1 Predictors*

Predictor	VIF	Tolerance
1. Undesirability/Rejection Schema		
Sexual Dysfunction	1.52	0.66
Prime	1.00	1.00
Age	1.04	0.97
Hours of Porn Use	1.10	0.91
Sexual Frequency	1.05	0.95
ED Medication	1.48	0.67
Computer Platform	1.08	0.93
Wearing Glasses Now	1.15	0.87
TBI	1.19	0.84
Undesirability/Rejection * Prime	2.00	0.50
2. Incompetence Schema		
Sexual Dysfunction	1.51	0.66
Prime	1.00	1.00
Age	1.03	0.97
Hours of Porn Use	1.10	0.91
Sexual Frequency	1.05	0.95
ED Medication	1.47	0.68
Computer Platform	1.08	0.93
Wearing Glasses Now	1.15	0.87
TBI	1.16	0.86
Incompetence * Prime	2.00	0.50
3. Self-Deprecate Schema		
Sexual Dysfunction	1.50	0.67
Prime	1.00	1.00
Age	1.03	0.97
Hours of Porn Use	1.11	0.90
Sexual Frequency	1.05	0.95
ED Medication	1.49	0.67
Computer Platform	1.08	0.93
Wearing Glasses Now	1.15	0.87
TBI	1.18	0.85
Self-Deprecate * Prime	2.00	0.50
4. Difference-Loneliness Schema		
Sexual Dysfunction	1.40	0.71
Prime	1.00	1.00
Age	1.04	0.96

Hours of Porn Use	1.09	0.92
Sexual Frequency	1.05	0.95
ED Medication	1.47	0.68
Computer Platform	1.08	0.93
Wearing Glasses Now	1.16	0.87
TBI	1.14	0.88
Difference-Loneliness * Prime	2.00	0.50
5. Helplessness Schema		
Sexual Dysfunction	1.44	0.69
Prime	1.00	1.00
Age	1.03	0.97
Hours of Porn Use	1.11	0.90
Sexual Frequency	1.05	0.95
ED Medication	1.47	0.68
Computer Platform	1.08	0.93
Wearing Glasses Now	1.16	0.86
TBI	1.16	0.87
Helpless * Prime	2.00	0.50

Table 6. *VIF for Experiment 2 Predictors*

Predictor	VIF	Tolerance
1. Undesirability/Rejection Schema		
Sexual Dysfunction	1.52	0.66
Prime	1.00	1.00
Age	1.04	0.97
Hours of Porn Use	1.10	0.91
Sexual Frequency	1.05	0.95
ED Medication	1.48	0.67
Computer Platform	1.08	0.93
Wearing Glasses Now	1.15	0.87
TBI	1.19	0.84
Undesirability/Rejection * Prime	2.00	0.5
2. Incompetence Schema		
Sexual Dysfunction	1.51	0.66
Prime	1.00	1.00
Age	1.03	0.97
Hours of Porn Use	1.10	0.91
Sexual Frequency	1.05	0.95
ED Medication	1.47	0.68
Computer Platform	1.08	0.93
Wearing Glasses Now	1.15	0.87
TBI	1.16	0.86
Incompetent * Prime	2.00	0.50
3. Self-Deprecation Schema		
Sexual Dysfunction	1.5	0.67
Prime	1.00	1.00
Age	1.03	0.97
Hours of Porn Use	1.11	0.90
Sexual Frequency	1.05	0.95
ED Medication	1.49	0.67
Computer Platform	1.08	0.93
Wearing Glasses Now	1.15	0.87
TBI	1.18	0.85
Self-Deprecation * Prime	2.00	0.50
4. Difference-Loneliness Schema		
Sexual Dysfunction	1.40	0.71
Prime	1.00	1.00
Age	1.04	0.96

Hours of Porn Use	1.09	0.92
Sexual Frequency	1.05	0.95
ED Medication	1.47	0.68
Computer Platform	1.08	0.93
Wearing Glasses Now	1.16	0.87
TBI	1.14	0.88
Difference-Loneliness * Prime	2.00	0.50
5. Helplessness Schema		
Sexual Dysfunction	1.44	0.69
Prime	1.00	1.00
Age	1.03	0.97
Hours of Porn Use	1.11	0.90
Sexual Frequency	1.05	0.95
ED Medication	1.47	0.68
Computer Platform	1.08	0.93
Wearing Glasses Now	1.16	0.86
TBI	1.16	0.87
Helplessness * Prime	2.00	0.50

Table 7. *Breusch Pagan Tests of Homoscedasticity for Experiment 1*

Schema	BP χ^2 (df)	*P*
Undesirability/Rejection	431.91 (11)	< .001
Incompetence	434.03 (11)	< .001
Self-Deprecation	429.90 (11)	< .001
Difference-Loneliness	429.73 (11)	< .001
Helplessness	426.63 (11)	< .001

Table 8. *Breusch Pagan Tests of Homoscedasticity for Experiment 2*

Schema	BP χ^2 (df)	*P*
Undesirability/Rejection	208.33 (15)	< .001
Incompetence	184.46 (15)	< .001
Self-Deprecation	206.27 (15)	< .001
Difference-Loneliness	186.80 (15)	< .001
Helplessness	184.77 (15)_	< .001

Table 9. *Mardia's Test of Skewness and Kurtosis*		
Test	Statistic	*P*
1. Experiment 1		
Skewness	4708.34	< .001***
Kurtosis	5367.60	< .001***
2. Experiment 2		
Skewness	13405.70	< .001***
Kurtosis	14537.34	< .001***

Table 10. *Moderated Mediation Analyses for Experiment Perceptions of Pain in Ambiguous Faces*

Model 1. Conditional Indirect Effect of Undesirability/Rejection Schema						
Outcome		Predictor	*β*	SE	Z	*P*
Schema	~	Sexual Dysfunction	0.42	0.02	18.21	< .001***
Schema	~	Hours of Porn Use	0.13	0.02	7.53	< .001***
Schema	~	Age	-0.06	0.004	-2.83	.005**
Schema	~	Wearing Glasses Now	0.06	0.03	2.93	.003**
Schema	~	Platform	0.01	0.01	0.61	.543
Schema	~	TBI	-0.21	0.05	-12.01	< .001***
Schema	~	ED Medication Use	0.09	0.06	3.68	< .001***
Schema	~	Sexual Frequency	-0.01	0.02	-0.66	.508
Rating	~	Sexual Dysfunction	-0.08	0.01	-3.10	.002**
Rating	~	Primes	-0.01	0.02	-0.33	.741
Rating	~	Schema	0.02	0.01	0.59	.554
Rating	~	Schema * Primes	-0.01	0.02	-0.21	.832
Rating	~	Hours Of Porn Use	0.20	0.01	9.39	< .001***
Rating	~	Age	0.03	0.002	1.40	.163
Rating	~	Wearing Glasses Now	-0.02	0.02	-1.01	.313
Rating	~	Computer Platform	-0.18	0.01	-9.21	< .001***
Rating	~	TBI	0.03	0.03	1.13	.258
Rating	~	ED Medication Use	0.02	0.03	0.82	.410
Rating	~	Sexual Frequency	0.03	0.01	1.17	.242
Model 2. Conditional Indirect Effect of Incompetence Schema						
Outcome		Predictor	*β*	SE	Z	*P*
Schema	~	Sexual Dysfunction	0.41	0.02	17.16	< .001***
Schema	~	Hours of Porn Use	0.15	0.02	8.62	< .001***
Schema	~	Age	0.03	0.00	1.76	0.078
Schema	~	Wearing Glasses Now	0.01	0.03	0.68	0.496
Schema	~	Platform	-0.05	0.01	-2.63	0.008**
Schema	~	TBI	-0.15	0.05	-8.29	< .001***
Schema	~	ED Medication Use	-0.03	0.06	-1.03	0.301
Schema	~	Sexual Frequency	-0.01	0.02	-0.51	0.613
Rating	~	Sexual Dysfunction	-0.09	0.01	-3.30	< .001***
Rating	~	Primes	-0.01	0.02	-0.33	.739
Rating	~	Schema	0.00	0.01	0.08	.938
Rating	~	Schema * Primes	0.001	0.02	0.04	.967
Rating	~	Hours Of Porn Use	0.20	0.01	9.33	< .001***
Rating	~	Age	0.03	0.002	1.37	.170
Rating	~	Wearing Glasses Now	-0.02	0.02	-0.97	.331

Rating	~	Computer Platform	-0.18	0.01	-9.16	< .001***
Rating	~	TBI	0.02	0.03	1.03	.302
Rating	~	ED Medication Use	0.02	0.03	0.88	.379
Rating	~	Sexual Frequency	0.03	0.01	1.16	.246

Model 3. Conditional Indirect Effect of Self-Deprecation Schema

Outcome		Predictor	*β*	SE	Z	*P*
Schema	~	Sexual Dysfunction	0.40	0.02	16.85	< .001***
Schema	~	Hours of Porn Use	0.16	0.02	7.21	< .001***
Schema	~	Age	0.02	0.00	1.07	0.283
Schema	~	Wearing Glasses Now	0.05	0.03	2.42	0.016*
Schema	~	Platform	0.00	0.01	0.09	0.931
Schema	~	TBI	-0.19	0.05	-10.71	< .001***
Schema	~	ED Medication Use	0.12	0.06	4.76	< .001***
Schema	~	Sexual Frequency	0.00	0.02	0.24	0.811
Rating	~	Sexual Dysfunction	-0.08	0.01	-2.84	.005**
Rating	~	Primes	-0.01	0.02	-0.33	.739
Rating	~	Schema	0.03	0.01	1.25	.211
Rating	~	Schema * Primes	0.00	0.02	0.01	.995
Rating	~	Hours Of Porn Use	0.20	0.01	9.02	< .001***
Rating	~	Age	0.03	0.002	1.34	.180
Rating	~	Wearing Glasses Now	-0.02	0.02	-1.04	.297
Rating	~	Computer Platform	-0.18	0.01	-9.20	< .001***
Rating	~	TBI	0.03	0.03	1.29	.198
Rating	~	ED Medication Use	0.02	0.03	0.73	.467
Rating	~	Sexual Frequency	0.03	0.01	1.15	.249

Model 4. Conditional Indirect Effect of Difference-Loneliness Schema

Outcome		Predictor	*β*	SE	Z	*P*
Schema	~	Sexual Dysfunction	0.31	0.03	11.98	< .001***
Schema	~	Hours of Porn Use	0.10	0.02	5.40	< .001***
Schema	~	Age	-0.07	0.00	-3.67	< .001***
Schema	~	Wearing Glasses Now	0.07	0.03	3.12	.002**
Schema	~	Platform	0.05	0.02	2.47	.014*
Schema	~	TBI	-0.07	0.06	-3.21	.001***
Schema	~	ED Medication Use	0.05	0.06	1.93	.053
Schema	~	Sexual Frequency	0.01	0.02	0.46	.647
Rating	~	Sexual Dysfunction	-0.09	0.01	-3.43	< .001***
Rating	~	Primes	-0.01	0.02	-0.34	.737
Rating	~	Schema	0.01	0.01	0.22	.825
Rating	~	Schema * Primes	0.01	0.02	0.38	.705

Rating	~	Hours Of Porn Use	0.20	0.01	9.58	< .001***
Rating	~	Age	0.03	0.002	1.37	.170
Rating	~	Wearing Glasses Now	-0.02	0.02	-0.98	.325
Rating	~	Computer Platform	-0.18	0.01	-9.23	< .001***
Rating	~	TBI	0.02	0.0	1.05	.295
Rating	~	ED Medication Use	0.02	0.03	0.87	.384
Rating	~	Sexual Frequency	0.03	0.01	1.16	.248

Model 5. Conditional Indirect Effect of Helplessness Schema

Outcome		Predictor	*β*	SE	Z	*P*
Schema	~	Sexual Dysfunction	0.35	0.02	14.79	< .001***
Schema	~	Hours of Porn Use	0.16	0.02	9.02	< .001***
Schema	~	Age	-0.04	0.00	-2.13	.033*
Schema	~	Wearing Glasses Now	-0.08	0.03	-4.05	<.001***
Schema	~	Platform	-0.03	0.01	-1.37	.170
Schema	~	TBI	-0.14	0.06	-6.93	< .001***
Schema	~	ED Medication Use	0.05	0.06	1.89	.059
Schema	~	Sexual Frequency	-0.03	0.02	-1.95	.052
Rating	~	Sexual Dysfunction	-0.07	0.01	-2.57	.01**
Rating	~	Primes	-0.01	0.02	-0.34	.738
Rating	~	Schema	0.06	0.01	2.33	.020*
Rating	~	Schema * Primes	0.002	0.02	0.07	.941
Rating	~	Hours Of Porn Use	0.19	0.01	8.89	< .001***
Rating	~	Age	0.03	0.002	1.49	.137
Rating	~	Wearing Glasses Now	-0.02	0.02	-0.77	.444
Rating	~	Computer Platform	-0.18	0.01	-9.09	< .001***
Rating	~	TBI	0.03	0.03	1.40	.160
Rating	~	ED Medication Use	0.02	0.03	0.77	.442
Rating	~	Sexual Frequency	0.03	0.01	1.25	.210

*Note. * = p < 05, ** = p < .01, *** = p < .001*

Table 11. *Moderated Mediation Pain Face Contrasts for Experiment 1*

Predictor	*β*	SE	Z	*P*
Model 1. Conditional Indirect Effect of Rejection Schema				
Neutral Prime Indirect Effect	-0.01	0.01	-0.60	.546
Sexual Prime Indirect Effect	-0.01	0.01	-0.32	.751
Index of Moderated Mediation	0.003	0.01	0.22	.83
Model 2. Conditional Indirect Effect of Incompetence Schema				
Neutral Prime Indirect Effect	-0.001	0.01	-0.04	.97
Sexual Prime Indirect Effect	-0.001	0.01	-0.08	.934
Index of Moderated Mediation	-0.001	0.01	-0.04	.971
Model 3. Conditional Indirect Effect of Self-Deprecation Schema				
Neutral Prime Indirect Effect	-0.01	0.01	-0.97	.334
Sexual Prime Indirect Effect	-0.01	0.01	-0.95	.341
Index of Moderated Mediation	0.00	0.01	-0.01	.995
Model 4. Conditional Indirect Effect of Difference-Loneliness Schema				
Neutral Prime Indirect Effect	0.001	0.01	0.09	.926
Sexual Prime Indirect Effect	-0.003	0.01	-0.40	.688
Index of Moderated Mediation	-0.003	0.01	-0.38	.707
Model 5. Conditional Indirect Effect of Helplessness Schema				
Neutral Prime Indirect Effect	-0.02	0.01	-1.80	.072†
Sexual Prime Indirect Effect	-0.02	0.01	-1.77	.077†
Index of Moderated Mediation	-0.001	0.01	-0.07	.948

Note. † = trending significance

Table 12. *Conditional Indirect Effects of Sexual Dysfunction Schemas for Pain Face Reaction Times*

Model 1. Undesirability/Rejection Schema

Outcome		Predictor	*β*	SE	Z	*P*
Schema	~	Sexual Dysfunction	0.45	0.02	30.26	<.001***
Schema	~	Hours Of Porn Use	0.09	0.01	7.98	<.001***
Schema	~	Age	-0.06	0.003	-4.37	<.001***
Schema	~	Wearing Glasses Now	0.04	0.02	3.05	.002**
Schema	~	Platform	-0.01	0.01	-1.07	.286
Schema	~	TBI	-0.16	0.03	-14.15	<.001***
Schema	~	ED Medication Use	0.10	0.04	6.61	<.001***
Schema	~	Sexual Frequency	-0.01	0.01	-0.43	.670
Schema	~	Hours of Video Games	-0.10	0.01	-8.06	<.001***
RT	~	Sexual Dysfunction	0.13	0.01	7.33	<.001***
RT	~	Schema	-0.09	0.01	-3.23	.001***
RT	~	Prime	0.01	0.01	0.66	.511
RT	~	Probe	-0.003	0.01	-0.25	.803
RT	~	Schema * Prime	-0.01	0.01	-0.48	.634
RT	~	Schema * Probe	0.003	0.01	0.11	.915
RT	~	Schema * Prime * Probe	0.0003	0.02	-0.01	.989
RT	~	Hours of Porn Use	0.03	0.01	2.13	.034*
RT	~	Age	0.22	0.001	17.26	<.001***
RT	~	Wearing Glasses Now	0.14	0.01	10.13	<.001***
RT	~	Platform	-0.19	0.004	-14.25	<.001***
RT	~	TBI	-0.05	0.02	-3.78	<.001***
RT	~	ED Medication Use	-0.07	0.01	-4.57	<.001***
RT	~	Sexual Frequency	0.15	0.01	11.47	<.001***
RT	~	Hours of Video Games	0.01	0.01	0.29	.772

Model 2. Incompetence Schema

Outcome		Predictor	*β*	SE	Z	*P*
Schema	~	Sexual Dysfunction	0.42	0.02	27.05	<.001***
Schema	~	Hours Of Porn Use	0.13	0.01	10.90	<.001***
Schema	~	Age	0.04	0.003	3.27	.001***
Schema	~	Wearing Glasses Now	0.012	0.02	1.20	.229
Schema	~	Platform	-0.06	0.01	-5.21	<.001***
Schema	~	TBI	-0.11	0.04	-9.34	<.001***
Schema	~	ED Medication Use	-0.03	0.04	-2.15	.032*
Schema	~	Sexual Frequency	-0.002	0.01	-0.16	.873
Schema	~	Hours of Video Games	-0.12	0.02	-9.82	<.001***

RT	~	Sexual Dysfunction	0.12	0.01	7.51	<.001***
RT	~	Schema	-0.08	0.01	-2.96	.003**
RT	~	Prime	0.01	0.01	0.68	.497
RT	~	Probe	-0.003	0.01	-0.21	.830
RT	~	Schema * Prime	-0.02	0.01	-0.92	.357
RT	~	Schema * Probe	-0.003	0.01	-0.12	.904
RT	~	Schema * Prime * Probe	0.01	0.02	0.26	.796
RT	~	Hours of Porn Use	0.04	0.01	2.44	.015*
RT	~	Age	0.23	0.001	17.95	<.001***
RT	~	Wearing Glasses Now	0.14	0.01	10.04	<.001***
RT	~	Platform	-0.19	0.004	-14.53	<.001***
RT	~	TBI	-0.05	0.01	-3.50	<.001***
RT	~	ED Medication Use	-0.08	0.01	-5.46	<.001***
RT	~	Sexual Frequency	0.15	0.01	11.59	<.001***
RT	~	Hours of Video Games	0.002	0.01	0.13	.898

Model 3. Self-Deprecation Schema

Outcome		Predictor	*β*	SE	Z	*P*
Schema	~	Sexual Dysfunction	0.42	0.02	27.08	<.001***
Schema	~	Hours Of Porn Use	0.11	0.01	8.47	<.001***
Schema	~	Age	0.003	0.003	0.20	.841
Schema	~	Wearing Glasses Now	0.03	0.02	2.36	.018*
Schema	~	Platform	-0.03	0.01	-2.23	.026*
Schema	~	TBI	-0.11	0.03	-10.06	<.001***
Schema	~	ED Medication Use	0.12	0.04	7.78	<.001***
Schema	~	Sexual Frequency	0.02	0.01	1.58	.114
Schema	~	Hours of Video Games	-0.12	0.01	-10.47	<.001***
RT	~	Sexual Dysfunction	0.14	0.01	8.51	<.001***
RT	~	Schema	-0.14	0.01	-5.06	<.001***
RT	~	Prime	0.01	0.01	0.62	.536
RT	~	Probe	-0.004	0.01	-0.28	.782
RT	~	Schema * Prime	-0.02	0.01	-0.63	.530
RT	~	Schema * Probe	0.01	0.02	0.29	.771
RT	~	Schema * Prime * Probe	-0.002	0.02	-0.09	.927
RT	~	Hours of Porn Use	0.04	0.01	2.64	.008**
RT	~	Age	0.22	0.001	17.92	<.001***
RT	~	Wearing Glasses Now	0.14	0.01	10.26	<.001***
RT	~	Platform	-0.19	0.004	-14.55	<.001***
RT	~	TBI	-0.05	0.01	-3.96	<.001***

RT	~	ED Medication Use	-0.06	0.01	-4.08	<.001***
RT	~	Sexual Frequency	0.15	0.01	11.87	<.001***
RT	~	Hours of Video Games	-0.004	0.007	-0.255	.799

Model 4. Difference-Loneliness Schema

Outcome		Predictor	*β*	SE	Z	*P*
Schema	~	Sexual Dysfunction	0.34	0.02	21.34	<.001***
Schema	~	Hours Of Porn Use	0.07	0.01	5.96	<.001***
Schema	~	Age	-0.07	0.003	-5.41	<.001***
Schema	~	Wearing Glasses Now	0.06	0.02	4.43	<.001***
Schema	~	Platform	0.04	0.01	3.28	.001***
Schema	~	TBI	-0.04	0.04	-3.14	.002**
Schema	~	ED Medication Use	0.06	0.04	3.44	.001***
Schema	~	Sexual Frequency	0.02	0.01	1.27	.206
Schema	~	Hours of Video Games	-0.12	0.02	-8.13	<.001***
RT	~	Sexual Dysfunction	0.10	0.01	5.92	<.001***
RT	~	Schema	-0.02	0.01	-0.86	.389
RT	~	Prime	0.01	0.01	0.68	.497
RT	~	Probe	-0.003	0.01	-0.21	.838
RT	~	Schema * Prime	-0.03	0.01	-1.22	.223
RT	~	Schema * Probe	-0.01	0.01	-0.28	.782
RT	~	Schema * Prime * Probe	0.02	0.02	0.60	.551
RT	~	Hours of Porn Use	0.03	0.01	1.76	.079
RT	~	Age	0.22	0.001	17.30	<.001***
RT	~	Wearing Glasses Now	0.14	0.01	10.03	<.001***
RT	~	Platform	-0.18	0.004	-13.95	<.001***
RT	~	TBI	-0.04	0.01	-2.80	.005**
RT	~	ED Medication Use	-0.08	0.01	-5.01	<.001***
RT	~	Sexual Frequency	0.15	0.01	11.59	<.001***
RT	~	Hours of Video Games	0.01	0.01	0.59	.554

Model 5. Helplessness Schema

Outcome		Predictor	*β*	SE	Z	*P*
Schema	~	Sexual Dysfunction	0.36	0.02	24.69	<.001***
Schema	~	Hours Of Porn Use	0.16	0.01	12.43	<.001***
Schema	~	Age	-0.05	0.003	-4.05	<.001***
Schema	~	Wearing Glasses Now	-0.10	0.02	-7.94	<.001***
Schema	~	Platform	-0.04	0.01	-3.38	.001***
Schema	~	TBI	-0.11	0.04	-8.40	<.001***
Schema	~	ED Medication Use	0.04	0.04	2.54	.011*

Schema	~	Sexual Frequency	-0.03	0.01	-2.24	.025*
Schema	~	Hours of Video Games	-0.13	0.02	-9.23	<.001***
RT	~	Sexual Dysfunction	0.08	0.01	4.78	<.001***
RT	~	Schema	0.03	0.01	1.02	.309
RT	~	Prime	0.01	0.01	0.69	.493
RT	~	Probe	-0.002	0.01	-0.19	.851
RT	~	Schema * Prime	-0.03	0.01	-1.08	.282
RT	~	Schema * Probe	-0.01	0.01	-0.35	.723
RT	~	Schema * Prime * Probe	0.02	0.02	0.88	.381
RT	~	Hours of Porn Use	0.02	0.01	1.43	.153
RT	~	Age	0.22	0.001	17.53	<.001***
RT	~	Wearing Glasses Now	0.14	0.01	9.92	<.001***
RT	~	Platform	-0.18	0.004	-14.04	<.001***
RT	~	TBI	-0.03	0.02	-2.55	.011*
RT	~	ED Medication Use	-0.08	0.01	-5.20	<.001***
RT	~	Sexual Frequency	0.15	0.01	11.59	<.001***
RT	~	Hours of Video Games	0.02	0.01	1.00	.323

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

Table 13. *Conditional Indirect Effects Contrasts for Experiment 2*

Predictor	*β*	SE	Z	*P*
Model 1. Conditional Indirect Effect of Undesirability/Rejection Schema				
Neutral Prime Indirect Effect	-0.04	0.01	-3.00	.003**
Sexual Prime Indirect Effect	-0.04	0.01	-3.74	< .001***
Index of Moderated Mediation	-0.01	0.01	-0.49	.626
Model 2. Conditional Indirect Effect of Incompetence Schema				
Neutral Prime Indirect Effect	-0.04	0.004	-3.10	.002**
Sexual Prime Indirect Effect	-0.04	0.004	-3.86	< .001***
Index of Moderated Mediation	-0.01	0.01	-0.55	.583
Model 3. Conditional Indirect Effect of Self-Deprecation Schema				
Neutral Prime Indirect Effect	-0.05	0.004	-4.60	< .001***
Sexual Prime Indirect Effect	-0.06	0.004	-5.67	< .001***
Index of Moderated Mediation	-0.01	0.01	-0.75	.453
Model 4. Conditional Indirect Effect of Difference-Loneliness Schema				
Neutral Prime Indirect Effect	-0.01	0.003	-1.24	.215
Sexual Prime Indirect Effect	-0.02	0.003	-1.73	.084
Index of Moderated Mediation	-0.01	0.01	-0.36	.718
Model 5. Conditional Indirect Effect of Helplessness Schema				
Neutral Prime Indirect Effect	0.01	0.004	0.52	.603
Sexual Prime Indirect Effect	0.01	0.004	0.76	.449
Index of Moderated Mediation	-0.002	0.01	0.17	.867

*Note. * = p < 05, ** = p < .01, *** = p < .001*

Table 14. *Mediation Analyses for Experiment 1*

Path	*β*	SE	Z	*P*
Model 1. Helplessness Mediating Sexual Dysfunction and Pain Ratings				
a	0.35	0.03	14.80	< .001***
b	0.06	0.03	2.33	.825
c	0.09	0.03	3.66	< .001***
c′	0.07	0.03	2.57	.001***
indirect	0.02	0.01	2.27	.023*
Model 2. Rejection Mediating Sexual Dysfunction and Pain Ratings				
a	0.42	0.02	18.22	< .001***
b	0.02	0.03	0.59	.554
c	0.09	0.03	3.66	< .001***
c′	0.08	0.03	3.10	.002**
indirect	0.01	0.01	0.59	.555
Model 3. Incompetence Mediating Sexual Dysfunction and Pain Ratings				
a	0.41	0.02	17.16	< .001***
b	0.002	0.03	0.08	.938
c	0.09	0.03	3.66	< .001***
c′	0.09	0.03	3.30	< .001***
indirect	0.001	0.01	0.08	.938
Model 4. Self-Deprecation Mediating Sexual Dysfunction and Pain Ratings				
a	0.41	0.02	16.85	< .001***
b	0.03	0.03	1.25	.211
c	0.09	0.03	3.66	< .001***
c′	0.08	0.03	2.84	.005**
indirect	0.01	0.01	1.25	.213
Model 5. Difference-Loneliness Mediating Sexual Dysfunction and Pain Ratings				
a	0.31	0.03	11.98	< .001***
b	0.01	0.02	0.22	.825
c	0.09	0.03	3.66	< .001***
c′	0.09	0.03	3.43	< .001***
indirect	0.002	0.01	0.22	.825

*Note. * = p < 05, ** = p < .01, *** = p < .001*

Table 15. *Pain Face Mediation Analyses for Experiment 2*

Path	*β*	SE	Z	*P*
Model 1. Helplessness Mediating Sexual Dysfunction and Pain Face RT				
a	0.36	0.02	17.22	< .001***
b	0.01	0.01	0.58	.56
c	0.09	0.01	4.35	< .001***
c′	0.09	0.01	3.84	< .001**
indirect	0.004	0.003	0.58	.56
Model 2. Rejection Mediating Sexual Dysfunction and Pain Face RT				
a	0.45	0.02	21.39	< .001***
b	-0.09	0.01	-4.60	< .001***
c	0.09	0.01	4.25	< .001***
c′	0.14	0.01	5.64	< .001***
indirect	-0.04	0.004	-4.46	< .001***
Model 3. Incompetence Mediating Sexual Dysfunction and Pain Face RT				
a	0.42	0.02	19.01	< .001***
b	-0.10	0.01	-5.07	< .001***
c	0.09	0.01	4.25	< .001***
c′	0.14	0.01	5.86	< .001***
indirect	-0.04	0.003	-4.86	< .001***
Model 4. Self-Deprecation Mediating Sexual Dysfunction and Pain Face RT				
a	0.42	0.02	15.34	< .001***
b	-0.14	0.01	-2.27	< .001***
c	0.09	0.01	4.25	< .001***
c′	0.14	0.01	4.68	< .001***
indirect	-0.06	0.003	-2.22	< .001***
Model 5. Difference-Loneliness Mediating Sexual Dysfunction and Pain Face RT				
a	0.35	0.02	14.86	< .001***
b	-0.02	0.01	-2.14	.02*
c	0.09	0.01	3.30	< .001***
c′	0.11	0.01	3.71	< .001***
indirect	-0.02	0.002	-2.09	.03*

*Note. * = p < 05, ** = p < .01, *** = p < .001*

Table 16. *Neutral Face Mediation Analyses for Experiment 2*

Path	*β*	SE	Z	*P*
Model 1. Helplessness Mediating Sexual Dysfunction and Neutral Face RT				
a	0.38	0.02	17.72	< .001***
b	0.01	0.01	0.65	0.515
c	0.07	0.01	3.30	.001***
c′	0.07	0.01	2.94	< .003**
indirect	0.01	0.003	0.65	0.518
Model 2. Rejection Mediating Sexual Dysfunction and Neutral Face RT				
a	0.45	0.02	21.50	< .001***
b	-0.09	0.01	-4.66	< .001***
c	0.07	0.01	3.30	.001***
c′	0.12	0.01	4.76	< .001***
indirect	-0.04	0.004	-4.51	< .001***
Model 3. Incompetence Mediating Sexual Dysfunction and Neutral Face RT				
a	0.42	0.02	19.25	< .001***
b	-0.09	0.01	-4.65	< .001***
c	0.07	0.01	3.30	.001***
c′	0.11	0.01	4.78	< .001***
indirect	-0.04	0.003	-4.49	< .001***
Model 4. Self-Deprecation Mediating Sexual Dysfunction and Neutral Face RT				
a	0.42	0.02	19.33	< .001***
b	-0.15	0.01	-7.39	< .001***
c	0.07	0.01	3.30	.001***
c′	0.14	0.01	5.66	< .001***
indirect	-0.06	0.003	-7.02	< .001***
Model 5. Difference-Loneliness Mediating Sexual Dysfunction and Neutral Face RT				
a	0.34	0.02	14.86	< .001***
b	-0.04	0.01	-2.14	0.023*
c	0.07	0.01	3.30	.001***
c′	0.09	0.01	3.71	< .001***
indirect	-0.01	0.002	-2.09	0.026*

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

Figures

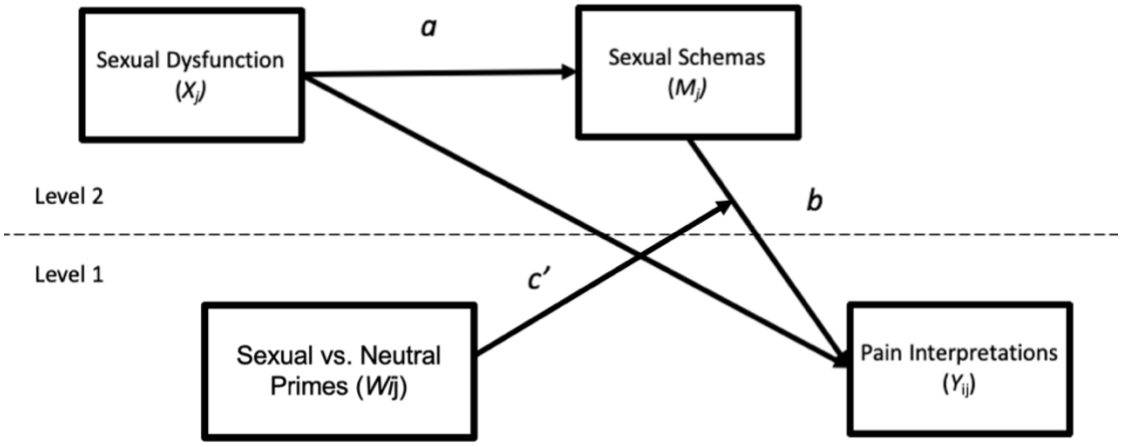

Figure 1. *2-2-1-1 Multilevel Moderated-Mediation Model for Perceptions of Pain in Ambiguous Sexual Faces*

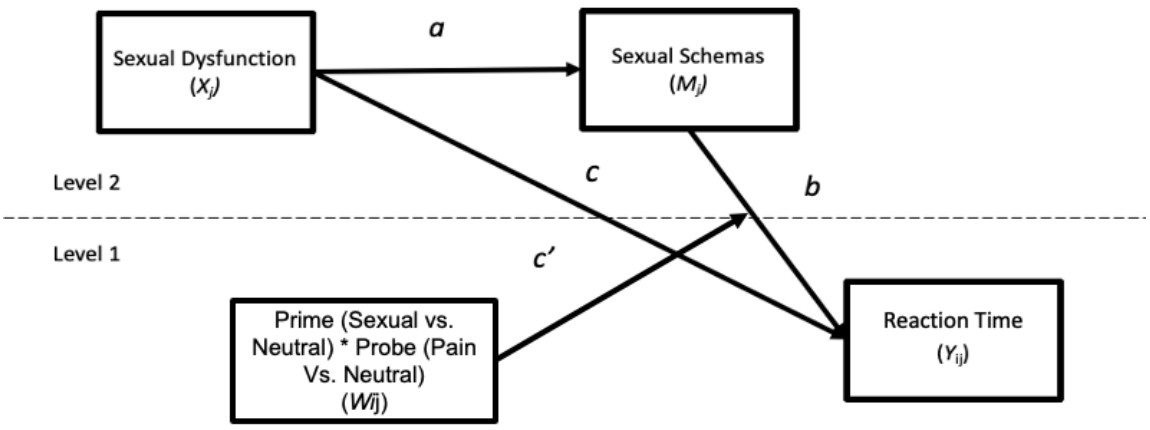

Figure 2. *2-2-1-1 Multilevel Moderated Mediation Model for RT.*

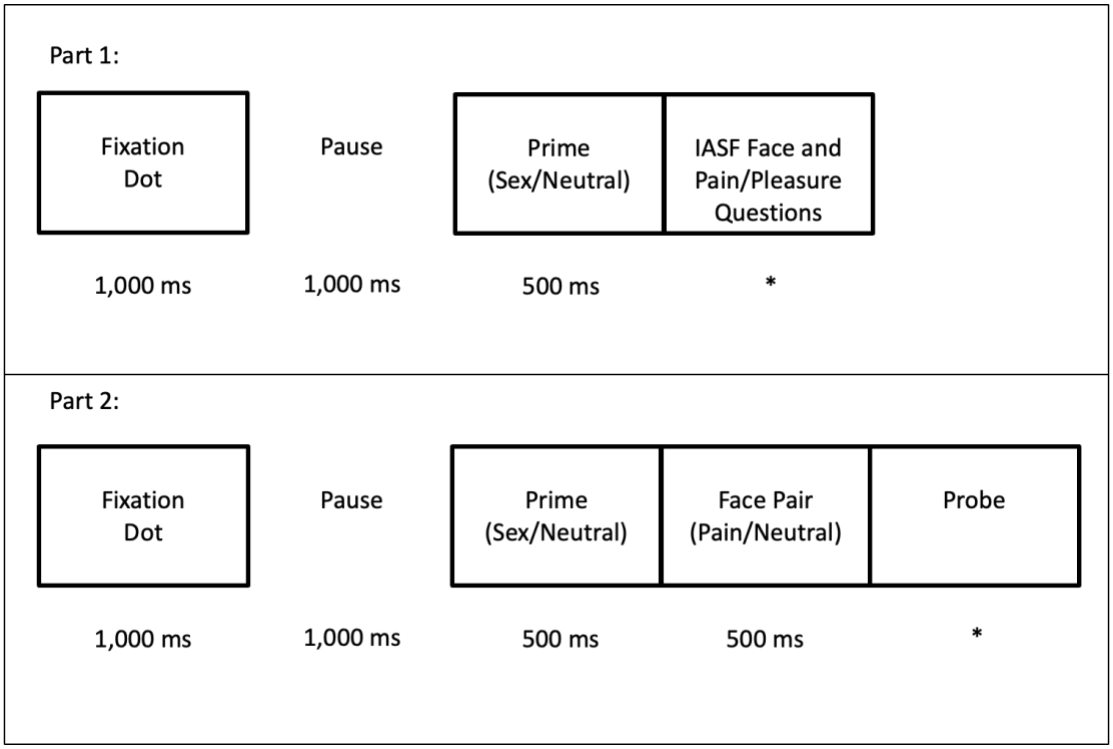

Figure 3. *Proceedings of Experimental Trials*

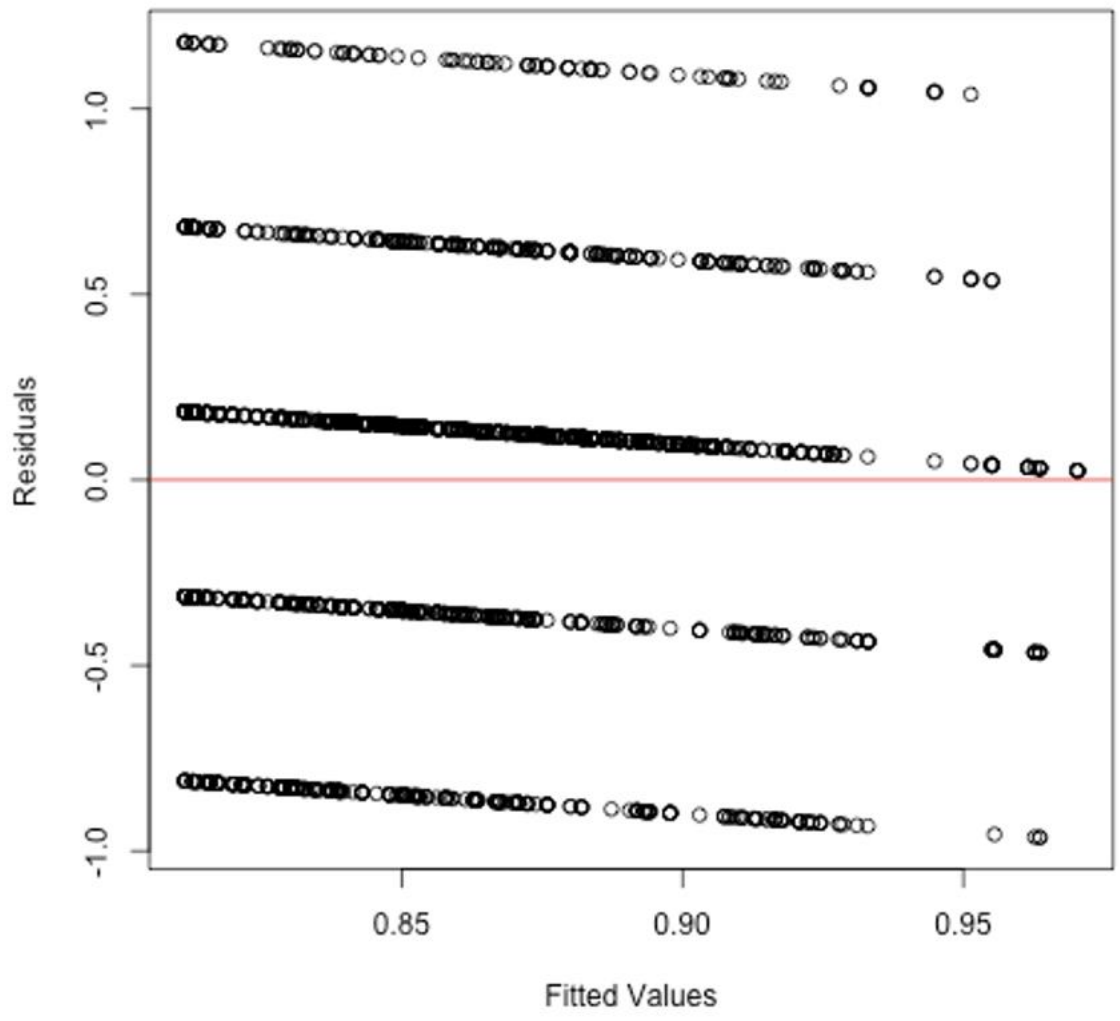

Figure 4. *Plotted Residuals Regressing Incompetence Schemas on Perceptions of Pain in Ambiguous Sexual Faces.*

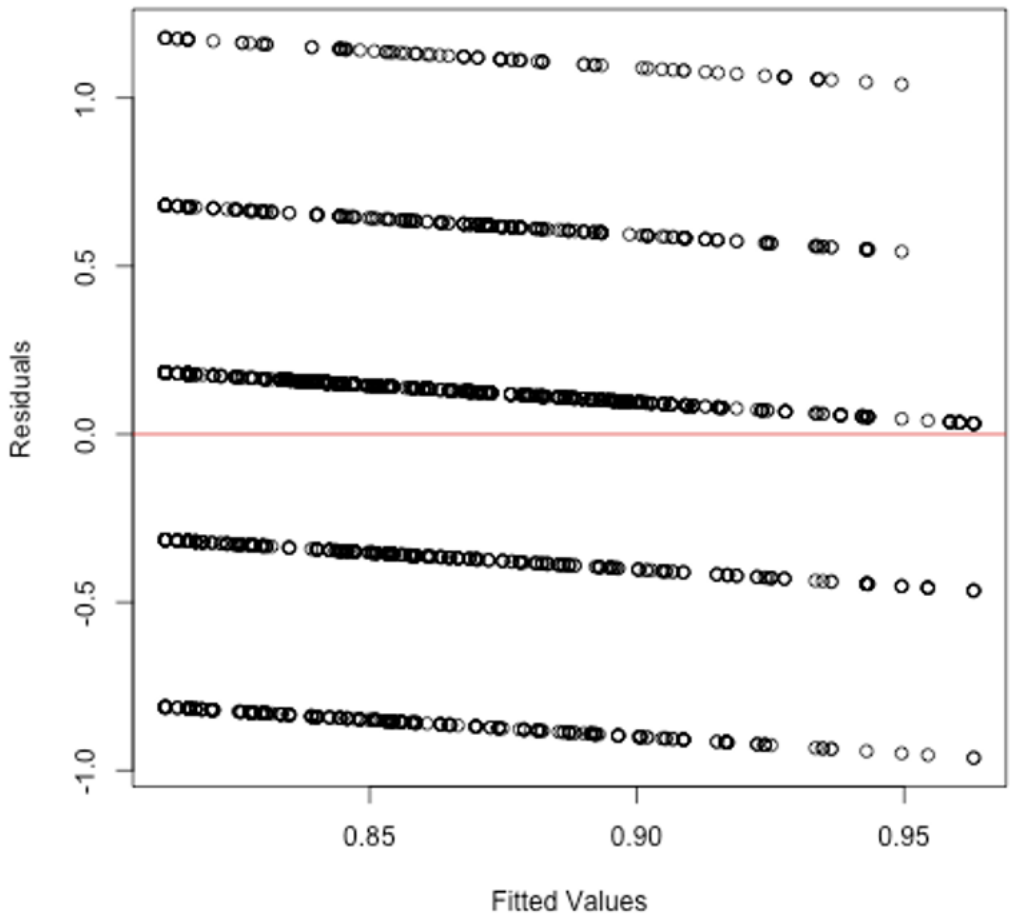

Figure 5. *Plotted Residuals Regressing Undesirability/Rejection Schemas on Perceptions of Pain in Ambiguous Sexual Faces.*

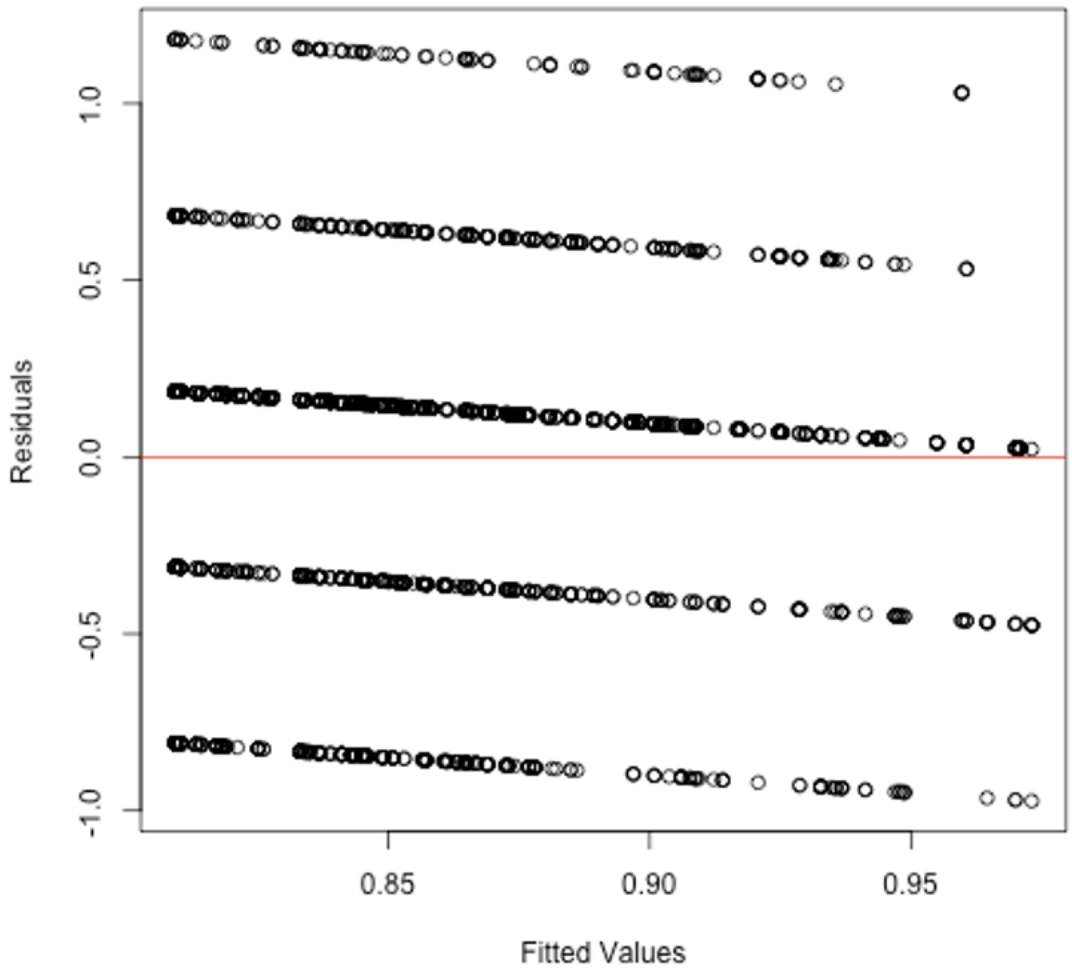

Figure 6. *Plotted Residuals Regressing Self-Deprecation Schemas on Perceptions of Pain in Ambiguous Sexual Faces.*

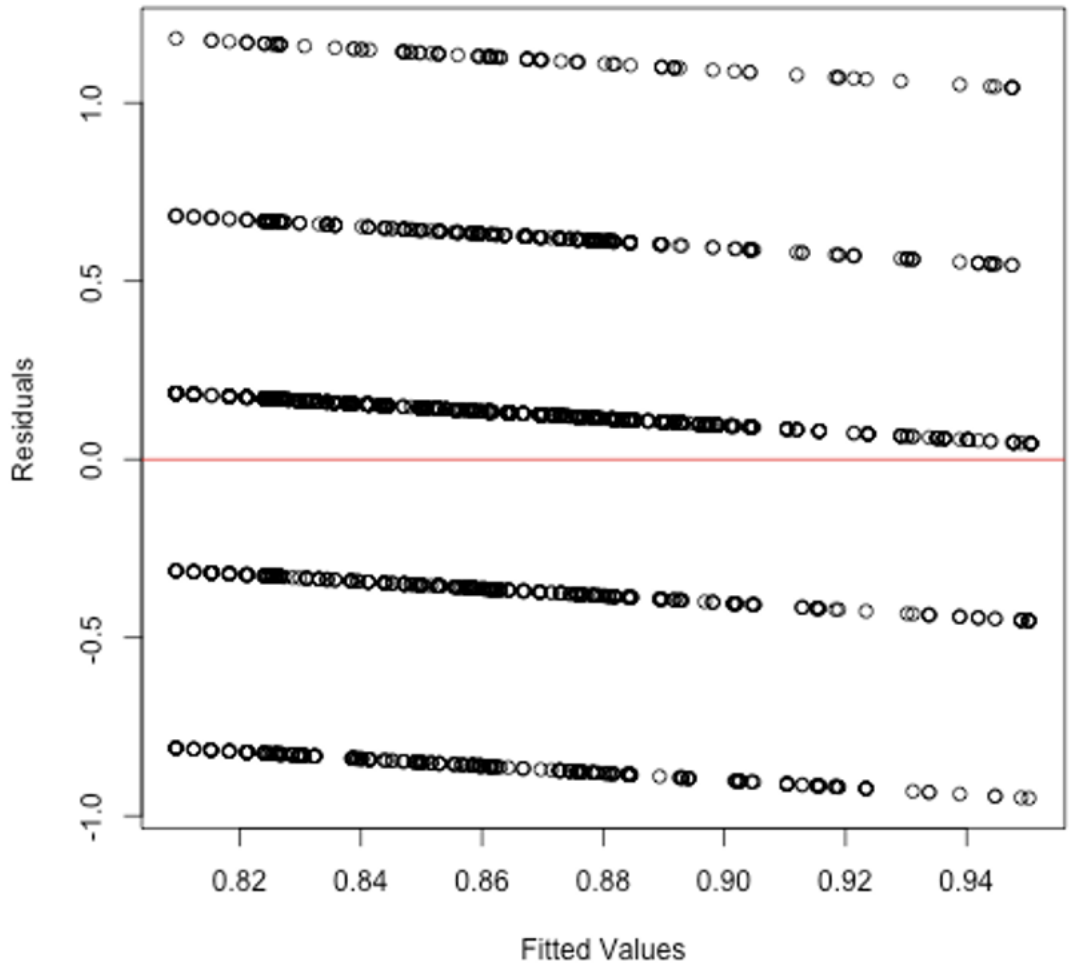

Figure 7. *Plotted Residuals Regressing Loneliness Schemas on Perceptions of Pain in Ambiguous Sexual Faces.*

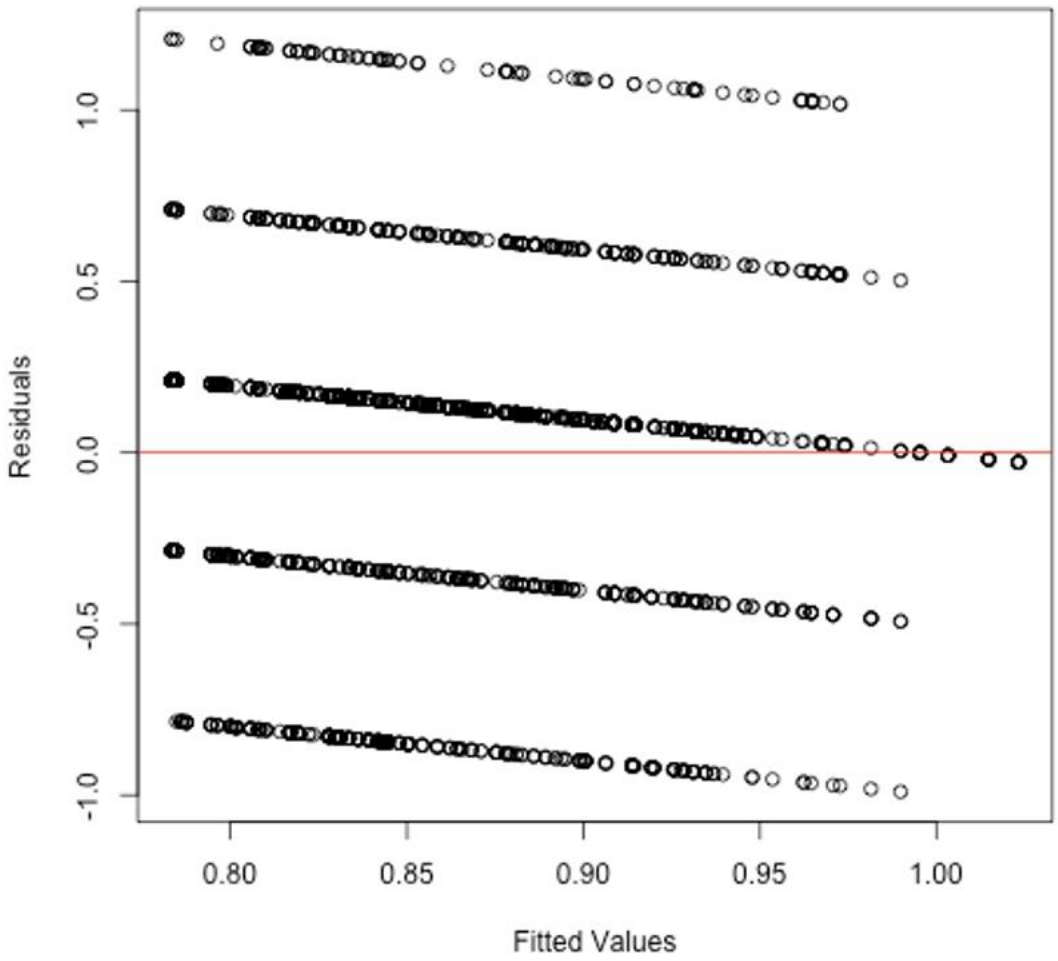

Figure 8. *Plotted Residuals Regressing Helplessness Schemas on Perceptions of Pain in Ambiguous Sexual Faces.*

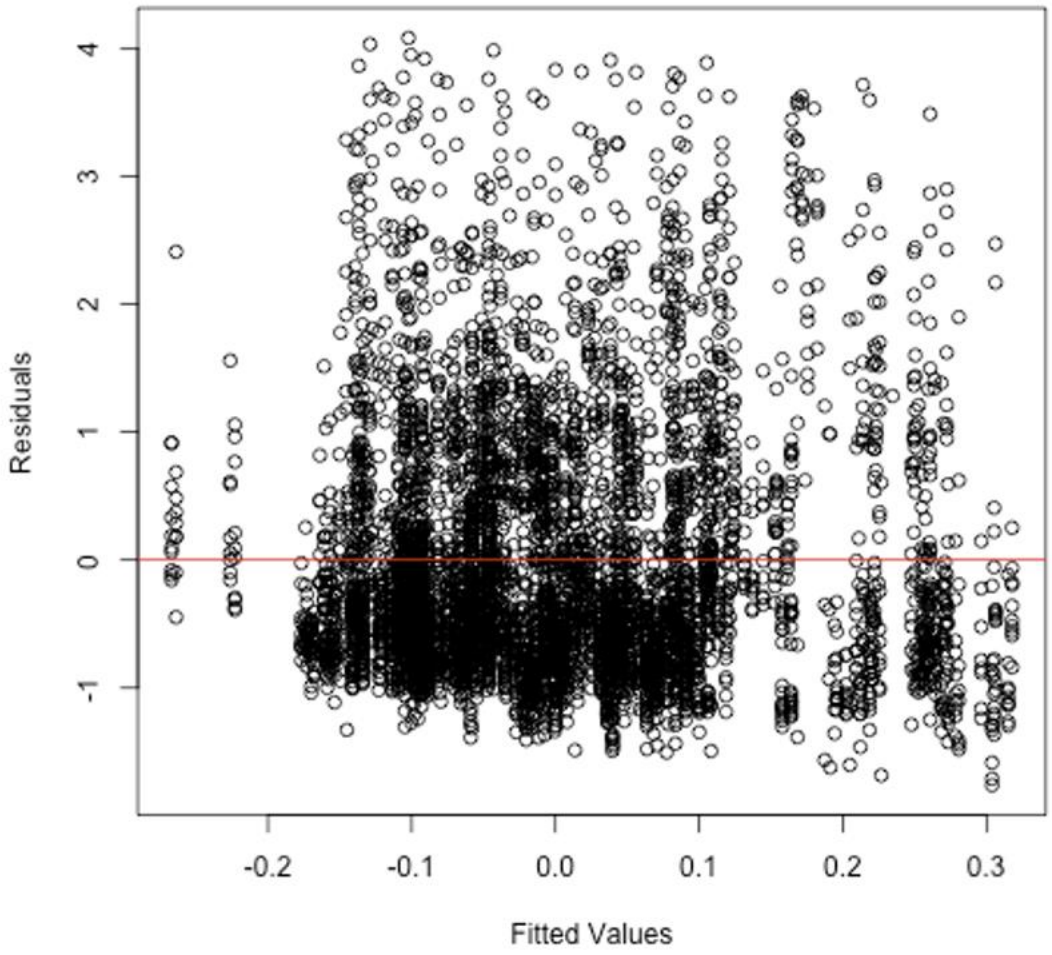

Figure 9. *Plotted Residuals Regressing Incompetence Schemas on Perceptions of Pain Face RTs.*

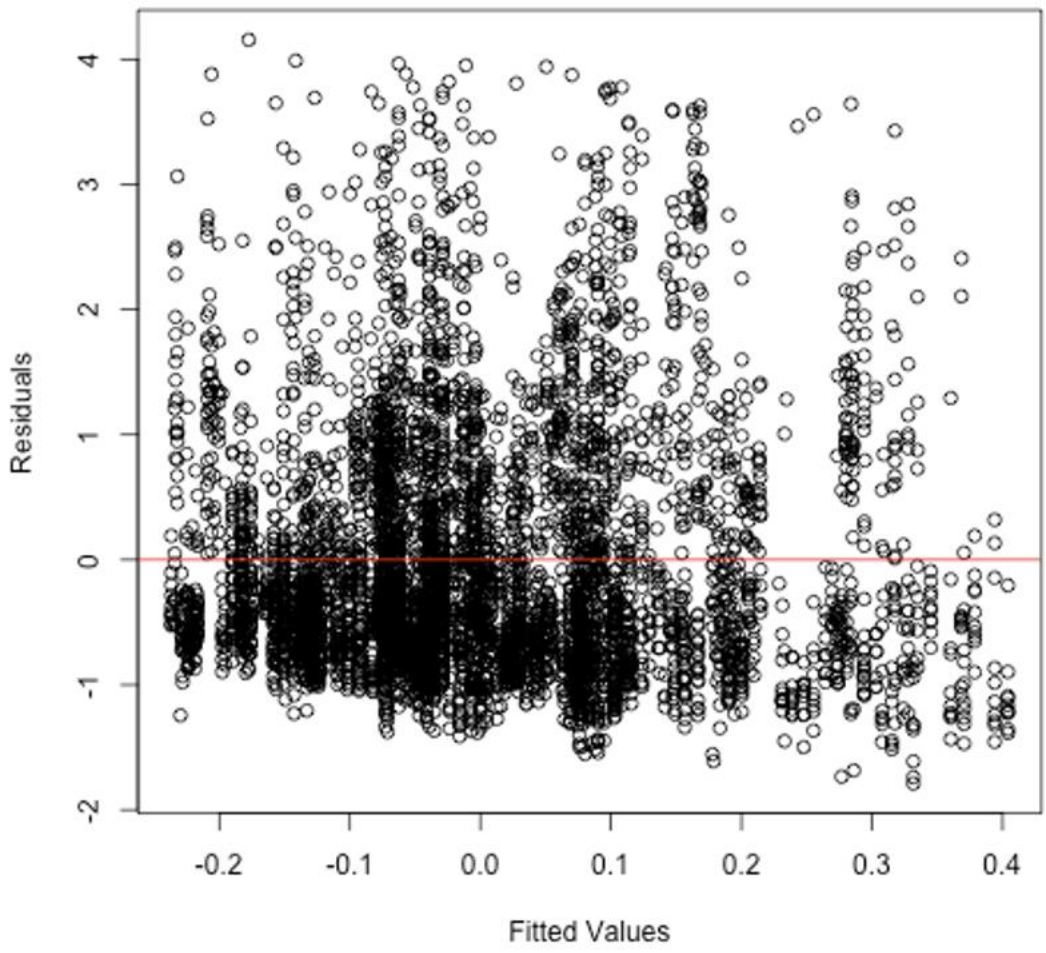

Figure 10. *Plotted Residuals Regressing Undesirability/Rejection Schemas on Perceptions of Pain Face RTs.*

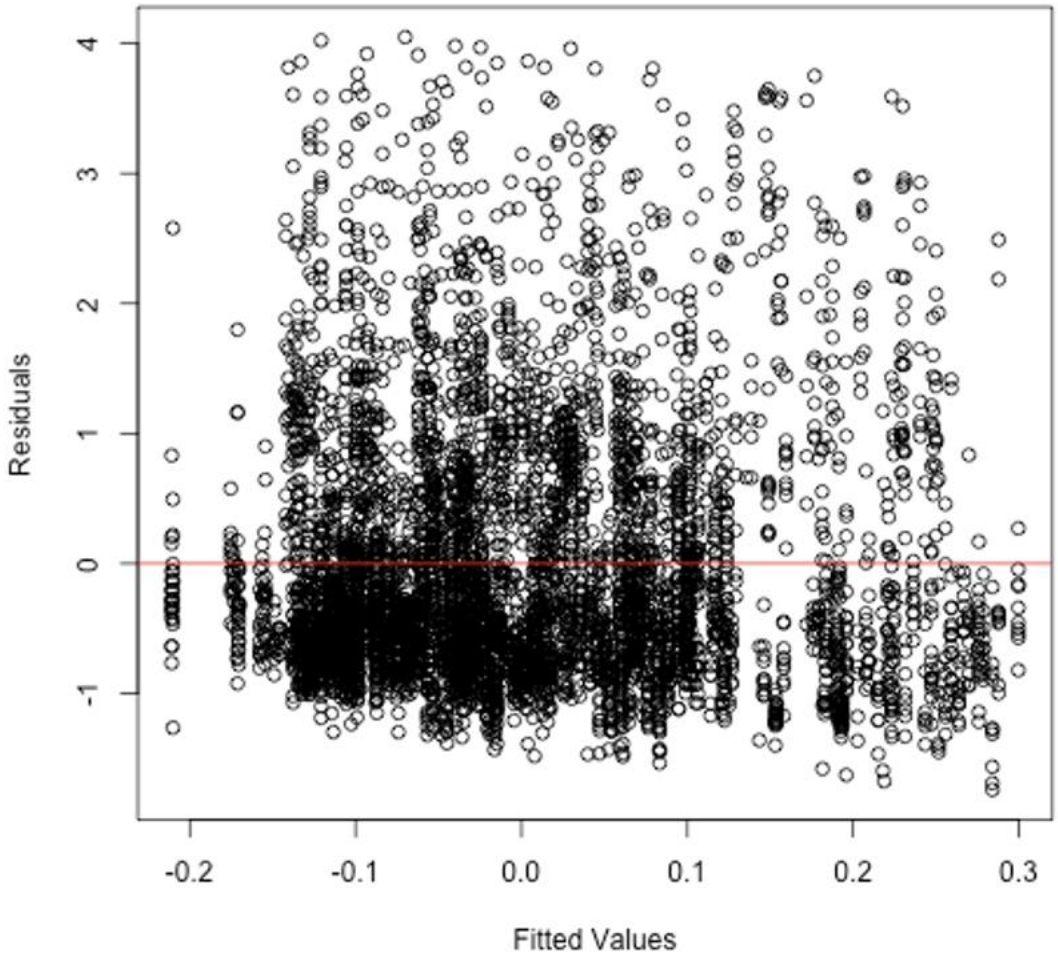

Figure 11. *Plotted Residuals Regressing Difference-Loneliness Schemas on Perceptions of Pain Face RTs.*

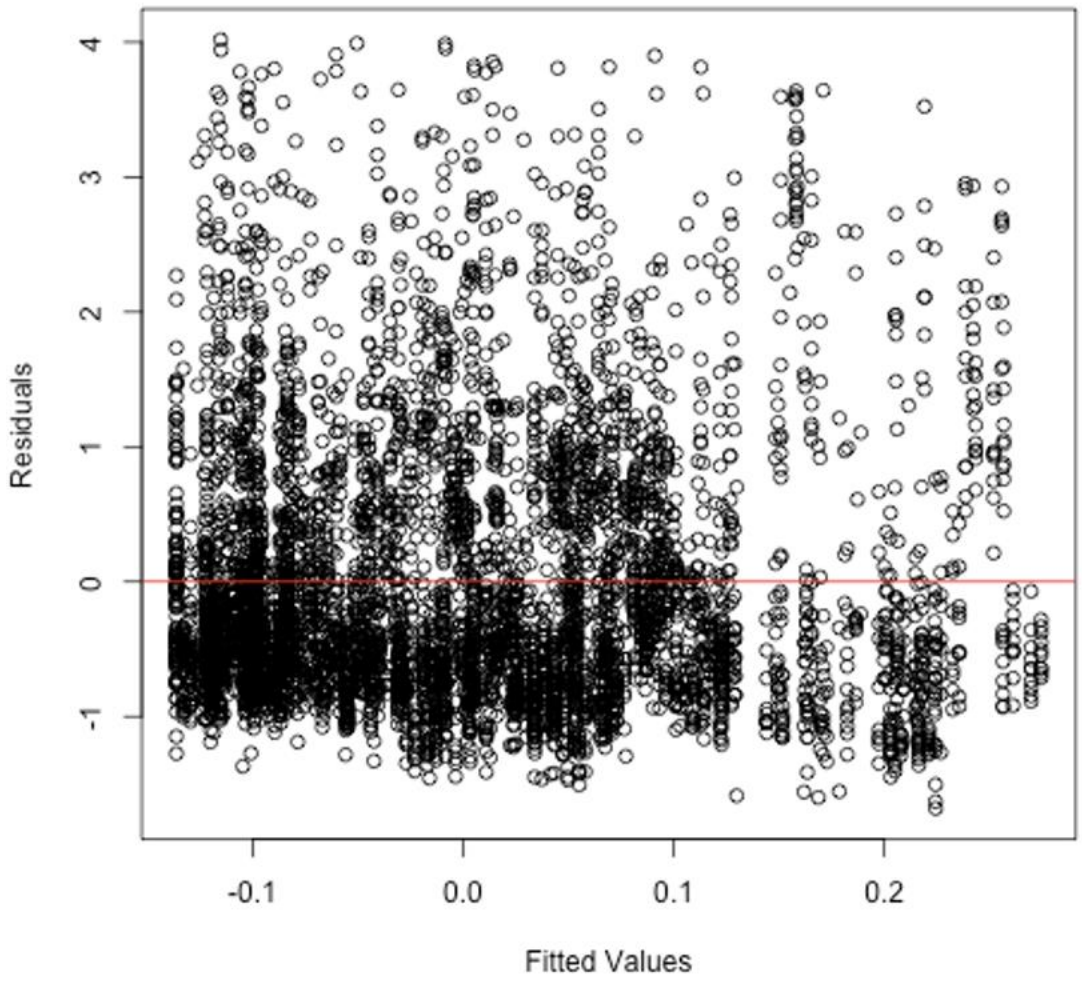

Figure 12. *Plotted Residuals Regressing Helplessness Schemas on Perceptions of Pain Face RTs.*

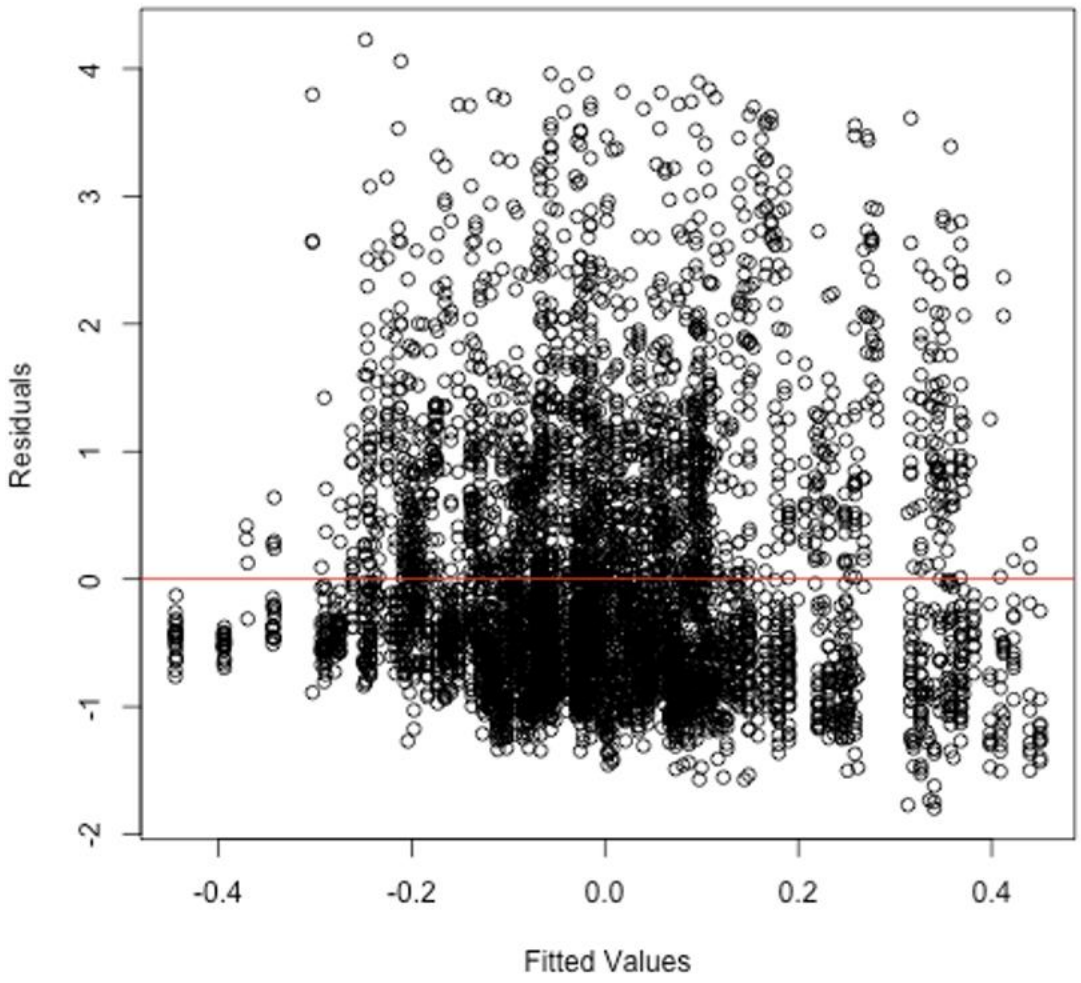

Figure 13. *Plotted Residuals Regressing Self-Deprecation Schemas on Perceptions of Pain Face RTs.*

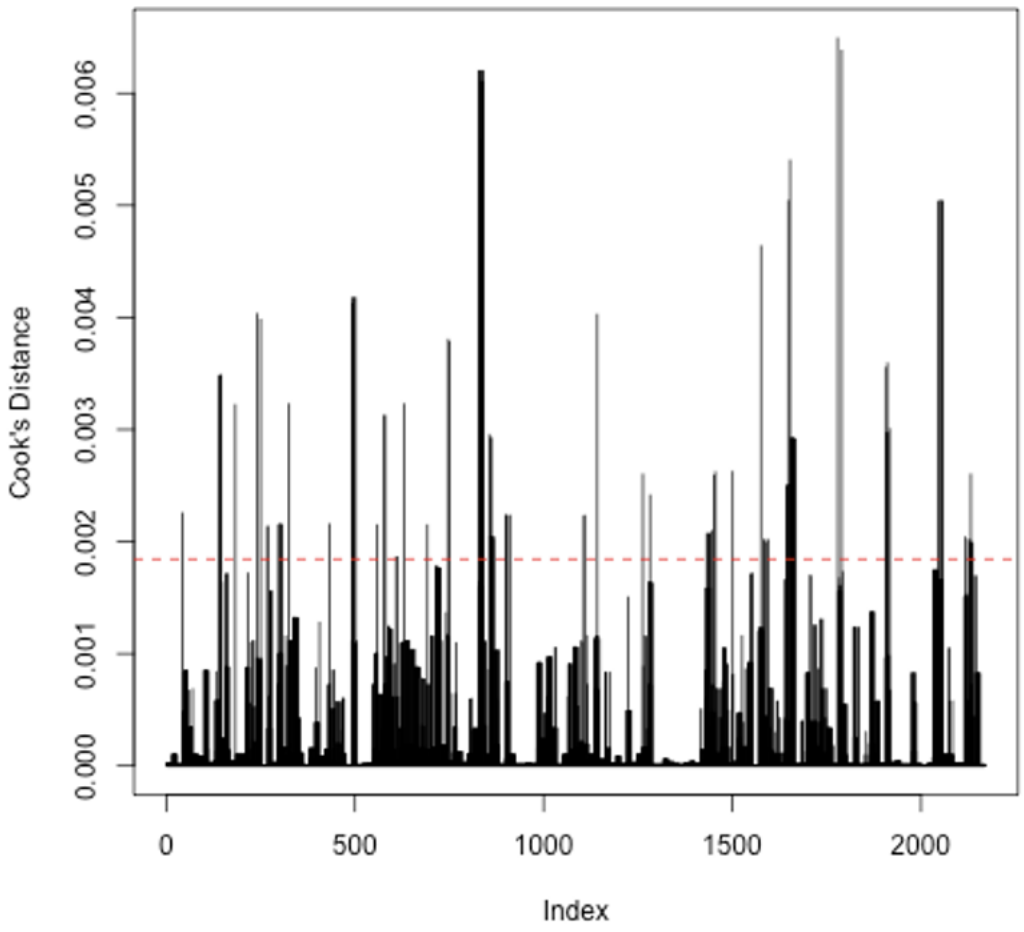

Figure 14. *Plotted Cook's Distance Scores for Helplessness Schemas in Experiment 1.*

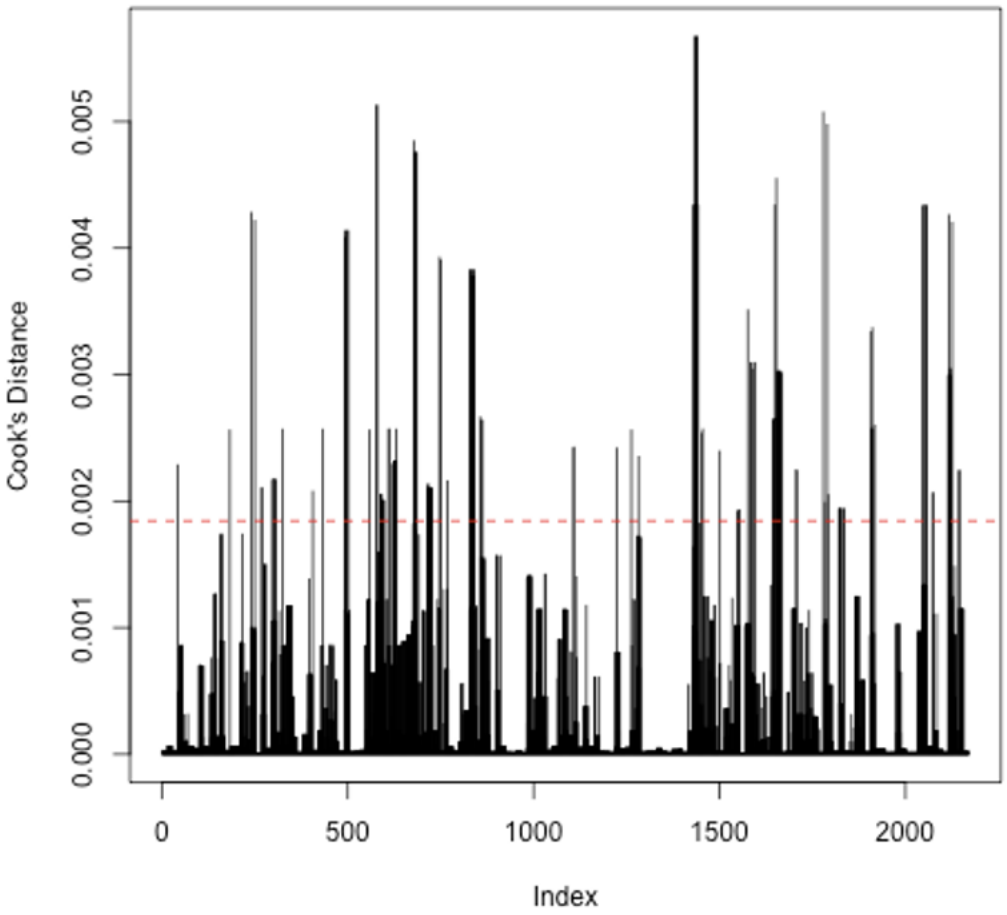

Figure 15. *Plotted Cook's Distance Scores for Incompetence Schemas in Experiment 1.*

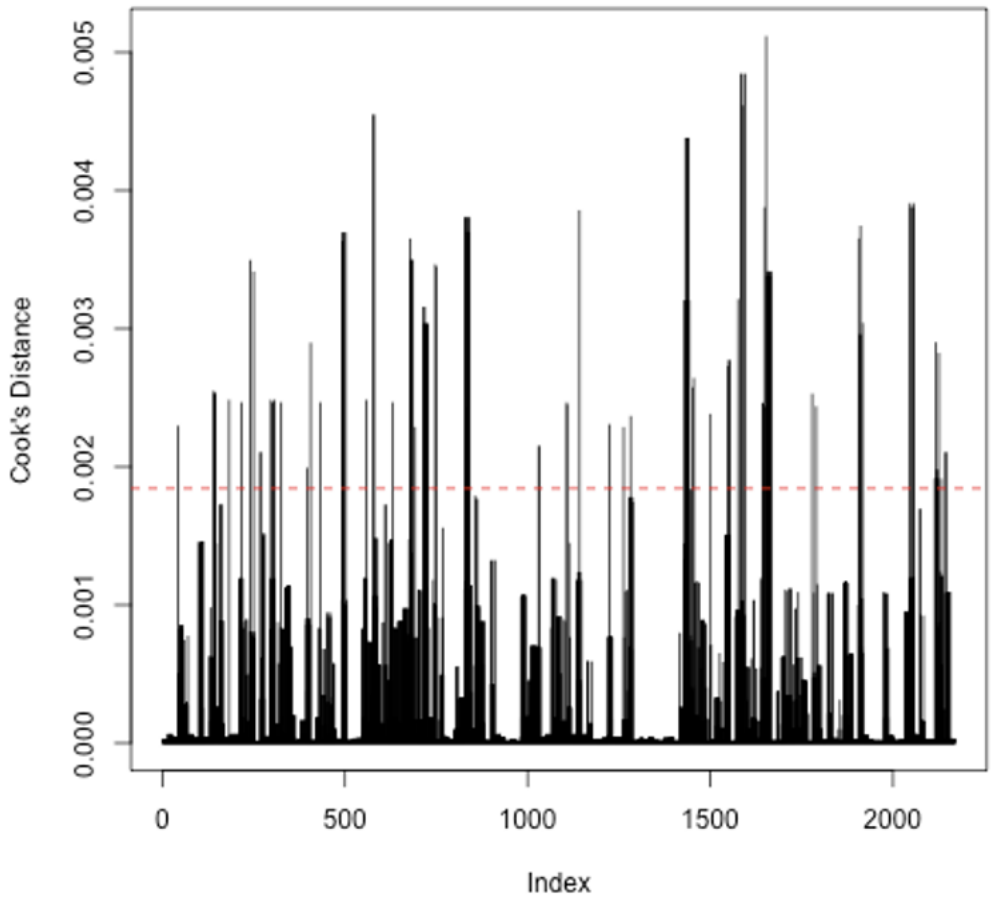

Figure 16. *Plotted Cook's Distance Scores for Undesirability/Rejection Schemas in Experiment 1.*

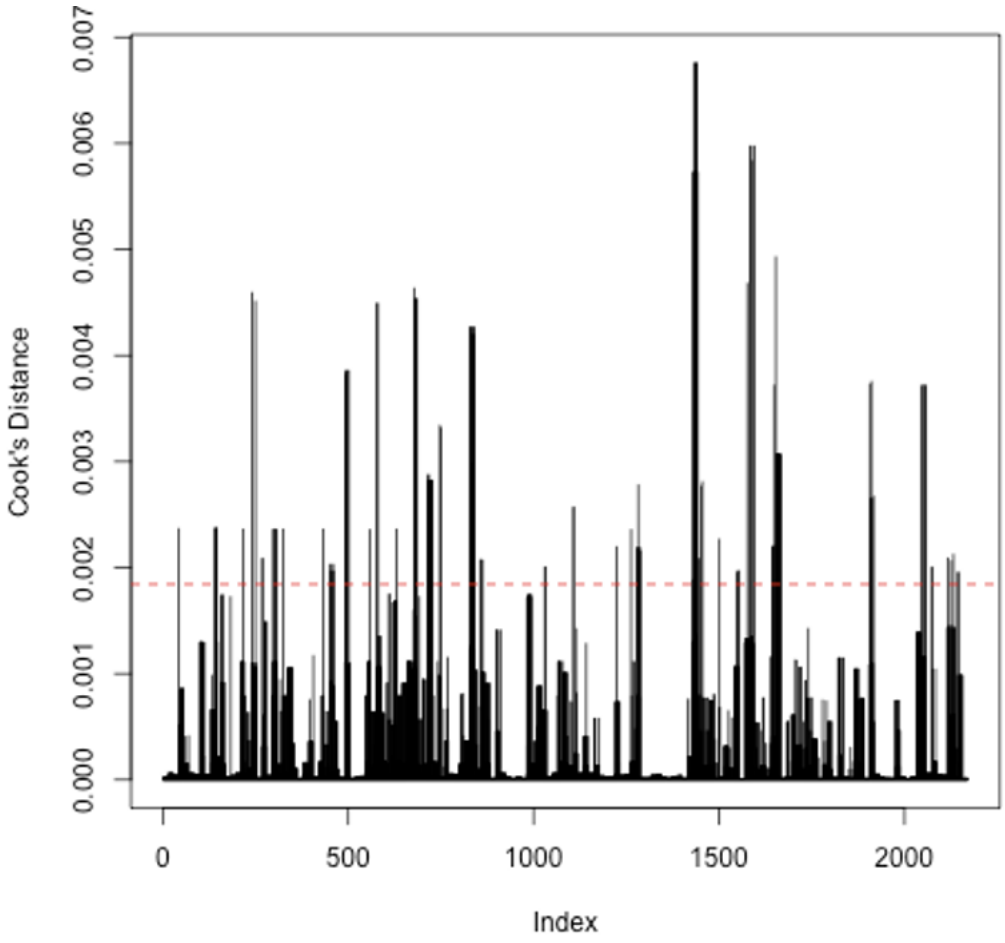

Figure 17. *Plotted Cook's Distance Scores for Self-Deprecation Schemas in Experiment 1.*

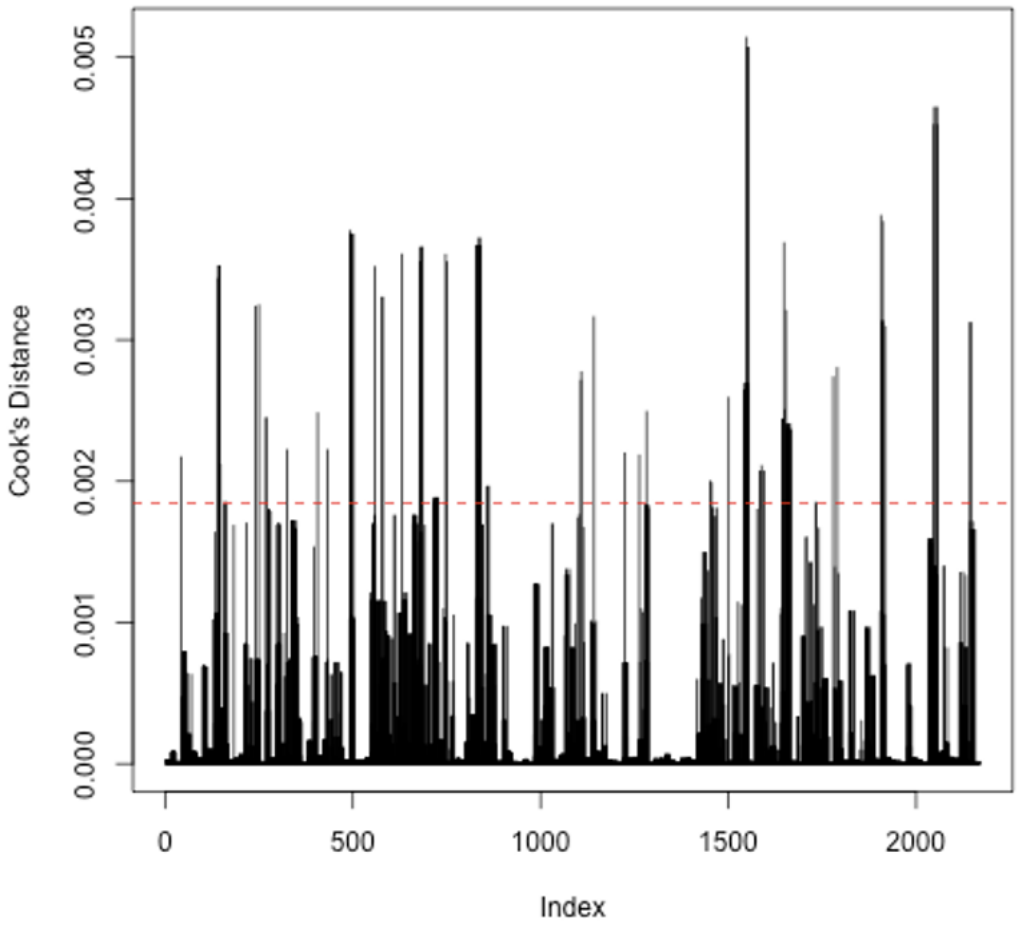

Figure 18. *Plotted Cook's Distance Scores for Difference-Loneliness Schemas in Experiment 1.*

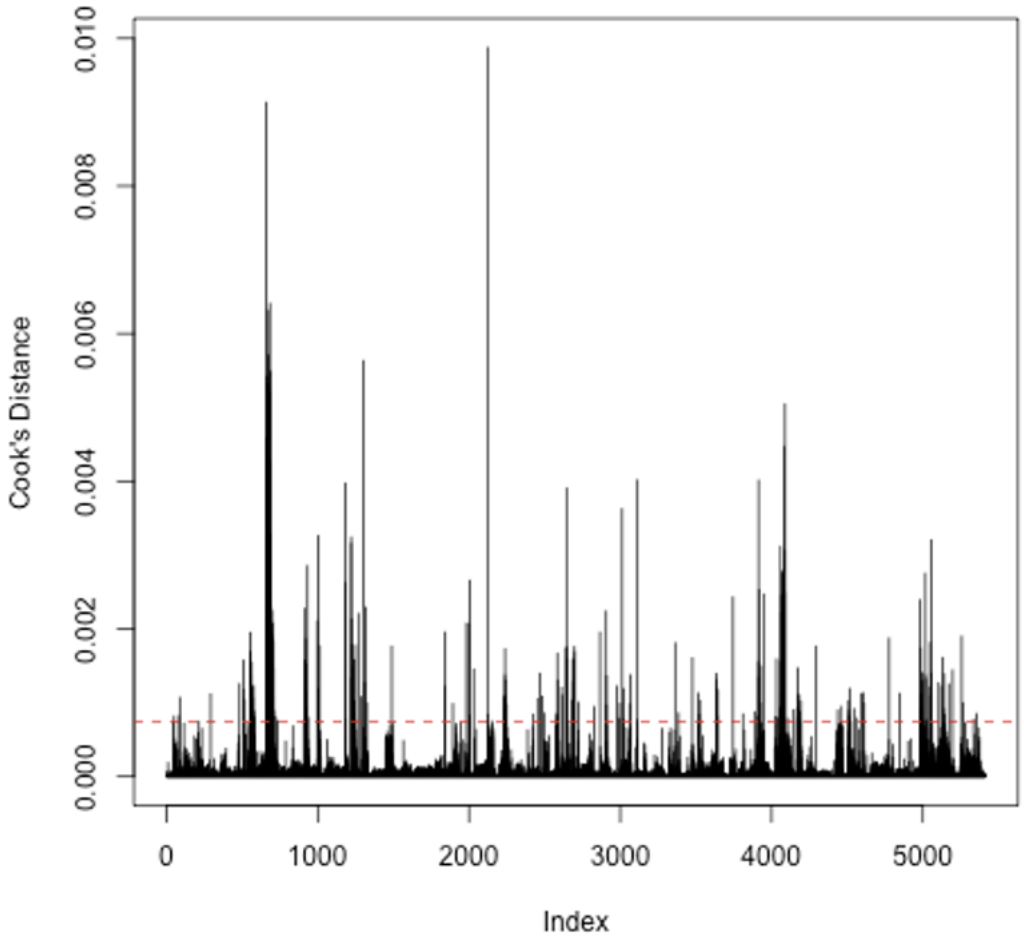

Figure 19. *Plotted Cook's Distance Scores for Helplessness Schemas in Experiment 2.*

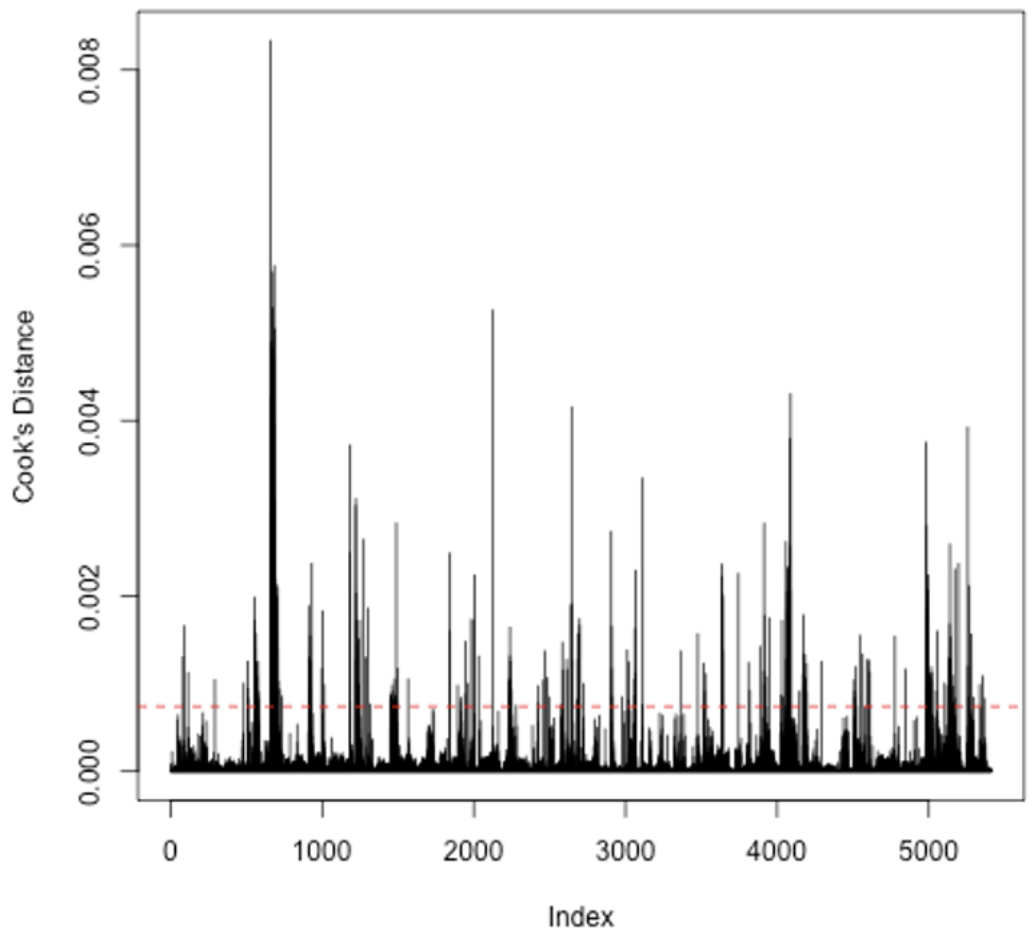

Figure 20. *Plotted Cook's Distance Scores for Incompetence Schemas in Experiment 2.*

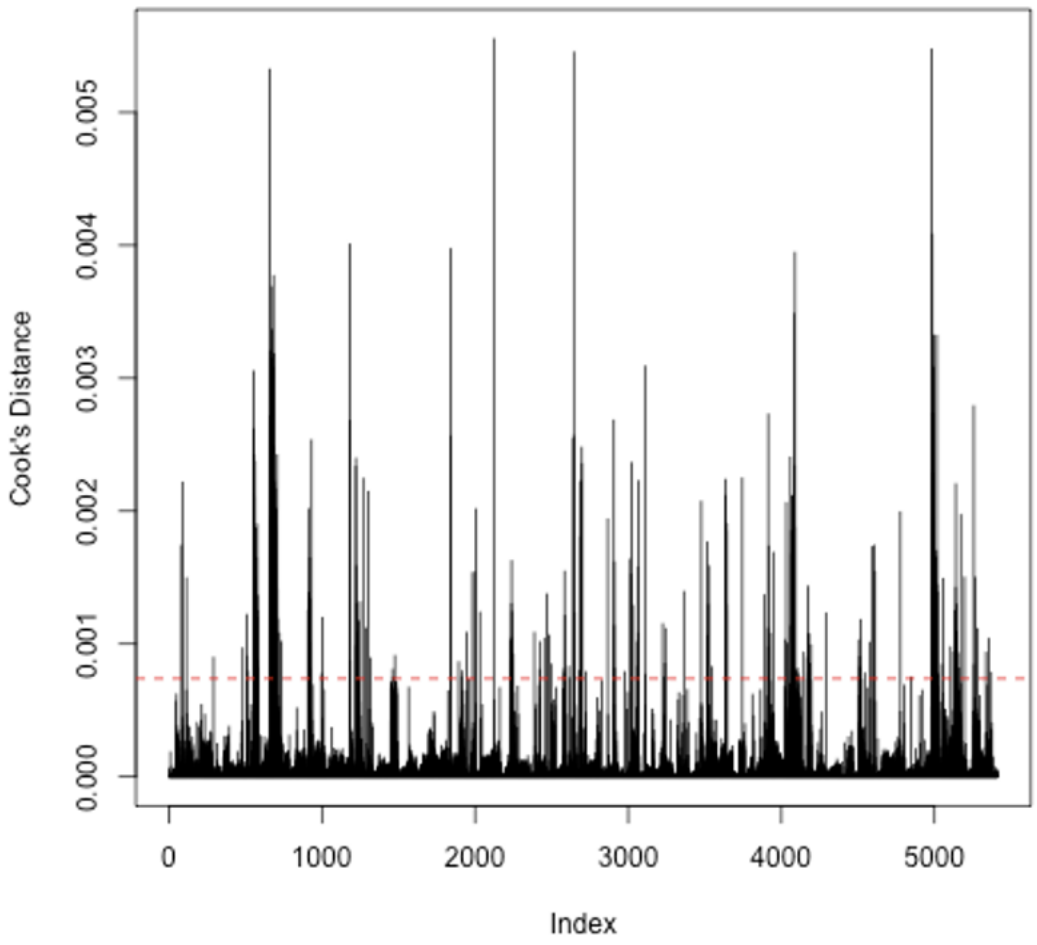

Figure 21. *Plotted Cook's Distance Scores for Undesirability/Rejection Schemas in Experiment 2.*

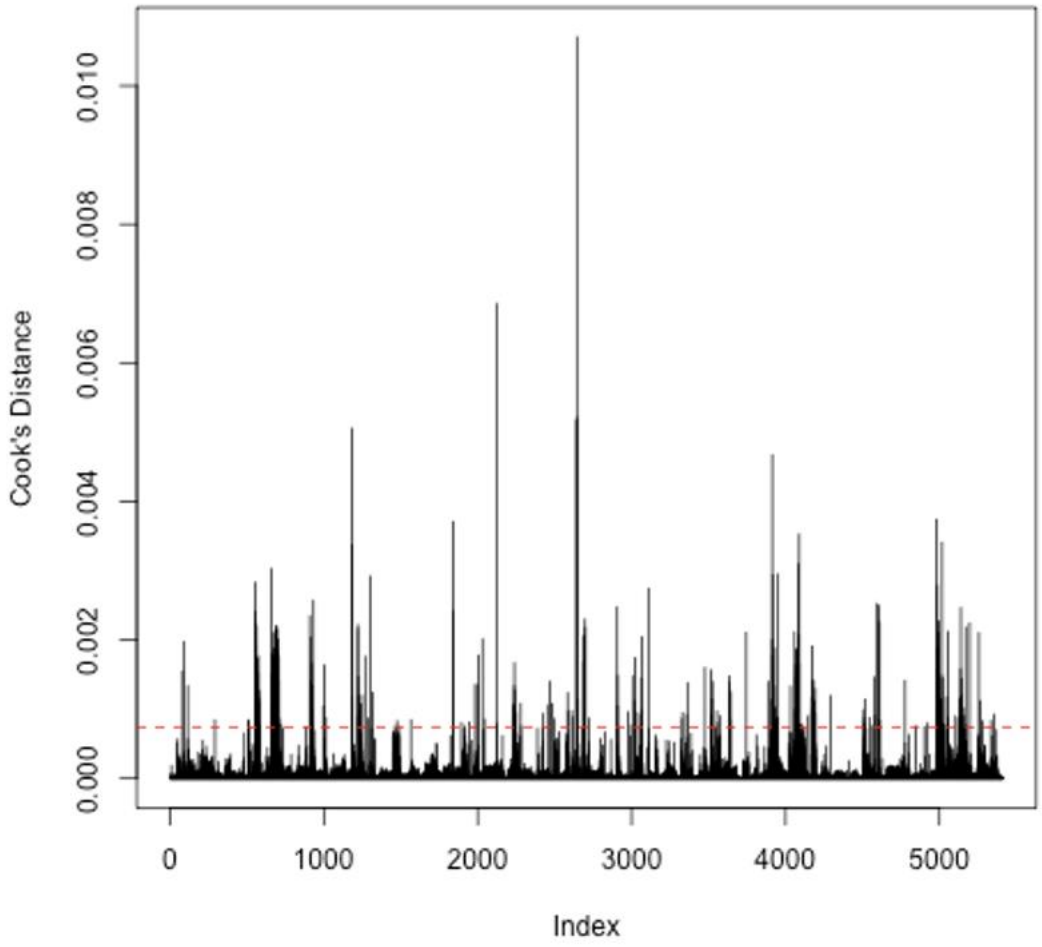

Figure 22. *Plotted Cook's Distance Scores for Self-Deprecation Schemas in Experiment 2.*

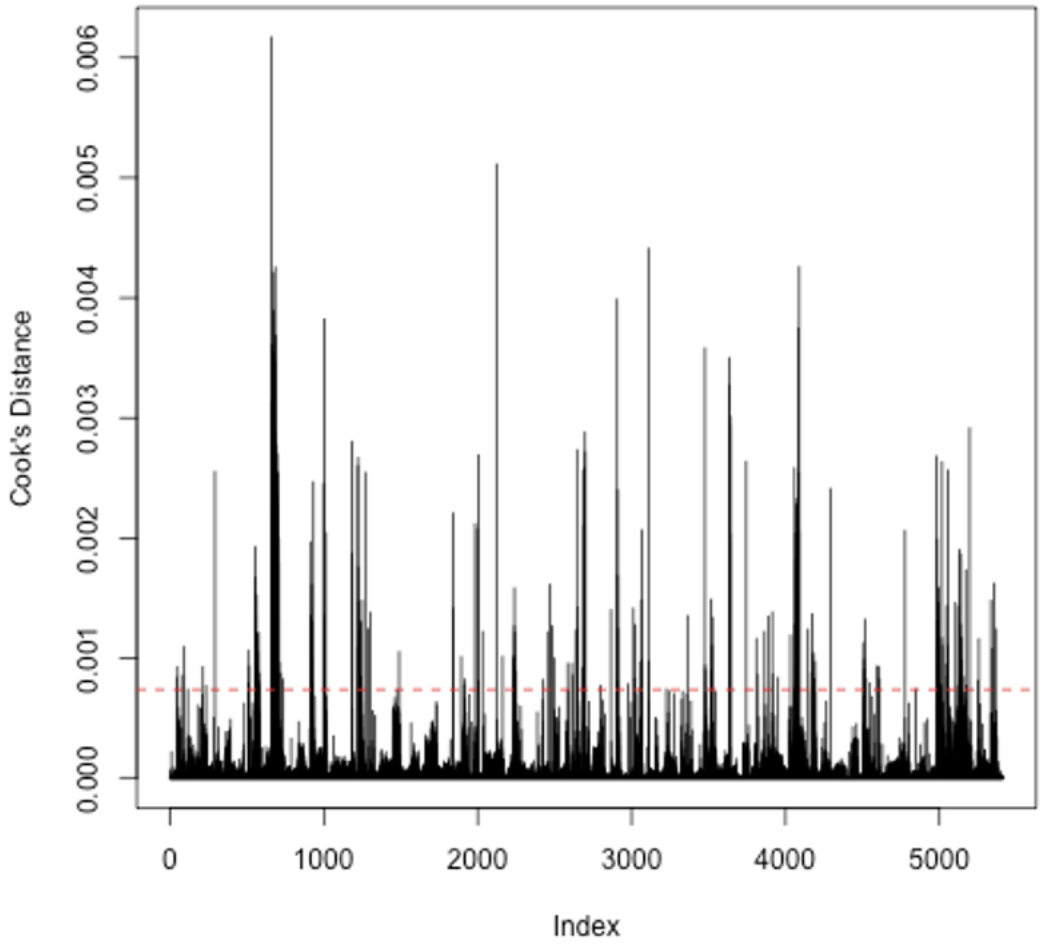

Figure 23. *Plotted Cook's Distance Scores for Difference-Loneliness Schemas in Experiment 2.*

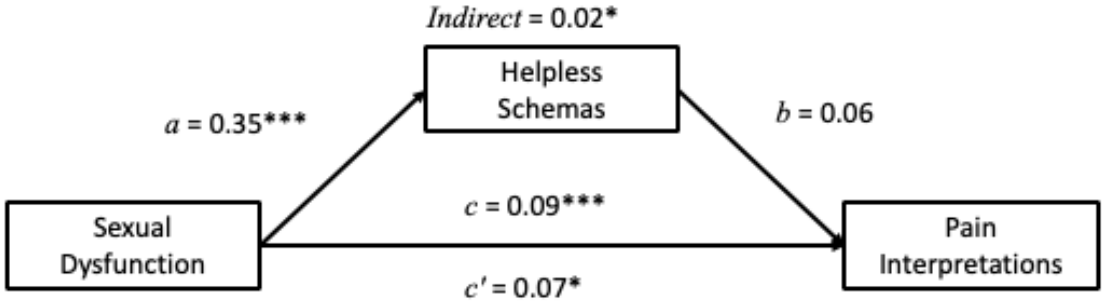

Figure 24. *Path Diagram for Mediation of Helplessness Schemas on the Relationship Between Sexual Dysfunction and Perceptions of Pain in Ambiguous Sexual Faces.*
*Note. * = p < 05, ** = p < .01, *** = p < .001*

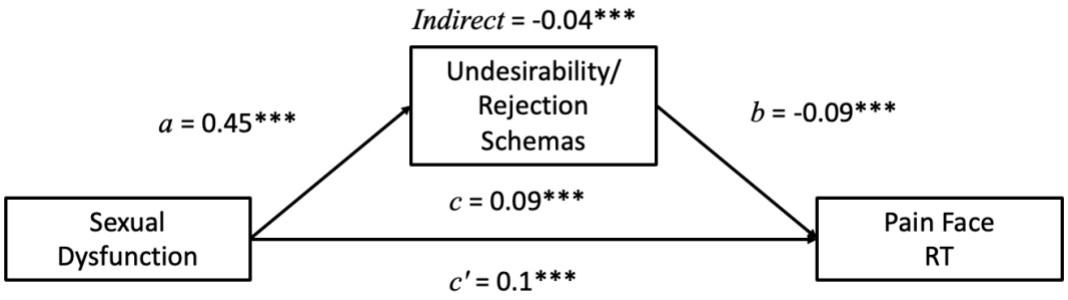

Figure 25. *Path Diagram for Mediation of Undesirability/Rejection Schemas on the Relationship Between Sexual Dysfunction and Pain Face RTs.*
Note. *** = $p < .001$

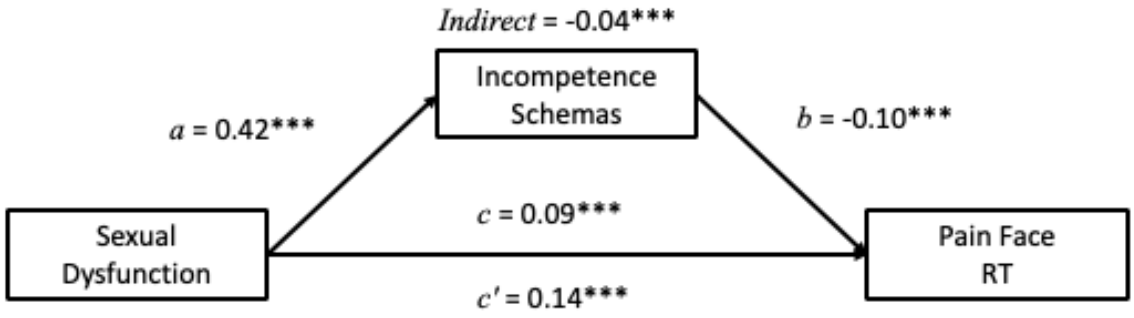

Figure 26. *Path Diagram for Mediation of Incompetence Schemas on the Relationship Between Sexual Dysfunction and Pain Face RTs.*
Note. *** = $p < .001$

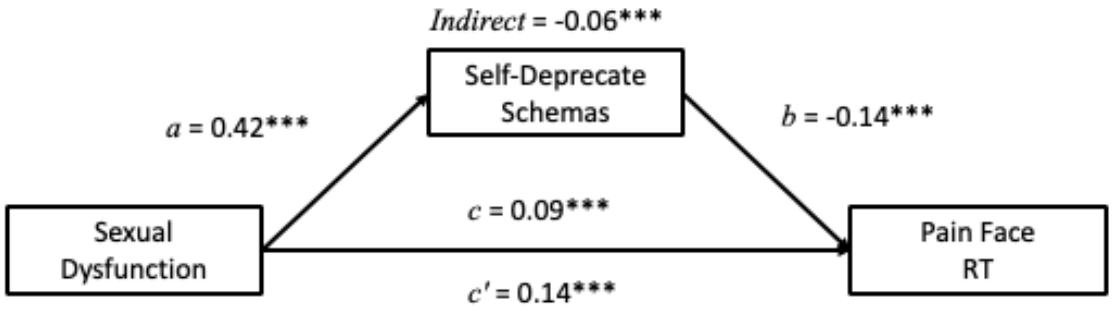

Figure 27. *Path Diagram for Mediation of Self-Deprecation Schemas on the Relationship Between Sexual Dysfunction and Pain Face RTs.*
Note. *** = $p < .001$

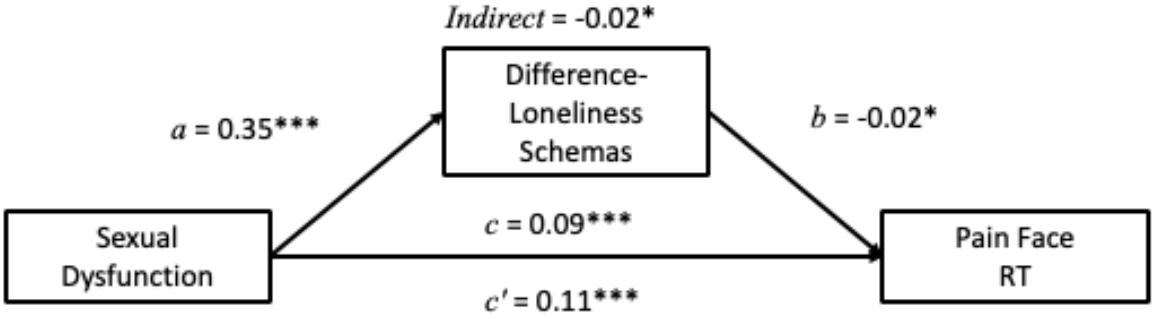

Figure 28. *Path Diagram for Mediation of Difference-Loneliness Schemas on the Relationship Between Sexual Dysfunction and Pain Face RTs.*
*Note. * = p < 05, ** = p < .01, *** = p < .001*

REFERENCES

Ace, K. J. (2007). Mental health, mental illness, and sexuality. In: M. S. Tepper & A. F. Owens (Eds.), Sexual health volume 1: Psychological foundations (pp. 301-329). Westport, CT: Praeger Publishers/Greenwood Publishing Group.

American Psychological Association (2022). Diagnostic and statistical manual of mental disorders (5th ed., text rev.; DSM-5-TR). American Psychiatric Publishing.

Bach, A. K., Brown, T. A., Barlow, D. H. (1999). The effects of false negative feedback on efficacy expectations and sexual arousal in sexually functional males. *Behavior Therapy*, *30*, 79–95.

Bantin, T., Stevens, S., Gerlach, A. L., Hermann, C. (2016). What does the facial dot-probe task tell us about attentional processes in social anxiety? A systematic review. *Journal of Behavior Therapy and Experimental Psychiatry*, *50*, 40 – 51.

Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology*, *54*, 140–148.

Beck, A. T., (1964). Thinking and depression: Theory and therapy. *Archives of General Psychiatry*, *10*, 561 – 571.

Beck, A. T. (1967). *Depression: Clinical, Experimental and Theoretical Aspects*. New York: Harper and Row.

Beck, A. T., & Clark, D. A. (1996). The information processing model of anxiety: Automatic and strategic processes. *Behaviour Research and Therapy, 35,* 49–58.

Beck, A. T., Clark. D. A. (1988). Anxiety and depression: An information processing perspective. *Anxiety Research*, *1*, 23 – 36.

Broadbent, D. E. (1958). *Perception and communication. Oxford*: Oxford University Press.

Carr, T. H., McCauley, C., Sperber, R. D., & Parmelee, C. M. (1982) Words, pictures, and priming: On semantic activation, conscious identification, and the automaticity of information processing. *Journal of Experimental Psychology: Human Perception and Performance*, *8*, 757–777.

Chen, C., Crivelli, C., Garrod, O. G. B., Schyns, P. G., Fernández-Dols, J., & Jack, R. E. (2018). Distinct facial expressions represent pain and pleasure across cultures. *Proceedings of the National Academy of Sciences*, Oct 2018, 115 (43).

Clark, R. E. (2005). The classical origins of Pavlov's conditioning. *Integrative Physiological & Behavioral Science*, *39*, 279 – 294.

Dane, Ş., & Erzurumluoğlu, A. (2003). Sex and handedness differences in eye-hand visual RTs in handball players. *International Journal of Neuroscience*, *113*, 923–929.

Driver, J. (2001). A selective review of selective attention research from the past century. British *Journal of Psychology*, *92*, 53-78.

Donahey, K. M., Carroll, R. A. (1993). Gender differences in factors associated with hypoactive sexual desire. *Journal of Sex and Marital Therapy*, *18*, 25 – 40.

Ebner, N. C., Riediger, M., &Lindenberger, U. (2010). FACES – A database of facial expressions in young, middle-aged, and older men and women: Development and validation. *Behavior Research Methods*, *42*, 351 – 361.

Everaerd. W. (2007). Discussion paper. In E. Janssen (Ed.), *The psychophysiology of sex* (pp. 304–307). Bloomington, IN: Indiana University Press.

Faith, M. S., & Schare, M. L. (1993). The role of body image in sexually avoidant behavior. *Archives of Sexual Behavior*, *22*, 345–365.

Fernández-Dols, J., Carrera, p., & Crivelli, C. (2011). Facial behavior while experiencing sexual excitement. *Journal of Nonverbal Behavior*, *35*, 63–71.

Freedman, L. S., & Schatzkin, A. (1992). Sample size for studying intermediate endpoints within intervention trials of observational studies. American Journal of Epidemiology, 136, 1148-1159.

Geer, J. H., & Melton, J. S. (1997). Sexual content-induced delay with double-entendre words. *Archives of Sexual Behavior*, *26*, 295–316.

Geers. A. L., Lassiter, G. D. (2002). Effects of affective expectations on affective experience: The moderating role of optimism-pessimism. *Personality and Social Psychology*, *28*, 1026 – 1039.

Geers. A. L., Lassiter, G. D. (2003). Need for cognition and expectations as determinants of affective experience. *Basic and Applied Social Psychology*, *25*, 313 – 325.

Gomes, A. L. Q., & Nobre, P. (2012). Early maladaptive schemas and sexual dysfunction in men. *Archives of Sexual Behavior*, *41*, 311–320.

Gopher, D., & Iani, C. (2003). Attention. In L. Nadel (Ed.), *Encyclopedia of cognitive science* (pp. 220–226). New York, NY: Nature Publication Group.

Greenberg, J. S., Bruess, C. E., & Oswalt, S. B. (2014). Sexual dysfunction and therapy. In S. Goldberg, & S, Coombs (Eds.), *Exploring the dimensions of human sexuality*. (pp. 656 – 687). Burlington, MA: Jones & Bartlett Learning.

Hughes, S. M., Nicholson, S. E. (2008). Sex differences in the assessment of pain versus sexual pleasure facial expressions. *Journal of Social, Evolutionary, and Cultural Psychology*, *2*, 289–298.

Hyett, M. P., McEvoy, P. M. (2018). Social anxiety disorder: Looking back and moving forward. *Psychological Medicine*, *48*, 1937 – 1944.

Jalava, K. M., Mattila, M. J., Tarrasnen, M., Vankoski, J. (1995). Lorazepam and diazepam differently impair divided attention. *Pharmacology Biochemistry and Behavior*, *51*, 189 – 197.

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*, 8–23.

Jha, A., Banerjee, D. (2022) Neurobiology of sex and pornography addictions: A primer. *Journal of Psychosexual Health*, *4*, 227 – 236.

Kalb, R., Dörner, M., Kalb, S. (2005). Opposite effects of depression and antidepressants on processing speed and error rate. *Prog Neuropsychopharmacol Biol Psychiatry*, *30*, 244 – 250.

Kiss., M. K., McDonagh, L. K., Sparks, B., Hamp, T., & Morrison, T. G. (2020). Accurately assessing gay men's erectile functioning: A critique of the international index of erectile function (IIEF) use with gay men. *The Journal of Sex Research*, *58*, 589 – 598.

Knyazev, G. G., Savostyanov, A. N., Levin, E. A. (2006). Alpha synchronization and anxiety: Implications for inhibition vs. alertness hypothesis. *International Journal of Psychophysiology*, *59*, 151 – 158.

Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2005). In *Applied Linear Statistical Models* (5th ed., pp. 400 – 410). McGraw-Hill Irwin.

Laumann, E. O., Paik, A., Rosen, R. C. (1999). Sexual Dysfunction in the United States. *JAMA*, *281*, 537 – 544.

Laurent, S. M., Simons, A. D. (2009). Sexual dysfunction in depression and anxiety: Conceptualizing sexual dysfunctions as part of an internalizing dimension. *Clinical Psychology Review*, *29*, 573 – 585.

Machado-Vieira, R., Baumann, J., Wheeler-Castillo, C., Latov, D., Henter, I. D., Salvadore, G., & Zarate Jr., C. A. (2010). The timing of antidepressant effects: A comparison of diverse pharmacological and somatic treatments. *Pharmaceuticals*, *3*, 19 – 41.

Manthey, L., van Loenen-Frosch, F., Giltay, E. J., van Veen, T., Glashouwer, K., Penninx, B. W. J. H., Zitman, F. (2014). High dose benzodiazepines prolong RTs in chronic users who have major depressive and anxiety disorders. *British Journal of Clinical Pharmacology*, *77*, 571 – 577.

Marcusson-Clavertz, D., Kjell, O. N. E., Persson, S. D., Cardeña, E. (2019). Online validation of combined mood induction procedures. *PLOS ONE*, *14*.

Masters, W. H., & Johnson, V. E. (1970). *Human sexual inadequacy*. Boston, MA: Little, Brown

Mayer, J. D., Allen, J. P., & Beauregard, K. (1995). Mood induction s for four specific moods: A procedure employing guided imagery vignettes with music. *Journal of Mental Imagery*, *19*, 151 – 159.

McCall, K. M., Rellini, A. H., Seal, B., & Meston, C. M. (2007). Sex differences in memory for sexually- relevant information. *Archives of Sexual Behavior, 36,* 518-530.

Melynk, J. W., McCord, D. M., Vaske, J. (2014). Gaze pattern variations among men when assessing female attractiveness. *Evolutionary Psychology, 12*, 167 – 177.

Michael, A., O'Keane, V. (2000). Sexual Dysfunction and Depression. *Human Psychopharmacology: Clinical and Experimental*, *15*, 337 – 345.

Mogg, K., Bradley, B. P. (2002). Selective orienting of attention to masked threat faces in social anxiety. *Behaviour Research and Therapy*, *40*, 1403 – 1414.

Mogg, K., McNamara, J., Powys, M., Rawlinson, H., Seiffer, A., & Bradley, B. P. (2000). Selective attention to threat A test of two cognitive models of anxiety. *Cognition and Emotion*, *14*, 375 – 399.

Mogg, K., Philippot, P., Bradley, B. P. (2004). Selective attention to angry faces in clinical social phobia. *Journal of Psychopathology and Clinical Science*, *113*, 160 – 165.

Mondaini, N., Ponchietti, R., Gontero, P., Muir, G. H., Natali, A., Caldarera, E., … Rizzo, M. (2002). Penile length is normal in most men seeking penile lengthening procedures. International Journal of Impotence Research, 14(4), 283–286.

Moray, N. (1969*). Listening and attention*. Penguin Books.

Münte, T. F., Heinze, H. J., Matzke, M., Steitz, J. (1993). Effects of oxazepam and an extract of kava roots (piper methysticum) on event-related potentials in a word recognition task. *Neuropsychobiology*, *27*, 46 – 53.

Nobre, P. J. (2010). Psychological determinants of erectile dysfunction: Testing a

Nobre, P. G., Pinto-Gouveia, J. (2009). Questionnaire of cognitive schema activation in sexual context: A measure to assess cognitive schemas activated in unsuccessful sexual situations. *Journal of Sex Research*, *46*, 425 – 437.
cognitive-emotional model. *Journal of Sexual Medicine*, *7*, 1429-1437.

Öhman, A., & Mineka, S. (2001). Fears, phobias, and preparedness: Toward an evolved
module of fear and fear learning. *Psychological Review*, *108*, 483–522.

Oppong, F. B., & Agbedra, S. Y. (2016). Assessing univariate and multivariate normality: A guide for non-statisticians. *Mathematical Theory and Modeling*, *6*, 1-11.

Orosy-Fildes, C., & Allan, R. W. (1989). Psychology of computer use: XII. Videogame play: Human RT to visual stimuli. *Perceptual and Motor Skills*, *69*, 243–247.

Park, B. Y., Wilson, G., Berger, J., Christman, M., Reina, B., Bishop, F., . . . Doan, A. P.
(2016). Is internet pornography causing sexual dysfunctions? A review with clinical reports. *Behavioral sciences*, *6*, 17.

Rellini, A. H., McCall, K. M., Randall, P. K., Meston, C. M. (2005). The relationship between women's subjective and physiological sexual arousal. *Psychophysiology*, *42*, 116 – 124.

Rellini. A. H., Meston, C. M. (2011). Sexual self-schemas, sexual dysfunction, and he sexual responses of women with a history of childhood sexual abuse. *Archives of Sexual Behavior*, *40*, 351– 362.

Rosen, R. C., Riley, A., Wagner, G., Osterloh, I. H., Kirkpatrick, J., & Mishra, A. (1997). The International Index of Erectile Function (IIEF): A multidimensional scale for assessment of erectile dysfunction. *Urology*, *49*, 822–830.

Rosen, R. C., Cappelleri, J. C., Gendrano, N.(2002). The international index of erectile function (IIEF): A state-of-the-science review. *International Journal of Impotence Research*, *4*, 226 – 244.

Rothman, N. B., Pratt, M. G., Rees, L., & Vogus T. J. (2017). Understanding the duel nature of ambivalence: why and when ambivalence leads to good and bad outcomes. *Academy of Management Annals*, *11*, 33 – 72.

Rupp H. A., Wallen K. (2009). Sex-specific content preferences for visual sexual stimuli. *Archives of Sexual Behavior*, *38*, 417-26.

Rupp H. A., Wallen K. (2007). Sex differences in viewing sexual stimuli: an eye-tracking study in men and women. *Hormones and Behavior*, *51*, 524-33.

Rusbult, C. E., Martz, J. M., & Agnew, C. R. (1998). The investment model scale: Measuring commitment level, satisfaction level, quality of alternatives, and investment size. *Personal Relationships*, *5*, 357–391.

Sand, M., Fisher, W. A. (2007). Women's endorsement of models of female sexual response: The nurses' sexuality study. *The Journal of Sexual Medicine*, *4*, 708 – 719.

Seehuus, Martin. (2015). Discrepant attentional biases toward sexual stimuli [Doctoral dissertation, University of Vermont]. UVM Scholarworks.

Selfridge O.G. (1959) Pandemonium: A Paradigm For Learning**.** In: Blake D.V. Uttley A.M. Proceedings of the Symposium on Mechanization of Thought Processes. H.M. Stationary Office, 1959: 511-529.

Spiering, M., Everaerd, W., & Janssen, E. (2003). Priming the sexual system: Implicit versus explicit activation. *Journal of Sex Research*, *40*, 134–145.

Stuss, D. T., Stethem, L. L., Picton, T. W., Leech, E. E., & Pelchat, G. (1989). Traumatic brain injury, age and RT. *Canadian Journal of Neurological Science*, *16*, 161–167.

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

Treisman, A. (1960). Contextual cues in selective listening. *Quarterly Journal of Experimental Psychology*, *12*, 242–248.

Treisman, A. (1986). Features and objects in visual processing. *Scientific American*, *255*, 106–115.

Treisman, A. (1969). Strategies and models of selective attention. *Psychological Review*, *76*, 282–299.

Wiegel, M., Scepkowski, L. A., & Barlow, D. H. (2007). Cognitive- affective processes in sexual arousal and sexual dysfunction. In E. Janssen (Ed.), *The*

psychophysiology of sex (pp. 143–165). Bloomington: Indiana University Press.

Wilson, T. D., Lisle, D. J., Kraft, D., & Wetzel, C. G. (1989). Preferences as expectation-driven inferences: Effects of affective expectations on affective experience. *Journal of Personality and Social Psychology*, *56*, 519–530.

Woolridge, J. M. (2013). *Introductory Economics: A modern approach* (5th ed., pp. 275 – 278). South-Western Cengage Learning.

Wyatt, R. B., de Jong, D. C., Holden, C. (2018). Spectatoring mediates the association between penis appearance concerns and sexual dysfunction. *Journal of Sex and Marital Therapy*, *45*, 328 – 338.

Wyatt, R. B., de Jong, D. C. (2020). Anxiousness and distractibility strengthen mediated associations between men's penis appearance concerns, spectatoring, and sexual difficulties: A preregistered study. *Archives of Sexual Behavior*, *49*, 2981 – 2992.

Wyatt, R. B., Rellini, A. (In Preparation). The inventory of ambiguous sexual faces (IASF): Development and validation.

Wyatt, R. B. (2023). Differences in attentional processing of sexual stimuli for men with varying degrees of sexual arousal function. Graduate College Dissertations and Theses. 1712.

Zhang, Z., Zyphur, M. J., Preacher, K., Bird, L. J. (2019). Moderated mediation in multilevel structural equation models: Decomposing effects of race on math achievement within versus between high schools in the United States. In S. E. Humphrey & J. M. LeBreton (Eds.), *The handbook of multilevel theory, measurement, and analysis* (pp. 473 – 494). American Psychological Association.