Identifying objective markers of sexual arousal: Using eye-tracking, pupillometry, and heart rate variability

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Abstract

Identifying Objective Markers of Sexual Arousal: Using Eye Tracking, Pupillometry, and Heart Rate Variability

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Sexual arousal has long been defined as a mind/body connection that consists of experiencing both subjective awareness of one's sexual arousal and the subsequent genital response (Schacter & Singer, 1982). However, new research interested in this construct has demonstrated that not everyone experiences sexual arousal in the same way. Notably, women often do no experience this mind/body connection, where they experience a lack of concordance between their subjective and objective sexual arousal (Chivers & Bailey, 2005; Chivers, 2010). For example, experiencing vaginal engorgement when not subjectively aroused. Traditional objective measures (e.g. vaginal plethysmography) can capture these genital responses that do not reflect subjective appraisals. The purpose of this thesis is to explore different objective measures (i.e.: Eye Movement Variability; EMV, Pupillometry, and Heart Rate Variability; HRV) in the aim of finding one that would measure objective sexual arousal that was concordant with the subjective experience. The results of this experiment allowed us to determine that HRV may only be a suitable objective measure for assessing negative affect. In addition, they show that negative arousal may decrease EMV as positive arousal can. Finally, there was a correspondence between pupillary responses and arousing instances. Unfortunately, due to statistical limitations, we were unable to find quantitative correspondences between the subjective and objective assessments. Additionally, we were interested in the use of video stimuli instead of images. Where these do offer notable advantages such as time efficiency and the possibility of presenting a large array of stimuli, they lack ecological validity. With the addition of sound and a storyline, videos may offer more context and may also elicit stronger emotive responses (Rupp & Wallen, 2008). As such, we aimed to create a bank of validated videos. Results of this experiment allowed us to obtain the videos used for the second study of this thesis.

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CONTRIBUTION OF AUTHORS

This dissertation consists of a general introduction and two experimental chapters. All sections were written with general feedback from my supervisor, Dr. Aaron Johnson. Several undergraduate students contributed to the collection of data. The co-authorships are defined below.

Chapter 2: Validation of Sexually Explicit Video Segments

Karine Elalouf, Simon A. Houle, & Aaron P. Johnson

Chapter 3: Identifying Objective Markers of Sexual Arousal: Using Eye Tracking, Pupillometry, and Heart Rate Variability

Karine Elalouf, Corina Lacombe, Zoey Stark, & Aaron P. Johnson

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Chapter 1: General Introduction

Research in the field of Human Sexual Behaviour has long been riddled with conflicting findings that continuously raised questions about the beliefs associated to this topic. Indeed, the older theories that dominated this field described sexual behaviour as a rather crude and primordial human component. For example, sexual interactions between men and women have been described in terms of Game Theory (Fisher, 1982; Thornhill & Palmer, 2000; Pinker, 2002), where social interactions are described in terms of a game whereby both parties seek to maximize gain from all possible interactions (Colman, 2013). In terms of sexual interactions specifically, gains for men would fall under spreading as much of their genes, with the aim of having as many offspring as possible, whereas gains for women would entail keeping a man for his resources that would be needed to ensure a good and safe environment for her children to grow (Pinker, 2002).

But is this really the case? Sex researchers have begun to develop other theories of human sexual behaviour. Researchers such as Masters and Johnson (1966), Kaplan (1974), and Georgiadis and Kringelbach (2012) aimed to better understand the basics of sexual behaviour by studying the workings of the sexual act itself. This research avenue was first pioneered by Masters and Johnson (1966), who brought about the development of what is now referred to as *The Model of Human Sexual Response,* also known as the "EPOR" model (Masters & Johnson, 1966). The model posits that, during sexual intercourse, both men and women will experience four phases that are labeled as: Excitation (E), Plateau (P), Orgasm (O), and Resolution (R), with variations of expression within each of these phases that differ for men and women (Masters & Johnson, 1966). For example, they found that women may have multiple orgasms within the same sexual experience, or conversely may not experience one at all (Masters & Johnson, 1966). This model that pioneered a new age in the study of sexual behaviour prompted subsequent researchers to propose theories and models of their own to explain human sexual responses (i.e.: Kaplan, 1974; Basson, 2000). In doing so, they poked holes in the EPOR model (Masters & Johnson, 1966) by mainly focusing on the fact that the model proposed by Masters and Johnson (1966) failed to include the psychological aspect of human sexual responses. One that gained much attention was the Female Sexual Response proposed by Kaplan (1974), which originated from her work on the treatment of sexual disorders. Through this work, she identified that the dysfunctions her patients experienced fell into one of three categories. As such, her model suggests that there are only three, as opposed to four, interlocking phases of the sexual response cycle: Desire, Excitement, and Orgasm. She outlined that the EPOR model (Masters & Johnson, 1966) failed to consider that women's sexual psychophysiology is quite reliant on how they experience sexual interactions psychologically. As such, she included the phase of desire as a prelude to the physiological component of sexual response. However, with the evolution of research on sexual behaviour and dysfunctions came the need for an evolution in these models. From this Basson (2000) put forward a circular model of sexual response that highlights how the psychological and physiological components of sexual behaviour interact. It acknowledges both the biological and cognitive/emotional factors that make up sexual behaviour by focusing on learning and reward mechanisms, providing a more holistic model of sexual responses.

Pioneering studies such as these that have produced these models have provided the field of Sexual Behaviour with heuristics that have guided subsequent research in the aims of better understanding human sexual responses. An example of this can be seen in the development of several sub-fields, such as Sexual Deviances and Paraphilia's (e.g.: Côté, Earls, & Lalumière, 2002; Earls & Lalumière, 2009; Joyal, 2015; Joyal & Carpentier, 2016) and Neurobiological functions of Sexual Behaviour (e.g.: Pfaff, 1999; Pfaus, 1999; Pfaus & Scepkowski, 2005; Paredes, 2009). It has also triggered research relating to the understanding and concretization of specific constructs that are crucial to the understanding of sexual behaviour. One such construct, Sexual Arousal has received attention in the aim of both understanding and defining it. Sexual arousal has been defined as a "mind/body" connection that consists of two main functions: subjective awareness of one's sexual arousal, and a physiological genital response (Schacter & Singer, 1962). Researchers have focused on sexual arousal, studying it from a physiological and psychological perspective (Georgiadis & Kringelbach, 2012), as well as how the subjective and objective interact (e.g.: Schacter & Singer, 1962; Rosen & Beck, 1988; Chivers, Reiger, Latty, & Bailey, 2004). However, emerging research has raised concerns regarding how the objective and subjective component of this definition interact, as well as how this interaction changes as a function of several factors such as: sex, gender, and sexual orientation (e.g.: Chivers, Seto, & Blanchard, 2007; Chivers, Seto, Lalumière, Laan, & Grimbos, 2010; Farisello et al., 2017).

1.1. Subjective Sexual Arousal

The use of subjective measures has played an integral role in the study sexual arousal. Indeed, as gathered from the evolution of the models of human sexual response previously discussed, many researchers posited that the psychological component of sexual behaviour is an essential part of how we respond to sexual circumstances (e.g.: Kaplan, 1974; Basson, 2000;

Georgiadis & Kringelbach, 2012). Indeed, the inclusion of subjective measures of sexual arousal in research has allowed for a better understanding of people's cognitions about their sexual experiences and how they respond to sexual incentives. These measures assess an individuals' awareness of their sexual arousal through questionnaires, likert scales, or even simple questions for overall evaluation (e.g. Rate your level of sexual arousal on a scale from 1 to 10). Additionally, many measures were created with the aim of understanding different aspects of sexual arousal. For example, Derogatis Sexual Functioning Inventory (DSFI; Derogatis & Melisaratos, 1979) is a questionnaire aimed to address overall sexual functioning, which can have an impact on one's sexual arousal. Others, such as the Sexual Arousal and Desire Inventory (SADI; Toledano & Pfaus, 2006), were created to directly measure sexual arousal as a construct.

Although subjective measures are crucial to the understanding of participant affect, they are not without their limitations. A first one that is rather unavoidable in Sex Research is sampling bias (Catania, McDermott, & Pollack, 1986). Notably, individuals who willingly participate in sex research are likely to be more comfortable in taking part in such a study due to being open and comfortable about their sexuality and sexual experiences (Strassberg & Lowe, 1995). Response bias is a second limitation that one faces when using subjective measures. With relation to sex research, response bias is usually a product of fear and judgment, where participants will either inflate or deflate their responses due to socially imposed judgement (Alexander & Fisher, 2003). In an attempt to overcome these limitations, researchers often combine the use of physiological measures in conjunction to subjective ones.

1.2. Objective Measurements of Sexual Arousal

As well as subjective ratings, objective measures tailored to record physiological activity, specifically genital activity, are also utilized to study sexual arousal. Devices such as photoplethysmography (Bancroft, Jones & Pullan, 1966; Freund, Knob, & Sedlacek, 1965; Chivers, 2010; Chivers & Bailey, 2015) and thermography (e.g. Abramson, Perry, Talbot Seeley, Masters Seeley, & Rothblatt, 1981; Kukkonen, Binik, Amsel, & Carrier, 2007) are commonly used to measure genital activity. Specifically, they work to measure changes in genital blood flow, a process that is controlled by the autonomic nervous system (ANS), which is made up of both the sympathetic nervous system (SNS) and the parasympathetic nervous system (PNS). In a first instance, the SNS plays the role of preparing the body to engage with an arousing situation, either good or bad (Pfaus, Scepkowski, Marson, & Georgiadis, 2014). It does so by shifting the body's homeostatic and cardio-vascular mechanisms, causing an increase in heart rate and blood pressure (allowing better circulation of oxygen to the body), dilation of pupils (permitting more processing of the visual field), constricting of blood vessels, etc. (Pfaus et al., 2014). Following this, the PNS activates to bring the body back to a state of homeostasis (Pfaus et al., 2014). With regards to sexual responses, the SNS is said to activate first as a response to sexual instances that cause an increase in arousal. For example, the increase in blood pressure is in part responsible for a male erection and engorgement of the vagina in women (Pfaus et al., 2014). The maintenance of these states occurs when the PNS is activated, as this phase is responsible for maintaining blood in dilated cavernously blood vessels, which are found in both the penis and the vagina (Pfaus et al., 2014). Following this, upon the climax of the sexual interaction (i.e.: sexual intercourse, masturbation), the SNS resumes control, as it is responsible for ejaculation and orgasm (Pfaus et al., 2014).

Photoplethysmography is one of the tools that directly measure genital arousal. For men, it measures the engorgement of the penis via a penile strain gauge that is placed around the penile shaft (Bancroft, Jones & Pullan, 1966), or vaginal engorgement through a tampon-like light-emitting apparatus called a photometer that is placed inside the vagina for women. Both quantify the level of engorgement through an increase in gauge tension caused either by penile tumescence, or by decreased light emission caused by vasocongestion in the vagina. Another tool frequently used to assess genital arousal is genital thermography. Contrary to photoplethysmography, this instrument measures changes in external genital temperature via the use of a thermographic camera. Shifts in temperature are attributed to an influx in core blood to the genitals as a response to the stimuli being viewed.

There are however some disadvantages to using these physiological tools. First, the use of the plethysmograph engenders the “one size fits all” dilemma, where the strain gauge or photometer may not be of an ideal size for the participant. For example, the photometer may be too small and thus will not capture the full extent of the participants’ vaginal engorgement. Conversely, the strain gauge may be too big to measure the participants’ full erection. As such, this problem may lead to improper assessment of genital arousal. Further, for men, an erection initially changes the penile length followed by the girth. This translates into a possible delay in physiological response. Further, the act of placing the strain gauge over the penis may cause initial genital arousal, indicating that the physiological response may be partially due to the instrument itself (Freund, Knob, & Sedlacek, 1965). With regards to genital thermography, this technique is still thought to be in its infancy (Farisello et al., 2017). In addition, there is a short lag time between internal blood flow and external heat recordings, decreasing the temporal resolution of this metric (Farisello et al., 2017).

1.3. The Concordance Problem

Researchers have raised concerns that genital arousal may not necessarily be associated with subjective arousal for all individuals. Several studies have demonstrated that heterosexual men and women differ in their objective responding to sexual stimuli. Specifically, it has been shown that, unlike men, women exhibit a genital arousal to stimuli that they themselves did not find subjectively sexually arousing (Chivers, Rieger, Latty, & Bailey, 2004; Chivers & Bailey, 2005; Chivers, Seto, & Blanchard, 2007; Chivers, 2010; Spape, Timmers, Yoon, Ponseti, & Chivers, 2014). These studies have demonstrated that heterosexual women will exhibit discordance between their subjective and objective sexual responding, where they may experience labial engorgement and vaginal lubrication to sexual stimuli that they subjectively do not prefer. Contrarily, heterosexual men do not exhibit this discordance, as their physiological responses to non-preferred stimuli match their subjective assessments.

Researchers have speculated as to why this discordance between objective and subjective measures of arousal is occurring. A possible reason that has been explored falls under the notion that women are often unaware of their own genital arousal, since the changes in physiology are internal (e.g., vaginal blood flow: Chivers & Rosen, 2010). Generally, female genital arousal is not as overt a men's, who receive far more visual and sensory feedback from the erection of their penis on the outside of the body. As such, without sensations such as pressure felt due to clothing restricting an erection, or perceptions such as a penis visually growing, women do not receive much feedback from their genital arousal. Another explanation falls under the realm of evolution. A theory titled the "Preparation Hypothesis" has been put forward to explain the lack of sexual concordance that women experience (Bancroft & Graham, 2011; Dawson, Suschinsky, & Lalumière, 2013). Specifically, it outlines that that being primed for any sexual encounter is an evolution benefit for women. As such, an increase in vaginal lubrication even in the absence of subjective sexual arousal or desire may be adaptive for women in order to be prepared for any sexual contact, wanted or unwanted.

1.4. The Concordance Problem: Eye Tracking

This then begs the question; does genital arousal mean sexual arousal? It would appear as though, for women, this is not the case. The lack of concordance between objective and subjective arousal that women experience has raised questions about much of what has been assumed by past researchers regarding sexual arousal. This lack of mind/body connection that is central to the definition of sexual arousal, and has forced researchers to rethink the forms of physiological measures used to assess objective arousal in women.

One possible answer to the question of concordance may lie in better understanding what the individual is looking at when they start to perceive a psychological or physiological arousal. As such, one measure that has gained much popularity over the last decade is that of eye tracking methodologies (Wenzlaff, Briken, & Dekker, 2016). According to a literature review conducted by Wenzlaff and colleagues (2016), the use of eye tracking for sex research brings forward a multitude of benefits. Specifically, they outline that eye tracking can be used as a measure of overt visual attention (i.e., the act of selectively attending to an item or location over others by moving the eyes to point in that direction), which can offer researchers insight into an individual's intentions when viewing sexual stimuli, whether preferred or non-preferred (Wenzlaff et al., 2016). Additionally, this measure can also shed light on sex and sexual orientation differences when faced with sexual stimuli (Wenzlaff et al., 2016). Indeed, researchers in the field of sex research have begun using eye movement patterns to differentiate when individuals are looking at sexual vs. non-sexual stimuli. For example, the first researchers to utilize eye tracking when viewing erotic or non-erotic images found that participants fixated more frequently, and for longer durations on erotic images compared to their non-erotic counterparts (Lykins, Meana, & Kambe, 2006). Additionally, Nummenmaa, Hietanen, Santtila, & Hyönä, (2012) found that when viewing images of clothed individuals, participants had a higher tendency of looking at the faces first. Conversely, they found that when looking at images of naked individuals, participants tended to fixate on pelvic and chest regions first (Nummenmaa et al., 2012).

In addition to this, researchers have begun to use eye-tracking paradigms to explain the concordance problem, by collecting eye movement data when men and women view preferred and non-preferred stimuli (i.e., for heterosexual males, images of women would be the preferred stimuli, and images of men would be the non-preferred). Overall, researchers have demonstrated that not only do men and women have different viewing patterns when presented with preferred and non-preferred erotic images, but that they process these images differently as well (Dawson & Chivers, 2016; Farisello et al., 2017). Specifically, at early stages of processing, women demonstrate a lack of specificity in visual attention when viewing both preferred and non-preferred erotic images (Dawson & Chivers, 2016; Farisello et al., 2017). However, this changes when in the later stages of processing, as women being to demonstrate specific visual attention towards their preferred stimuli (Dawson & Chivers, 2016). Conversely, men exhibit the same specific visual attention toward their preferred erotic images during both early and later stages of processing (Dawson & Chivers, 2016; Farisello et al., 2017). It has been hypothesized that women's initial visual attention patterns might be linked to their nonspecific genital responses, further adding a piece to the concordance puzzle (Dawson & Chivers, 2016).

However a limitation worth noting about these studies is the type of stimuli used to elicit the desired responses. Specifically, the vast majority of the research conducted employing eye-tracking methodologies utilizes static erotic pictures as stimuli. Although easier to analyse and interpret, using static pictorial stimuli has been argued to lack in ecological validity in comparison to dynamic stimuli such as videos (Martin, 1990; Gross & Levenson, 1995; Tsujimura et al., 2009; Schaefer, Nils, Sanchez, & Philippot, 2010). In order to improve on this limitation, a select few researchers have ventured away from pictures to video-based stimuli in conjunction to using eye tracking (Tsujimura et al., 2009; Farisello et al., 2017). One such was a study conducted by Tsujimura et al., (2009) who utilized eye tracking while individuals watched erotic videos in order to investigate whether sex differences in visual attention exist. Male and female participants were asked to view two short erotic videos while being eye tracked. The first video consisted of a naked heterosexual couple kissing, and the other of a heterosexual couple engaging in intercourse. For the first video clip, the researchers observed that men experience longer gaze times for the face and body of the female actress than for the male actor compared to women. In contrast, female participants experienced longer gaze time for the face and body of the actor in this clip compared to men. For the second video clip however, no significant differences in eye movement patterns and gaze times were found. The authors concluded that sex differences may be present during less arousing scenes, but are less pronounced when the stimuli are more explicit.

A few limitations of this study are of note. To begin, due to the pornography laws in Japan, all of the actors' genitalia were pixelated out in the video clips. This could evidently reduce the ecological validity of the study in question. In addition, no standardized measure of subjective sexual arousal was used to determine if the presented video clips indeed sexually aroused participants. Further, the video clips used were chosen by the researchers, and had not been previously validated for arousal in both heterosexual males and females, putting further into question the ecological validity as well as the subjective arousal of the participants in this study.

Given these limitations, the studies presented in this thesis sought to improve on these by first creating a bank of erotic video clips that had been validated, by being rated for arousal and valence across multiple heterosexual male and female participants. In addition, the use of standardized desire, arousal and valence scales were implemented in addition to the use of eye tracking methodologies in an attempt to relate both subjective and objective arousal to better understand the concordance problem.

1.5. The Concordance Problem: Pupillometry

Complimentary to the use of eye movement data, and in an effort to further understand the female concordance issue, pupillometry has been used as an objective measure in the study of sexual arousal. Pupillometry is the measurement of pupil size and reactivity (Laeng, Sirois, & Gredebäck, 2012). In a first instance, pupil dilation and constriction can be controlled via the "pupillary light reflex", such that incoming light into the eye will cause pupil constriction and lack of light pupil dilation. However pupillary responses can also be controlled by a variety of cognitions and emotional states. For example, pupillary changes have been found to be associated with differences in cognitive load (e.g., Hess & Polt, 1964; Beatty & Kahneman, 1966; Bradshaw, 1968). With regards to emotional states, researchers in the early 1960's demonstrated that pupillary changes could occur due to arousing instances (e.g., Hess & Polt, 1964; Simms, 1967; Nunnally et al., 1967). For example, some of the first pupillometry studies demonstrated that in both sexes, pupils dilated when viewing pictures of people of the opposite sex (Hess & Polt, 1964; Simms, 1967; Nunnally et al., 1967). It has been shown that this dilation (and constriction) of the pupil is controlled by the Autonomic Nervous System, where pupil dilation is associated to an increase in sympathetic activity, and constriction controlled by the parasympathetic activity (Bradely, Miccoli, Escrig, & Lang, 2008). Researchers have attempted to use this technique as a way of measuring objective arousal. Several bodies of research have surmised that an increase in pupil dilation can occur at the presence of both positively and negatively arousing instances, however some have found notable differences when taking sex into account. For example, Nunnally and colleagues (1967) found that seeing slides rated as 'very pleasant' was associated with greater pupil dilation as seeing slides rated as neutral or very unpleasant. More recently, research conducted by Finke, Deuter, Hengesch, and Schächinger (2017) found that men experience an increase in pupil dilation when viewing photographs of the opposite-sex after a few seconds of viewing time, what the researchers denote as the later stages of image processing. Conversely, women showed a non-specific response when viewing these images in the later stages of image processing, such that pupillary changes did not significantly differentiate for same- and opposite-sex images. One of the main limitations of this study however includes the lack of a negatively arousing stimulus in order to compare pupillary responses to a positively arousing stimulus. In contrast, the studies presented in this thesis utilized both positively arousing and neutral stimuli, as well as negatively arousing stimuli.

1.6. The Concordance Problem: Heart Rate Variability

The use of heart rate as an objective measure has recently regained popularity in sex research (e.g., Bos, Jentgens, Beckers, & Kindt, 2013; Maffei, Vencaton, & Angrilli, 2015). Starting with the basics, changes in cardiac rhythm are controlled by the Autonomic Nervous System (ANS). Specifically, this system consists of three divisions, two of which directly affect both heart rate and sexual responding (Pfaus, Scepkowski, Marson, & Geordiadis, 2014); the Sympathetic Nervous System (SNS) and the Parasympathetic Nervous System (PNS). Beginning with the SNS, this division is responsible for the regulation of the mechanisms of homeostasis as well as cardiovascular functions when faced with a stressful situation (Pfaus et al., 2014). However, in this instance, the stressful situation can be either negative stress or positive stress. In either situation, the SNS will increase heart rate and blood pressure, which will initiate an increase in pupil dilation, constrict blood vessels and inhibit digestion (Pfaus et al., 2014). With regards to sexual responding, which falls under the category of positive stress, the SNS is also responsible for ejaculation and orgasm (Pfaus et al., 2014). In contrast, the PNS directly opposes the SNS, such that is calms the system down after an instance of stress. As its opposite, the PNS is responsible vessel dilation. This is crucial to sexual responding, as stimulation to the penis, vagina, clitoris, and other erogenous erectile tissue requires an increase in blood flow to these areas during sexual encounters (Pfaus et al., 2014). The PNS is also responsible for the draining of these vessels of these tissues after orgasm (Pfaus et al., 2014).

Given the direct relationship between experiencing positive stress and increase in heart rate, many researchers have looked to changes in heart rate as a form of objective measure for physiological arousal. The first uses of this metric determined that when sexually aroused and confronted with sexual instances, both men and women experience an increase in heart rate, as measured in beats per minute or blood pressure (Masters & Johnson, 1966; Wenger, Averill, & Smith, 1968; Krüger, Exton, Pawlak, von zur Mülen, Hartmann, & Schedlowski, 1998). However, researchers soon found a fundamental flaw with this measure. Although increase in beats per minute is associated to experiencing positive stress as elicited by erotic stimuli, heart rate would also increase at the presence of negative stimuli (Tomaka, Blascovich, Kibler, & Ernst, 1997; Pfaus et al., 2014). Due to this lack of differentiation, heart rate – as measured in beats per minute - has lost its popularity as being used as a way of measuring objective sexual arousal.

As a result of this, researchers have moving away from simply looking at the heart rate beats per minute, to investigating how the variability of a heart beat could be associated to affective responding (Thayer, Åhs, Fredrickson, Sollers, Wager, 2012). Also known as inter-beat intervals, heart rate variability (HRV) measures the variability in the time interval between successive heart beats, usually calculated between the systolic peaks between adjacent heart-beats, and is most commonly used in studying stress and emotion regulation. As a result of this measurements' popularity, Thayer, Åhs, Fredrickson, Sollers, & Wager (2012) conducted a meta-analyses in order shed some light on the implications of HRV as a marker of stress and health. The authors first begin by outlining that emotion regulation is necessary when attempting to adapt to one's environment. The manner in which one goes about this process is said to reflect the status of one's on-going appraisal of a constantly changing environment, but that not everyone responds the same way (Thayer et al., 2012). Indeed, current research on stress has been investigating the association between the two, and found that HRV can be used to identify two types of individuals with regards to affective responding: (1) people with good emotional appraisals and regulation, and (2) people with poor emotional appraisals and regulation (Thayer et al., 2012). Those falling under the first category were found to exhibit high-frequency HRV (HF-HRV) at baseline; where as those falling under the second category have low-frequency HRV (LF-HRV) at baseline (Thayer et al., 2012). As such, those with HF-HRV appear to have an easier time dealing with negatively stressful situations as opposed to their LF-HRV counterparts. They further outline that, through several imaging studies, the brain areas that are involved with emotion regulation as well as emotional appraisal are the amygdala several sub-regions of the medial pre-frontal cortex. Authors then speculated that HRV may be linked to successful emotion regulation via these brain regions. Further, as individuals with LF-HRV are not as successful in their emotional appraisals and regulations as opposed to those with HF-HRV, the authors put forward that HRV may be an index of how our "core integration" system is working (Thayer et al., 2012).

As such, knowing that LF-HRV has been shown to be an indicator of poor emotional regulation and appraisal and HF-HRV as the opposite of this with regards to negative stress, the next logical avenue for this measure would be to apply it to instances of positive stress. The following proposed studies aim to utilize the information gathered about HRV and apply it to a variety of erotic videos ranging in arousal and valence ratings.

1.7. Validation of Video Stimuli

Just as the use of appropriate objective measures is vital to the study of sexual behaviour, so is the use of proper stimuli. Specifically, the employment of previously validated images and/or videos is an aspect of the experimental procedure that is often overlooked by researchers. As a result of this, several databases of validated images have come about that have even gone beyond sexual imagery. Focusing on erotic images however, commonly used image banks include the Nencki Affective Picture System (NAPS; Marchewk et al., 2014), the International Affective Picture System (IAPS; Lang, Bradley & Cuthbert, 2006), and the Concordia Sexual Image Database (Shilhan, Johnson, & Pfaus, 2012). The development of these databases demonstrates a shift in the right direction with regards to the study of sexual behaviour. However, although a number of databases have been developed for emotive research (e.g., Uhrig et al., 2016; Gilman et al., 2017), no databases have been created with validated erotic videos. A meta-analysis conducted by Rupp and Wallen (2008) exploring sex differences in response to visual sexual stimuli determined that men and women respond to different characteristics of the erotic stimuli that affect their sexual arousal. On the one hand, men are influenced by the sex of the actor, and prefer erotic stimuli that allow them to projecting themselves into the scenario while objectifying the actor (Rupp & Wallen, 2008). On the other, women are more variable based on the context of the stimuli itself, but also enjoy projecting themselves into the stimuli (Rupp & Wallen, 2008). With this in mind, using video stimuli would allow individuals to project themselves into the storyline of the video, perhaps increasing the cognitive and physical sexual arousal. However, there has been a counter argument that videos do not cause any more emotional responses than do images (Uhrig et al., 2016), and as such we will keep this in mind when interpreting the results.

With this in mind, the following studies not only intend on creating a set of validated video segments to add to the existing databases of validated stimuli, but also improving previous methodology by using these validated videos in experimental procedures with the aim of overcoming the limitations previously outlined.

1.8. Project Proposal

The purpose of the current thesis is two-fold. To begin, it aims to create a validated set of video clips. As previously discussed, the use of validated stimuli in any research experiment is a central component to the integrity of the experiment. Without such stimuli one risks the chance of obtaining a smaller effect than could have been observed, or simply fail to elicit the desired response overall. Additionally, no database of validated sexually explicit videos has yet been created. As a result, in the first experiment of this thesis a series of short pornographic video segments, containing a variety of sexual interactions as well as orientations, were complied in order to be participant rated.

With the use of these validated video clips we were able to conduct the second experiment of this thesis, which was concerned with study of subjective and objective sexual arousal. Previous research interested in sexual arousal commonly use vaginal/penile plethysmography (Bancroft, Jones & Pullan, 1966; Freund, Knob, & Sedlacek, 1965; Chivers, 2010; Chivers & Bailey, 2015) and/or genital thermography (Abramson et al., 1981; Kukkonen et al., 2007) to measure objective sexual arousal. However, an increasing number of studies that have utilized these tools have shed light on the fact that, although both plethysmography and thermography capture genital arousal for both sexes, they do not do so for subjective arousal in women (Chivers, Rieger, Latty, & Bailey, 2004; Chivers & Bailey, 2005; Chivers, Seto, & Blanchard, 2007; Chivers, 2010; Spape, Timmers, Yoon, Ponseti, & Chivers, 2014). Specifically, research has demonstrated that a genital response in men concords with their subjective appraisal of the sexual incentive, such that when they are subjective aroused they are also objectively aroused (Chivers et al., 2010). Conversely, it has been shown that women's genital response does not always concord with their subjective appraisals the sexual stimuli (Chivers et al., 2010; Bouchard, Chivers, & Pukall, 2017).

As a result of this, the current study aimed to study other objective measures non-related to genital arousal in an attempt to find one that: (1) accurately assesses objective sexual arousal and (2) concords with women's subjective sexual arousal. The proposed objective measures that were under investigation are the following: Eye Tracking, Pupillometry, and Heart Rate Variability.

Chapter 2: Validation of Sexually Explicit Video Segments

Validation of Sexually Explicit Video Segments

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Introduction

Erotic images and/or videos are commonly used forms of stimuli when looking to study sexual arousal, as they can elicit measurable responses associated to this construct. For example, previous researchers utilizing these kinds of stimuli have sought to investigate the effect of sexually explicit images on physiological responses, such as vaginal and penile engorgement (e.g., Chivers et al., 2004). In addition, they have often been used in eye tracking paradigms. A recent review focusing on the merits of video-based eye tracking in sex research has highlighted that this technique, when used with an appropriate behavioural task, can provide information about how covert attention viewing patterns of participants differ when looking at erotic and non-erotic stimuli, as well as preferred and non-preferred erotic stimuli (Wenzlaff, Briken, & Dekker, 2016).

Although the use of erotic stimuli provides the possibility of promising advancements in the field of sex research, researchers are often confronted with a major challenge. That is, researchers often pick erotic stimuli themselves, and without validating them (e.g., Chivers et al., 2007, Tsujimura et al., 2009). In doing so, they inadvertently choose and use erotic stimuli that reflects their own personal preferences, which perhaps does not reflect those of their participants. A consequence of this is that the stimuli chosen may not evoke the desired sexual response within the participant. In addition, through the use of validated stimuli, researchers may cater to the population of interest. For example, research has demonstrated that preferences for visual sexual stimuli differ from heterosexual men and women. A meta-analysis conducted by Rupp and Wallen (2008) investigating sex differences in response to visual sexual stimuli determined that men and women respond differently to certain characteristics of visual erotic stimuli. Men were more influenced by the sex of the actor, and were found to be more sexually aroused when they were able to projecting themselves into the scenario while objectifying the actor (Rupp & Wallen, 2008). Women on the other hand were influenced by the context of the stimuli, and were sexually aroused when they too could project themselves into the scenario of the stimulus (Rupp & Wallen, 2008). This alone demonstrates how the type of stimuli cannot only effect sexual arousal, but also that different sets of individuals will prefer different kinds of erotic stimuli. Due to this concern, several efforts regarding the importance of participant-rated stimuli have been taken on behalf of some researchers (Lang, Bradley & Cuthbert, 2006; Marchewka, Zurawski, Jednoróg, & Grabowska, 2014). This effort has brought about several banks of standardized images such as the Nencki Affective Picture System (Marchewk et al., 2014), the International

Affective Picture System (Lang, Bradley & Cuthbert, 2006), and the Concordia Sexual Imagery Database (Shilhan et al. 2012).

Additionally, a few databases for video-based stimuli have also been created (Martin, 1990; Gross & Levenson, 1995; Schaefer et al., 2010). Unlike still images, videos maintain the ability to stimulate more than just visual processes. With the addition of sound and multiple images, videos may offer more context and may also elicit stronger emotive responses (Rupp & Wallen, 2008). Indeed, they maintain more ecological validity compared to images, as they are one step closer to real-life experiences. As such, they may facilitate the process of projecting oneself into the presented scenario and increase the speed at which individuals get sexually aroused.

Unfortunately, no video databases have been created for erotic films. However, the use of videos in sex research is not uncommon; for example, research conducted by Tsujimura et al., (2009) examined the effect of eye movement patterns while participants were viewing a pornographic film. They presented two scenes to their participants: nude and heterosexual kissing, and heterosexual intercourse. They found both differences and similarities in viewing patterns of both sexes. For example, differences include that during the kissing scene, men spent longer looking at the actresses face and body, whereas women looked more at the male face and body as well as surroundings of the scenes. Additional research conducted by Chivers, Seto, and Blanchard (2007) also utilized videos in order to further investigate the question of women's lack of subjective and objective concordance with regards to their sexual responses. They used a total of 18 video clips lasting 90s each that depicted a variety of sexual and nonsexual activities (i.e.: landscapes, non-human sexual activity, female nonsexual activity, male nonsexual activity, female masturbation, male masturbation, female-female intercourse, male-male intercourse, and male-female copulation). Participants were asked to view two exemplars of each video category while simultaneously recording their subjective responses. Additionally, genital responses were also being recorded using photoplethysmography throughout the viewing process. They found that, much like in previous research, physiological responses did not coincide with subjective responses, such that women experienced genital responses to a wide variety of stimuli such as bonobo copulation (Chivers, Seto, & Blanchard, 2007). In contrast, their subjective responses matched their sexual preference (Chivers, Seto, & Blanchard, 2007). However, although the researchers discuss gender differences both subjectively and objectively in some detail, they failed to discuss if the overall ratings of the videos, as well as if there were any significant difference between them. This is something that can be explored by future researchers using the newly validated video stimuli.

As such, use of video-based stimuli can offer just as much if not more information about sexual responses than images. However, before conducting further research utilizing both of these tools, it is first necessary to create a database of rated and standardized videos, much like those established for images. In this vein, the current study aimed to do just that. In the current study, a set of 33 videos clips separated into 6 different categories (i.e.: Heterosexual Intercourse, Felattio, Cunnilingus, Male-Male Intercourse, Female-Female Copulation, Naked nonsexual activity) lasting between 1 - 4 minutes in length were rated and validated.

Method

The research protocol was approved by the human research ethics board at Concordia University, in accordance with the Canadian Tri-Council policy statement of ethical conduct for research involving humans.

Participants

Participants were recruited through the Concordia University Psychology Participant Pool System. All of the participants gave informed consent (Appendix A), and received a participation credit for the Psychology Participant Pool. Participants we chose to consider for this study consisted of females only (N = 124), between the ages of 18 – 38 years old, M = 22.55, SD = 3.58. Via the use of the Kinsey Scale (Kinsey, Pomeroy, Martin, & Sloan, 1948), to determine sexual orientation, the dominant sexual orientation of this sample was found to be '0: *Exclusively Heterosexual'*, n = 68, 54.8%, followed by '1: *Predominantly Heterosexual, only Incidentally Homosexual'*, n = 38, 30.6%. All other participants who did not rate themselves as either '*Exclusively Heterosexual'* or '*Predominantly Heterosexual, only Incidentally Homosexual'* were removed from all analyses, n = 18, 14.6%. For full details regarding age, sex and sexual orientation of participants please refer to table 2.1. and 2.2.

Materials

All stimuli were presented on a 21" Viewsonic G225fb Cathode Ray Tube screen (Screen resolution of 1024 x 768 pixels, 100Hz refresh rate) on a 3.2GHz Dual-Core computer running Microsoft Windows 7.

Each video segment originated from various pornographic videos retrieved from numerous sources (e.g.: PornHub, Playboy, babes.com, webyoung.com, lesbea.com, nubilefilms.com, sweetheadvideo.com, williamhiggins.com, ragingstallion.com, sassysava.com, evilangel.com, elegantangle.com, etc.). As well, we obtained videos from Dr. Chivers, which have been used in previous publications (refs). All movies were edited via the use of iMovie, version 10.1. There were six possible video type conditions: Female on Male (i.e.: fellatio; video1: 2m03s, video2: 1m11s, video3: 2m07s, video4: 2m29s, videp5: 2m06s, *n* = 20), Male on Female (i.e.: cunnilingus; video1: 1m51s, video2: 3m32s, video3: 4m01s, video4: 2m13s, video5: 3m12s, video6: 1m30s, *n* = 20), Heterosexual Intercourse (video1: 2m35s, video2: 4m24s, video3: 3m40s, video4: 3m08s, video5: 1m29s, *n* = 22), Nonsexual naked activity (video1: 2m10s, video2: 3m14s, video3: 1m29s, video4: 3m20s, video5: 1m.29s, *n* = 24), Female – Female copulation (video1: 2m50s, video2: 2m32s, video3: 1m57s, video4: 2m32s, video5: 2m31s, *n* = 21), and Male – Male Intercourse (video1: 2m23s, video2: 1m30s, video3: 3m12s, video4: 3m27s, video5: 1m30s, video6: 2m01s, *n* = 23). Each video category was presented via Microsoft PowerPoint. Two PowerPoint's per video category were created, within which were the same set of videos but in different orders of presentation. Participants within each category were shown one of the two PowerPoint's, which were counterbalanced across all participants.

Measures

Demographics Questionnaire. The Concordia University Sexual History Questionnaire (Appendix 1) was administered to all participants prior to beginning the study. This questionnaire has an array of questions with regards to participant's sexual history, intercourse, intimacy, arousal, and the Kinsey Heterosexual-Homosexual Rating Scale (Kinsey, Pomeroy, & Martin, 1948).

Self-Assessment Manikin (SAM). For the purpose of the study**,** two Self-Assessment Manikin's (SAM; Bradley & Lang, 1994; Appendix 1) were administered to participants; one measuring levels of Arousal and the other Valence following the viewing of the stimuli. These measurements have been previously used for assessment of images in the International Affective Picture System (IAPS: Lang & Bradely, 2008) and the Concordia Sexual Imagery Database (Shilhan et al., 2012). Both the Arousal (ranging from 'un-aroused' to 'very aroused') and Valence (ranging from 'unpleasant' to 'pleasant') Likert scales were 9 point rating scales.

Procedure

Prior to participation, participants were explained both the purpose and procedure of the experiment. They were made aware of the fact that they would be watching a series of 5-6 video segments, lasting between 1-4 minutes in length each, all containing sexually explicit material (i.e.: fellatio, cunnilingus, heterosexual intercourse, homosexual intercourse, and naked activities). They were also informed that they had to look at the video segments in the same way that they would if they were watching them at home, and would be asked to rate their levels of Arousal and Valence following each video segment. The experimenter then defined these terms. Participants were encouraged to ask questions before and after the experiment. They were told that if at any time they felt uncomfortable they should gesture to or verbally tell the experimenter, and that they may discontinue from participation at any time should they feel uncomfortable with any aspect of the procedure with no damage to their credits. Following this and after providing consent, they filled out the Concordia University Sexual History Questionnaire.

Participants were set up in an isolated room in front of the computer screen, where the PowerPoint presentation containing the video segments was already set up. They were told that each video segment would last between 1-4 minutes in length, and that each video had to be watched in its' totality. Depending on which condition they were in, participants viewed 5-6 video segments that fell under one of the categories listed above. Participants wore headphones throughout the video presentations. After watching each video, an un-timed slide would appear asking participants to rate their level of Arousal and Valence using two 9-point scales (Bradley & Lang, 1994). Following the end of their participation, participants were thanked, and awarded their respective participant pool credits.

Results

Data Cleaning

Prior to all analyses, the Between-Subject Variability was removed from the raw data (Loftus & Masson, 1994). The Likert scale data collected for the ratings of each video segment was analysed by use of IBM SPSS Statistics (2015) and JASP (0.8.1.2). As such, *p*-values, Cohen's *d*, and Bayesian factors were calculated on the following data. The Bayesian factor (BF_{10}) provides a likelihood ratio for the research hypothesis over the null hypothesis (Wetzels et al., 2011). Thus, unlike traditional *p*-values, Bayesian factors provides information regarding if the null hypothesis (H_0) is better than the alternate hypothesis (H_1), or vice versa, while still maintaining "prudence" without overestimating the magnitude of the effect ($BF_{10} < 1$, evidence for H_0; $BF_{10} = 1$, no evidence; $BF_{10} = 1\text{-}3$, anecdotal evidence for H_1; $BF_{10} > 3$, evidence for H_1; Wetzels et al., 2011). Because these values are recommendations for interpreting Bayesian factors, we report raw Bayesian factors, thus allowing other researchers to interpret them in the future.

Analyses

As this study was conducted as a precursor to the following study found in Chapter 3, results presented will focus solely on 3 (Heterosexual Intercourse: Video 4; Male – Male Intercourse: Video 6; Nonsexual Naked Activity: Video 4) of the 33 videos segments analysed. For full details of all the descriptive statistics (and subsequent statistical analysis) for both the Arousal and Valence ratings for all videos analysed, please refer to table 2.3. to 2.8. Interestingly, videos that have been used in previous studies (Chivers et al., 2007) did not receive the ratings that were anticipated. Specifically, the video received from the previous study from the Heterosexual Intercourse received the lowest ratings of all video segments for this category for Arousal, $M = 3.59$, $SD = 1.65$, and Valence, $M = 3.77$, $SD = 1.81$. Additionally, those received for the Nonsexual naked activity condition, which were meant to be rated as more neutral compared to the other conditions, were found to have inconsistent ratings. Although both (i.e.: Video 3 and 5) were rated low on Arousal, video 3 was also low on Valence.

Of all the videos rated, the three video clips of interest were chosen with the purpose of obtaining three different categories that could, in the following study (Chapter 3), potentially elicit the most distinct responses with regards to sexual arousal. The categories were as follows: High Arousal/High Valence (most preferred, Heterosexual Intercourse condition), Low Arousal/Neutral Valence (neutral, Nonsexual Naked activity), and Low Arousal/Low Valence (least preferred, Male – Male Intercourse). In addition, between subject variability was removed from all rating data for the purpose of the following analyses (Loftus & Masson, 1994). This was done as between subjective variability typically plays no statistical role when conducting within-subject analyses (Loftus & Masson, 1994). As such, for the High Arousal/High Valence category (i.e.: Heterosexual Intercourse: Video 4), the video segment with highest mean for both the arousal, $M = 5.86$, $SD = 1.18$, $SEM = .25$, and valence, $M = 6.09$, $SD = 2.18$, ratings were found and compared to the video segment with the lowest mean for both the arousal, $M = 3.59$, $SD = 2.28$, and valence, $M = 3.77$, $SD = 2.35$, ratings in the same category, using a non-directional paired samples t-test. This was found to be statistically significant for both arousal, $t(21) = 4.87$, $p < .001$, $d = 1.04$ with decisive evidence for the research hypothesis, $BF_{10} = 333.9$; and valence, $t(21) = 4.09$, $p < .001$, $d = .87$, with very strong evidence for the research hypothesis, $BF_{10} = 62.45$. Please refer to table 2.9., 2.1.0., 2.1.1., and 2.1.2. for full details.

A similar procedure was implemented when looking for the two following categories. For the Low Arousal/Neutral Valence category, the video chosen (i.e.: Nonsexual Naked Activity: Video 4) had both a low arousal rating, $M = 2.96$, $SD = 1.73$, but had the middle most rating for valence, $M = 4.88$, $SD = 2.13$, which represented its' neutrality. It was then compared to the video segment rated lowest in ratings of arousal, $M = 2.16$, $SD = 1.63$, and valence, $M = 2.96$, $SD = 1.71$, in the same category, using a non-directional paired samples t-test. This was found to be statistically significant for both arousal, $t(23) = 3.02$, $p = .006$, $d = .62$ with substantial evidence for the research hypothesis, $BF_{10} = 7.34$, and valence, $t(23)= 4.91$, $p < .001$, $d = 1.00$, with decisive evidence for the research hypothesis, $BF_{10} = 447.6$. Please refer to table 2.1.3., 2.1.4. , 2.1.5., and 2.1.6. for full details

Finally, although the video segment chosen for the Low Arousal/Low Valence category (i.e.: Male – Male Intercourse: Video 6) was not found to have the lowest ratings (videos 1, 2, 4\, and 5 were rated as lower), it was the only one found to be consistent across both scales. Where as other video segments were rated low on arousal and neutral on valence, the video chosen had both a low arousal rating, $M = 3.17$, $SD = 2.06$, and low valence ratings, $M = 3.04$, $SD = 1.61$, $SEM = .21$. As such, it was compared to the lowest rated video segment on arousal, $M = 2.30$, $SD = 1.26$, and the lowest rated video segment on valence, $M = 2.44$, $SD = 1.65$, using a non-directional paired samples t-test. This was found to be not statistically significant for arousal, $t(22) = 1.95$, $p = .06$, $d = .41$, with anecdotal evidence for the research hypothesis ($BF_{10} = 1.09$); but statistically significantly different for valence, $t(22) = 2.18$, $p = .04$, $d = .45$ with anecdotal evidence for the research hypothesis, $BF_{10} = 1.57$. However, based on the moderate effect sizes ($d > .4$), and the low variance in ratings, we decided to proceed to using this video in subsequent experiments. Please refer to table 2.1.7., 2.1.8., 2.1.9 and 2.2.0. for full details.

Discussion

A number of previous studies have used erotic video stimuli to study the sexual arousal response (Chivers et al., 2007; Tsujimura et al., 2009). However, these previous publications used researcher chosen stimuli, without any validation for arousal and valence. In an aim to provide such stimuli, the current study had 33 videos rated across a number of different erotic categories. The results obtained from the current experiment demonstrated that the ratings obtained from the previously used video segments (Chivers et al., 2007) were not as consistent as we would have expected. As seen from the results, the High Arousal/High Valence video segment from this previous study was in fact rated the lowest of all the videos used. This causes some concern as the results obtained from previous studies that have used this video may be confounded by how participants truly perceived this video. Larger effects may have been obtained with a video with higher valence and arousal ratings, and that had been previously validated (Silva, 2011). This also highlights researcher bias in choosing videos, as they choose videos that they themselves find arousing. However, this may not be the case for the general population. This is more concerning for women, as research has shown that women are far more distributed in how they response to sexual stimuli (Shilhan et al., 2012; Farisello et al, 2017). Therefore, the choice of stimuli (either images or videos) is all the more important in order to get the desired response. Results highlight the importance of standardized stimuli, as although the studies utilizing the borrowed video segments did produced significant results, stronger effects may have been observed.

In assessing the video segments of interest for the current study, interesting characteristics about the High Arousal/ High Valence video segment are observed. To begin, the angle at which the video clip is shot is wide and stable, meaning that the camera position stays the same throughout the entire segment. In addition, the couple on screen is positioned in such a way that the female actress is in the foreground, with the male actor behind her. Further, throughout the vaginal intercourse, the woman is being stimulated via the clitoris as well. Finally, this video clip ends with her climax and not her male counterparts'. These characteristics are what I deem to be more female-centric, such that the woman's pleasure is being highlighted over the males'. This then may be why the women of the study rated this video as being the most arousing and likeable.

A limitation of this experiment worth noting is that, although I tried to control for shot type for each video segment chosen, they are not identical. In addition, the actors are not the same across videos. As a result, such as shot type (Loschky, Larson, Magliano, & Smith, 2015), body type (Fromberger, et al., 2012; Mitrovic, Tinio, & Leder, 2016), bodily features (Bovet, Lao, Bartholomée Caldara, & Raymond, 2016), breast size (Dixson, Grimshaw, Linklater, & Dixson, 2011), and attractiveness (Leder, Mitrovic, & Goller, 2016) may cause differences in the ratings obtained. As such, it is strongly suggested to address these issues by conducting further video validation studies that include a wider variety of actors/actresses in terms of ethnicity, weight, level of attractiveness. Additionally, researchers should attempt to consider the type of shot the video was filmed in and further analyse videos based on this feature.

Chapter 3: Identifying Objective Markers of Sexual Arousal: Using Eye Tracking, Pupillometry, and Heart Rate Variability

Identifying Objective Markers of Sexual Arousal: Using Eye Tracking, Pupillometry, and Heart Rate Variability

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Introduction

As discussed in the previous chapter, studies in the field of sexual behaviour will often use images or videos as their primary stimuli to elicit physiological and/or subjective sexual responses. In fact, the use of this form of stimuli is not a novel concept. Research conducted by Wincze, Hoon, and Hoon (1977) exposed women to a variety of erotic videos to study their physiological responses (i.e., vaginal, groin, and breast vasocongestion), and asked the participants to rate their subjective levels of sexual arousal. More recently, research conducted by Huberman and Chivers (2015) utilized an array of erotic videos to study the genital responses of heterosexual men and women, in the aim of linking subjective arousal to physiological arousal. Through the use of these types of stimuli, findings regarding patterns of sexual responses, such as those related to sexual arousal and desire have been emerging in the field of Sex Research (e.g., Tsujimura et al., 2009; Dawson & Chivers, 2016; Dewitte, 2016). However, much of these findings are met with some confusion by researchers, in particular with the sexual responses patterns of heterosexual women. Specifically, heterosexual women have been found to have a lack of concordance between their subjective self-reported sexual response, and the corresponding objective physiological measures of arousal (Chivers, Seto, & Blanchard, 2007). For example, previous researchers have demonstrated that heterosexual women's' genital responses, as measured via vaginal thermography and/or plethysmography, are nonspecific to the type of sexual stimuli they are presented with; however, their subjective responses in contrast are specific to their sexually preferred stimuli (Chivers, Seto, & Blanchard, 2007). This lack of concordance between women's objective and subjective responses to sexual stimuli begs the following question: Are there any objective measures that can overcome this discordance to accurately capture both subjective and objective responses to sexual stimuli?

3.1. Eye Tracking and Sex

Researchers have searched for different objective measures in order to better understand this conundrum. One such is the use of eye tracking methodologies, which has become quite popular in the field of sex research. Eye tracking has recently been used as an additional form of objective measure, to compliment the findings brought about by vaginal thermography and plethysmography (e.g., Dawson & Chivers, 2016). This was done in an attempt to broaden the understanding of the female discordance problem. One such study conducted by Dawson and Chivers (2016) investigated the Information Processing Model (IPM) of sexual response in heterosexual men and women. This model proposes that sexual cues direct attention and initiates sexual responding (Janssen, Everaerd, Spiering, & Janssen, 2000). They hypothesized that visual patterns of attention for preferred and non-preferred stimuli, as measured by the use of eye tracking to explicitly measure stimuli which individuals would look at first, would differ based on the gender of the participant. Gender differences were indeed observed with regards to viewing patterns, such that heterosexual males showed an initial and controlled attentional bias to their preferred sexual stimuli (i.e., female targets: Dawson & Chivers, 2016). Conversely, heterosexual women's initial attention was gender non-specific, such that they would equally orient toward male or female stimuli. This however did not continue to their controlled attention, as women showed a gender-specific pattern of controlled attention for their preferred stimuli after the first initial eye movement (Dawson & Chivers, 2016). The researcher's surmised that a woman's initial visual attention patterns might be linked to their nonspecific genital responses (Dawson & Chivers, 2016).

Further research utilizing eye tracking dove deeper into the study of early processing patterns of sexual response through the use of a cognitive task (Farisello et al., 2017). Prior to completing the cognitive task, participants were primed with either a 20-minute pornographic video of their choice, or a neutral video for those in the control group (Farisello et al., 2017). The cognitive component consisted of a "mixed saccade" task, where participants were shown a centrally placed image ranging from naked males and females, couples, and people in neutral stances and clothing (Farisello et al., 2017). Rectangular targets would appear at the center of these images that either turned red or green, and black rectangular targets would appear at the left or right of the image simultaneously (Farisello et al., 2017). Green targets were an indication for participants to do a pro-saccade toward a peripherally placed target, and red central targets indicated the participant to engage in an anti-saccade away from said target (Farisello et al., 2017). When analysing the subjective results, as determined by use of the Sexual Arousal and Desire Inventory (SADI; Toledano & Pfaus, 2006), an unexpected subgroup of pornography primed women that did not feel aroused following the viewing of the pornographic video was revealed (Farisello et al., 2017). Results demonstrated that pornography primed and subjectively aroused women had the longest latency periods over all image categories for both anti- and pro-saccades (Farisello et al., 2017). Women that were primed with the neutral video had shorter latency periods over all image categories for both anti- and pro-saccades; however not as short as the subjectively un-aroused pornography primed group, who had the shortest latency periods of all (Farisello et al., 2017). Men also showed no difference in performance based on priming, but did show a difference in performance based on image type; pro-saccades were most accurate for their non-preferred stimuli (i.e. images of males and low valence), and anti-saccades least accurate when viewing their preferred stimuli (i.e. images of females: Farisello, 2017). As such, it would appear as though the women's arousal state affects their response patterns, however not the specificity of these responses, unlike with men where the opposite pattern was observed (Farisello et al., 2017).

Collectively, these studies demonstrate clear gender differences in eye movement patterns while viewing erotic stimuli. Specifically, at the early processing stage, it would appear that women exhibit a lack of specificity in their visual attention toward presented stimuli (Dawson & Chivers, 2016; Farisello et al*.,* 2017). In addition, evidence suggests women's arousal states have an effect on eye movement patterns at the early processing stage (Farisello et al*.,* 2017). Conversely, when reaching the later processing stages, women shift from non-specific to specific visual attention, as their eye movement patterns demonstrate a bias toward their preferred stimuli (Dawson & Chivers, 2016). In contrast, men overall demonstrate specificity in their visual attention towards their preferred stimuli in both early and later processing (Dawson & Chivers, 2016; Farisello et al*.,* 2017).

3.2. Heart Rate Variability: A Tell-Tale heart

Moving away from the eyes and to the heart, a new wave of researchers have become interested in measuring the impact of arousal on cardiac rhythm has emerged with a new outlook on what the heart can tell us about our feelings. Previous researchers that have studied the involvement of heart rate responses in an attempt to further understand patterns of sexual response have studied it from the perspective of its association to the human autonomic nervous system, specifically with regards to the sympathetic nervous system (SNS). The SNS regulates what is commonly known as the "fight-or-flight" response as well as the body's general homeostasis (Pfaus et al., 2014). In addition, the SNS is known to control pupil dilation, increased heart rate and blood pressure, as a response to both good and bad stress (Pfaus et al., 2014). In the case of sexual response patterns associated to a positive sexual encounter, activation of the SNS would be associated to a good stress. As such, an increase heart rate would be recorded in individuals engaging is a positive sexual encounter. Dysregulation of this system can also lead to changes in sexual responses. For example, male premature ejaculation is a common example of a disregulation of this system. One study investigating the workings of this ailment found that during masturbation and visual sexual stimulation, men who experience premature ejaculation had a higher heart rate than those who do not (Rowland, 2010). The researcher explained this finding as an association between increased as well as excessive sympathetic arousal that could contribute to premature ejaculation (Rowland, 2010).

Beyond the simple association between arousal and heart rate in beats per minute, researchers in arousal and cognition have begun to explore what other measures of heart rate, such as Heart Rate Variability (HRV) can tell us about one's state of arousal. Also known as Inter-Beat Intervals (Acharya, Joseph, Kannathal, Lim, & Suri, 2006), HRV is defined as the variability in the time interval between individual heart beats (Acharya et al., 2006), and is known for being the by-product of the interaction between the sympathetic and parasympathetic nervous system. The popularity of this metric is attributed to its association to emotion regulation. Emotion regulation is a key aspect of everyday life, as it shapes our perceptions of what we personally find relevant in our environment and how we respond to them (Thayer, Åhs, Fredrikson, Sollers, & Wager, 2012). As such, much research interested in HRV as a tool to measure emotion has focused on uncovering the correlates that correspond with shifts in HRV. As a response, a meta-analysis conducted by Kim, Cheon, Bai, Lee, and Koo (2018), interested in the relationship between stress and HRV, concluded that most studies reported negative stress was associated with a decrease in parasympathetic activity, resulting in an overall decrease in HRV. A review conducted by Beauchaine and Thayer (2015) further surmised that this decrease in parasympathetic activity was indicative of individuals allocating emotional self-regulatory mechanisms to dealing with the emotional challenge.

With the aim of further understanding the relationship between HRV and emotions, a study conducted by Choi et al., (2017) aimed to simply answer the question: Is HRV an adequate tool to measure human emotions? Using images from the IAPS (Lang, Bradley, & Cutherbert, 2008), the researchers created three conditions containing five images per condition: Happy, Neutral, and Unhappy (Choi et al., 2017). Participants were asked to simply view these images while hooked onto a plethysmograph, and to further rate them for arousal and valence using the SAM technique (Bradley & Lang, 1994), which was used to rate the original IAPS images. The results indicated that the valence ratings for the images from the Unhappy group that were rated as overall more arousing were positively correlated with HRV, such that the lower the valence ratings, the lower the HRV. Through these results, the researchers concluded that HRV could be a measure of negative human emotion. However, stimuli with a minimum amount of emotional weight are necessary when using HRV as an indicator of emotional responding (Choi et al., 2017).

In addition to using HRV as a marker of emotion, recent researchers have shown that HRV may be used as a biomarker for individual differences in affective responding (Bos, Jentgens, Beckers, & Kindt, 2013). As such, researchers investigating the role of HRV have come to believe that it is a reflection of autonomic flexibility of an individual, and a biomarker of emotion response (Bos et al., 2013). A meta-analyses focusing on the implication of HRV as a marker of stress and health discussed the relationship between these two constructs, and found that the resting HRV is an indication of how flexible ones regulation of their autonomic activity (Thayer et al., 2012). Further, they found that individuals with high frequency HRV at rest have both better state and trait levels emotion regulation skills when faced with adversity (Thayer et al., 2012).

In line with this branch of research, are there any other noticeable differences with regards to HRV that can be studied with regards to patterns of sexual responses? One study conducted by Bos et al., (2013) utilized HRV in a similar fashion to the studies described in the meta-analyses conducted by Thayer et al., (2012). In this study, the researchers exposed participants to three video conditions that contained 4 videos per condition: Negative (i.e. fear-provoking themes), Neutral (i.e. documentary films), and Positive (i.e. two sports clips, two pornographic clips). The objective measures used in this experiment consisted of an Electromylograph to measure the acoustic startle reflex, skin conductance, and heart rate. The first goal of this study consisted of testing if the responses assessed by the three objective measures elicited by the three different types of video clips would reflect a defensive state. A second goal focused solely on heart rate, where the authors were interested in the relationship between baseline levels of HRV related to affective responding to the video clips. The procedure consisted on gathering baseline levels of skin conductance and heart rate for 5 minutes while listening to relaxing music. Following this, they were asked to view each video segment. During each viewing, a startle probe was introduced at two intervals during the video presentations to elicit the acoustic startle reflex. Following each viewing, participants were asked to rate themselves using the SAM for valence, arousal, and dominance (Bradley & Lang, 1994), as well as the Positive and Negative Affective Schedule (PANAS; Crawford & Henry, 2004) in order to measure affective responding. With regards to the results regarding HRV and their second study goal, the researchers determined that there was an inverse relationship with startle magnitude. As such, those with HF-HRV at baseline were better at differentiating their affective responding to the startle probe between the different video categories. Conversely, those with LF-HRV did not show this differentiation, thus exhibiting affective responding to the startle probe regardless of the video category. Similar results were also found by a study conducted by Ruiz-Padial, Sollers III, Vila, and Thayer (2003), who found that emotion-modulated startle magnitude covaried with HRV.

Respecting the results regarding the erotic videos outlined in the study conducted by Bos et al., (2013), participants subjectively rated them higher on valence, yet rather low on the arousal scale. With regards to heart rate, the researchers divided participants based on frequency of HRV, such that participants were split into two groups; those with HF-HRV at baseline and those with LF-HRV at baseline. They found that those with LF-HRV experienced an increased startle response when watching the erotic videos in comparison to the sports videos. In addition, they found a significant negative correlation between the startle reflex and HF-HRV while watching the erotic videos, further supporting the previous result. As such, these results further support the findings discussed regarding the second study goal.

A few limitations must be addressed with regards to this study. The first lies in the fact that the experimenters did not use previously validated videos. As previously discussed in chapter 2, the use of validated stimuli is crucial to the experimental process, as without proper validation, the response elicited by the stimuli may not be the one they were looking to produce. In addition, with proper validated stimuli, researchers may provoke the strongest response in accordance with the stimuli presented, rather than a lesser response.

3.3. Pupillometry: Attraction-Dilation, Aversion-Constriction Hypothesis

An additional and somewhat mysterious metric that has long been overlooked when studying states of arousal is that of Pupillometry. Defined as the measurement of pupil size and reactivity, pupillary responses will represent what is called “pupillary light reflexes”, where pupil constriction represents a physiological response to reduce the amount of light that falls onto the retina, and pupil dilation a response to increase the amount of light (Mathôt, van der Linden, Grainger, & Vitu, 2013). In addition to the light reflex, changes in pupil size occur due to changes in cognitive load and memory, with the general rule that greater dilation is associated with increased processing in the brain (e.g., Hess & Polt, 1964; Beatty & Kahneman, 1966; Bradshaw, 1968). With regards to memory and decision-making, it has been shown the pupil dilation is associated with the decision making process itself rather than the outcome of said decision (de Gee, Knapen, & Donner, 2014).

Research conducted as early as the 1960's has investigated the relationship between changes in pupil dilation and sexual arousal (Hess & Polt, 1960). The aim of earlier research was to determine if preference to sexual stimuli could be determined by observing changes in pupil circumference (e.g., Peavler & Mclaughlin, 1967; Nunally, Knott, Duchnowski, & Parker, 1967). The general hypothesis of these studies attempted to prove was the "attraction-dilation, aversion-constriction" hypothesis, which surmises that when presented with a sexual stimulus that the participant finds attractive, pupils will dilate (Garrett, Harrison, & Kelly, 1989). Conversely, if presented with a stimulus that causes aversion, the pupils will constrict. This hypothesis has driven research to investigate not only how pupils respond to affective stimuli, but to understand the neurological processes involved in pupillary changes caused by these. Indeed, just as changes in heart rate activity discussed earlier, numerous studies have demonstrated that changes in pupil diameter as a response to viewing affective stimuli is controlled by the Autonomic Nervous System, where pupil dilation in these instances of heightened emotional arousal is associated to an increase in sympathetic activity (Bradely, Miccoli, Escrig, & Lang, 2008). Research in the field has also put into question the "attraction-dilation, aversion-constriction" hypothesis, as many have found an increase in pupil dilation when presented with both pleasant and unpleasant arousing stimuli (Bradely et al., 2008).

However, hope for this hypothesis is not yet lost, as it perhaps only needed a small update. A recent study conducted by Finke, Deuter, Hengesch, and Schächinger (2017) aimed to investigate the course of rapid pupillary responses to sexual stimuli. Here, the experimenters moved from simple "dilation" and "constriction" across all participants to differences in pupillary responses as a function of sex. Participants were presented with a series of neutral (i.e.: everyday scenes/portraits) and sexual images (i.e.: Naked men, naked women, and erotic couples) obtained from the IAPS (Lang et al., 2008) and EmoPicS image databases (Wessa et al., 2010). In addition, all erotic images were matched for normative ratings for valence and arousal. Of the results obtained, the researchers noted that noticeable sex differences emerged in the later stages of image processing. Specifically, late pupillary changes in female participants did not significantly differentiate for same- and opposite-sex images. Men, on the other hand, experienced late pupil dilation responses to opposite-sex images. These results fall in line with previous research (e.g.: Chivers et al., 2004; Chivers et al., 2015), further supporting research demonstrating the female concordance issue.

3.4. Experiment Proposal

The purpose of the current study is to identify objective markers of sexual arousal using three proposed physiological measures: Eye Tracking, Heart Rate Variability, and Pupillometry. In addition to these, a series of subjective measures (i.e.: SADI; Toledano & Pfaus, 2006; SAM; Bradley & Lang, 1994) will be used alongside these previously outlined objective measures in order to ascertain a relationship between subjective and objective measures of arousal. The chosen stimuli for this experiment consist of three short video segments that were validated in the previous study, each varying in its arousal and valence ratings: (1) High Arousal/High Valence, (2) Low Arousal/Neutral Valence, (3) Low Arousal/Low Valence.

Several hypotheses are proposed for the following study. Beginning with the subjective data, it is first hypothesized that valence and arousal ratings for the video segments will be the same as those collected in the first experiment. It is also hypothesized that the Low Arousal/Low Valence video segment will receive the most negative ratings as measured by the SADI (Toledano & Pfaus, 2009). In addition, it is hypothesized that the High Arousal/High Valence video segment will receive higher Evaluative, Physiological, and Motivational ratings as measured by the SADI (Toledano & Pfaus, 2009), compared to the other video segments.

With regards to the Eye Tracking Data, it is hypothesized that the Low Arousal/Low Valence video segment will elicit the most eye movement variability across all three video types. Moving to the Heart Rate measure, it is hypothesized that the Low Arousal/Neutral Valence and will cause a decrease in HRV compared to the two other video segments. In addition, it is hypothesized that there will be significant differences in HRV between the individuals that have LF-HRV at baseline and HF-HRV at baseline. Finally, with regards to the pupillometry, it is hypothesized that the High Arousal/High Valence video segment will cause the highest increase in pupil dilation overall, followed by the Low Arousal/Low Valence video segment and finally the Low Arousal/Neutral Valence video clip.

In combining both objective and subjective data, it is first hypothesized that Valence and Arousal ratings will be correlated with HRV. Specifically, it is hypothesized that higher subjective ratings on both of these measures will be correlated with a decrease in HRV for the High Arousal/High Valence segment. Previous research has demonstrated that increase affective states are associated with a decrease in HRV (Rottenberg & Thayer, 2007). Although this research has only demonstrated this with regards to negative affect (Rottenberg & Thayer, 2007; Kim et al., 2018), we hypothesize that a similar effect may be observed for positive arousal.

Further, it is hypothesized that EMV will be correlated with Valence and Arousal Ratings. Previous studies have shown that the more "interested" a participant is in the stimuli presented, the less EMV they exhibit (Henderson & Hayes, 2017). As the High Arousal/High Valence video segment should elicit stronger feelings of interest due to its higher valence and arousal ratings, we hypothesize that this video will have the least EMV. All other statistical analyses conducted were done in an exploratory fashion. As such, no further hypotheses were put forward.

Method

The research protocol was approved by the human research ethics board at Concordia University, in accordance with the Canadian Tri-Council policy statement of ethical conduct for research involving humans.

Participants

Participants were recruited through the Concordia University Psychology Participant Pool System. All of the participants gave informed consent (Appendix C), and received a participation credit for the Psychology Participant Pool. Participants we chose to consider for this study consisted of females, $n = 33$, between the ages of 18 – 46 years old, $M = 22.33$, $SD = 5.17$, and men, $n = 6$, between the ages of 20 – 37, $M = 25.33$, $SD = 6.80$. Via the use of the Kinsey Scale (Kinsey, Pomeroy, & Martin, 1948) to determine sexual orientation, the dominant sexual orientation of this sample was found to be '*Exclusively Heterosexual*', $n = 29$, 72.5%, followed by '*Predominantly Heterosexual, only Incidentally Homosexual', n* = 9, 22.5%. Specifically, 64% of the sample of women was found to be '*Exclusively Heterosexual', n* = 29*,* followed by 29% of them identifying as '*Predominantly Heterosexual, only Incidentally Homosexual', n* = 10. For the male sample, 83% identified as '*Exclusively Heterosexual', n* = 5. All participants rating themselves above a "2" on the Kinsey Scale (i.e.: *Predominantly heterosexual, but more than incidentally homosexual)* were excluded from the participant base, with only one participant who did not report their sexual orientation. For full descriptive statistics regarding age, sex, and sexual orientation please refer to table 3.0.

Materials

Heart Rate Measure: To measure heart rate, heart rate amplitude, and inter-beat intervals, we used a photoplethysmogram (HRM-2511E sensor, Kyoto Electronic Co., China) connected to an Arduino Uno processing board (https://www.arduino.cc) running a custom code (see appendix). Sample rate of the photoplethysmogram by the Arduino board was 200Hz. The

Arduino board was connected to the laptop via USB port, with sampled data being imported into MATLAB using the Arduino toolbox extensions and a custom program. To obtain a stable and accurate heart-rate measure, researchers recommend that heart rate be measured for a 3-minute period. Because participants can vary greatly in their baseline heart rate and heart-rate variability, baseline measure under no stimulation was collected from all participants before the presentation of the visual stimuli.

Eye Tracker. Stimuli were presented and data collected using a Dell Quad-Core PC running Microsoft Windows 7. Participants viewed stimuli on a linearized video monitor (View sonic G225fb 21" CRT, 1024 x 768 pixel resolution, 100-Hz refresh rate). A chin rest was used to stabilize head position at a distance of 70 cm from the screen. Eye position was acquired non-invasively using a video-based eye movement monitor (Eyelink 1000/2K, SR Research, Ottawa, Ontario). The Eyelink system recorded binocular eye position with a sampling resolution of 1000 Hz, so that the eye position is monitored every 1ms.

Measures

Demographics Questionnaire. The Concordia University Sexual History Questionnaire (Appendix 1) was administered to all participants prior to beginning the study. This questionnaire has an array of questions with regards to participant's sexual history, intercourse, intimacy, arousal, and the Kinsey Heterosexual-Homosexual Rating Scale (Kinsey, Pomeroy, & Martin, 1948). The responses to most questions were given via multiple response options.

Sexual Arousal and Desire Inventory (SADI). The SADI questions were administered to evaluate the subjective experience of sexual arousal and desire (Toledano & Pfaus, 2006; Appendix 1) at the start of the experiment for a baseline measure, as well as after watching the movie. It consists of 54 item descriptors, and has four dimensions: cognitive-emotional, motivational, physiological, and negative control (Cronbach's alpha is .90). Individuals were presented with a list of descriptive words and as to rate each word on a Likert type scale based on how it reflects their current state of arousal (1 = "does not describe it at all" and 5 = "describes it perfectly").

Self-Assessment Manikin (SAM). For the purpose of the study**,** two Self-Assessment Manikin's (SAM; Bradley & Lang, 1994; Appendix 1) were administered to participants; one measuring levels of Arousal and the other Valence following the viewing of the stimuli. This has been used previously for assessment of images in the International Affective Picture System (IAPS) and the Concordia Sexual Imagery Database. Both the Arousal (ranging from 'unaroused' to 'very aroused') and Valence (ranging from 'unpleasant' to 'pleasant') likert scales were 9pt-rating scales.

Stimuli. The current study utilized three video segments that had been rated in the previous study outlined in Chapter 2. As such, the chosen video clips were the High Arousal/High Valence (most preferred, heterosexual intercourse condition), Low Arousal/Neutral Valence (neutral, naked activity condition), and Low Arousal/Low Valence (least preferred, homosexual activity condition) video clips.

Procedure

The experiment took place at the Concordia University Vision Lab. Prior to participation, participants were explained both the purpose and procedure of the experiment. They were informed that, as a three-part study, they would have to return for two sessions following the initial one. They were also told that during each session, they would be asked to view one sexually explicit video segment lasting between 1-4 minutes in length each, while hooked up to an eye tracker (ET) and a Heart Rate Monitor (HRM). Additionally, the video segment would change with every segment. Participants were also encouraged to ask questions before and after the experiment. They were told that if at any time they felt uncomfortable they should gesture to or verbally tell the experimenter, and that they may discontinue from participation at any time should they feel uncomfortable with any aspect of the procedure. Following this, they were asked to sign a consent form, and then fill out the Concordia University Sexual History Questionnaire, as well as the baseline SADI. Following this, the experimenters proceeded to setting up the Heart Rate portion of the experiment. The HRM was placed on the index finger of each participant and a three-minute baseline for heart rate was then taken prior to watching each video segment.

This began the eye-tracking portion of the experiment, where participants sat in front of the eye-tracker monitor and the height of the chinrest and chair were adjusted to get the intended camera image. Eye-movement research requires information on the subject's point of gaze on a display of visual information. To compute this, researchers need to determine the correspondence between pupil position in the camera image and gaze position on the subject display. We do this by performing a system calibration, displaying several targets for the subject to fixate. The pupil - CR position for each target is recorded, and the set of target and pupil - CR positions is used to compute gaze positions during recording. A nine-point calibration type ("HV9") is used. The participant must follow a fixation point that moves in random spots on the monitor (9 times). The positioning is the default values for a 9pt calibration for the EyeLink 1000. This is done once followed by a validation. By running a validation immediately after each calibration, the accuracy of the system in predicting gaze position from pupil position is scored. If performance is poor (average below .5, max error 1 degree), the calibration should be immediately repeated. If performance is adequate, then the study may begin.

Once this step was completed, experimenters initiated the video segment. The volume was set at a moderate level so that participants were exposed to the sound of the video clips, however not high enough such that anyone outside the testing room could hear the video clips. Participants were left alone in the testing room during the viewing in order to diminish any experimenter influence. Once the viewing was completed, the experimenter re-entered the testing room and removed the HRM from the participants. This then permitted them to rate their levels of Arousal and Valence using two 9 point scales (Bradley & Lang, 1994). As well, participants then completed the SADI for the second time. This process was then repeated for the two following participations (with the exception of filling out the consent form, the Concordia University Sexual History Questionnaire, and the baseline SADI). Participants were however asked to fill out the Likert scales and the SADI following the viewing of each video segment. With the completion of the third participation, participants were thanked awarded their promised credits.

Data Analyses

Analyses of Heart Rate. Heart data were processed separately for baseline resting-state and post-video conditions using Kubios HRV 3.1 (Tarvainen, Niskanen. Lipponen, Ranta-aho, & Karjalainen, 2014) for the time-domain analysis. Artifacts and linear trends were removed using the built-in filtering and detrending functions and, subsequently, the signals were manually examined for quality assurance purpose. The default HRV analysis settings included: sampling frequency (1000 Hz), detrending method (smoothing priors with the smoothing parameter 500), and an analysis window (30 s window with 50% overlap). For HRV analysis, time-domain parameters included the average inter-beat interval (mean RR), standard deviation of RR (SDNN), root mean square of successive RR differences (rMSSD),

Analyses of Eye Movements. One technique to calculate eye movement variability across a spatiotemporal stimulus in such a quantitative manner is through the within-isoline area (Whittaker et al., 1988; Castet & Crossland, 2012). This method was chosen as it assumes a non-parametric distribution of eye movements, and does not make any assumptions on the underlying distribution of the data points (Castet & Crossland, 2011). To calculate the within-isoline area, for each group of participants (males-sequence, males-random, female-sequence, female-random) we superimpose each participants eye gaze position (in x/y pixel coordinates) on each frame of the video. We then estimated the probability density function corresponding to the eye position samples by using kernel density estimation. In doing so, we create a probability density 'heat' map over each video frame. Further, this technique allowed us to uncover more than one point of interest in one frame should they be present. We then chose a level of density corresponding to 68% of the distribution of eye movements, and calculated the area enclosed by this 68% isoline using the *polyarea* function in MATLAB (ver. 2014b, The Mathworks, MA). This function gives us a metric value (in pixels^2) of the area contained within the isoline. The larger the value of the area, the more variation there is in the eye positions (i.e., fixation locations are dispersed across larger area). The closer to zero that the within-isoline area get, then the less variation there is in the fixation positions (i.e., fixations focused on a single item of interest). Choosing such an analysis helps to remove outliers caused by random eye movements, or participants that may view the video in a different manner, ensuring that such outliers do not affect the overall results.

Pupillometry Analyses. Raw sample pupil size measures were extracted from the results files. For missing data samples, we have favoured a method of regressing each eye onto the other, applying a low-pass filter (4 Hz) to remove sample noise jittering. Next, eye blinks and missing data were identified, and missing data replaced using cubic-spline interpolation. This method is described in detail elsewhere (Mathôt, et al., 2013), but basically works as follows: Four points (A, B, C, and D) are placed around the on- and offset of the blink. Point B is placed slightly before the onset of the blink; point C is placed slightly after the onset of the blink. Point A is then placed before point B; point D is placed after point C. Points are equally spaced, such that the distances between A and B, B and C, etc. are constant. Finally, a smooth line is drawn through all four points, replacing the missing and distorted data between B and C.

As participants differed in their baseline pupil diameter, we subtracted a pre-trial baseline value (averaged over 100ms before start of the trial while participants looked at the fixation cross), such that data is transformed into relative changes in pupil diameter, which standardizes participants at (or near) zero at the onset of trials (Jainta & Baccino, 2010) This reduces variability from absolute values, which is both statistically useful and practically relevant for assessing *changes* in pupil size as a function of independent variables.

Because the participants were free to move their eyes around while watching the videos, this introduces the possibility of position artefacts in the pupillometry measures, termed pupil-foreshortening error (PFE). Imagine that a participant looks directly at the lens of a video-based eye tracker. The pupil is then recorded as a near-perfect circle. Now imagine that the participant makes an eye movement to the right, thus causing the eye ball to rotate, changing the angle from which the eye tracker records the pupil, and causing the horizontal diameter of the pupil (as recorded) to decrease. In other words, pupil size as recorded by the eye tracker decreases, even though pupil size really did not change. Currently, eye trackers cannot distinguish between artifactual changes in pupil size due to eye movements, and real changes in pupil size. Of critical importance to researchers, these artifactual changes in pupil size can be larger than pupil size changes due to cognitive manipulation. To solve this issue, we used a model-driven correction that uses knowledge about the relative position of the camera, eyes and the eye tracker (Hayes & Petrov, 2016). Using artificial pupils, we systemically mapped and correct the PFE across the full display. Consequently, all subsequent pupil data have any PFE removed.

Results

The following data was analysed by use of IBM SPSS Statistics (2015) JASP (0.8.1.2) and Matlab (2106a) on the Likert scale data collected for the ratings of each video segment, as well as the Heart Rate measure analyses, Eye Tracking analyses, and EEG analyses. As such, both *p*-values and Bayes factors were run on most of the following data. The Bayesian factor (BF_{10}) provides a likelihood ratio for the research hypothesis over the null hypothesis. Thus, unlike traditional p-values, Bayesian factors provides information regarding if the null hypothesis (H_0) is better than the alternate hypothesis (H_1), or vice versa, while still maintaining "prudence" without overestimating the magnitude of the effect ($BF_{10} < 1$, evidence for H_0; $BF_{10} = 1$, no evidence; $BF_{10} = 1\text{-}3$, anecdotal evidence for H_1; $BF_{10} > 3$, evidence for H_1, Wetzels et al., 2011). Consequently, BF allow us to interpret a traditional null result as either having insufficient evidence to support null or research hypothesis, or that the null hypothesis is true. Because these values are recommendations for interpreting Bayes Factors, which should only be used as a guide until a meta-analytical analysis of Bayes Factors is conducted within a scientific field (Wetzels et al. 2011), we report raw Bayes Factors, thus allowing other researchers to interpret them in the future.

SADI

Data Cleaning

Prior to analyses, all SADI ratings were reviewed for missing data. All missing cases were replaced with the mean of the condition where there was less than 5% of the data was missing (Kline, 2009). For the High Arousal/High Valence video segment for women, two participants were removed for not completing the trial (i.e. participant 9 and 14), and one for providing an incomplete response to the measure (i.e. participant 21). For the Low Arousal/Neutral Valence video segment for women, three participants were removed for not completing the trial (i.e.: participant 14, 21, and 42). Finally, for the Low Arousal/Low Valence video segment for women, two participants were removed for not completing the trial (i.e.: participant 14 and 21). For the men's data, only one participant was removed from the Low Arousal/Neutral Valence video segment (i.e. participant 37) for not completing the trial, where no other trials were contained missing data.

SADI Analyses

Means, standard deviations and sample sizes were calculated for each of the SADI components for baseline as well as for each trial. For further information regarding these statistics please refer to tables 3.1., 3.2., 3.3., and 3.4. In addition, means, standard deviations and sample sizes were calculated for each word of all SADI components for baseline as well as for each trial. Please refer to table 3.5. for further information.

Repeated measures ANOVA's were conducted to compare each component to one-another across baseline and each trial. Beginning with the Evaluative component of the SADI, Mauchly's test of Sphericity was performed to assess possible violation of the Sphericity assumption; this was significant, $W = .76$, $x^2(5) = 274.69$, $p < .001$. As a result, the Greenhouse-Geisser epsilon value of .86 was used to correct the degrees of freedom used to evaluate the significance of the F ratio. In addition, the overall model was found to be statistically significant, $F(2.58, 2579.75) = 285.9$, $p < .001$, $\eta^2 = .22$, with decisive evidence for the research hypothesis, $BF_{10} = 2.593e+165$. Pairwise comparisons using a Bonferroni correction were also conducted, and found that all comparisons were statistically significant for the Evaluative component. For this component overall, it was found that the Baseline SADI had the highest ratings, followed by the High Arousal/High Valence video segment, the Low Arousal/Low Valence video clip, and finally the Low Arousal/Neutral Valence video clip. Please refer to table 3.6., 3.7., and 3.8. all for ANOVA and pairwise comparison details.

Moving to the Negative component for women, Mauchly's test of Sphericity was performed to assess possible violation of the Sphericity assumption; this was significant, W = .95, $x^2(5) = 35.51$, $p < .001$. As a result, the Greenhouse-Geisser epsilon value of .96 was used to correct the degrees of freedom used to evaluate the significance of the F ratio. The overall model was also found to be significant, $F(2.90, 1817.93) = 10.08$, $p < .001$, $\eta^2 = .02$, with decisive evidence for the research hypothesis, $BF_{10} = 2672.39$. Pairwise comparisons using a Bonferroni correction were also conducted, and found that that all comparisons were not statistically significant, with the exception of the comparison between the High Arousal/High Valence and the Low Arousal/Low Valence video segments, $t = -4.63$, $p < .001$, $d = .25$, and between the Low Arousal/Neutral Valence and Low Arousal/Low Valence video segments, $t = -4.85$, $p < .001$, d = .25. For this component overall, the Low Arousal/Low Valence video segment was rated the highest is comparison to the other video segments and baseline. Please refer to table 3.9., 3.1.0., and 3.1.1. for all ANOVA and pairwise comparison details.

Continuing with the Physiological component, and the Mauchly's test of Sphericity was performed to assess possible violation of the Sphericity assumption; this was significant, W = .65, $x^2(5) = 284.21$, $p < .001$. As a result, the Greenhouse-Geisser epsilon value of .75 was used to correct the degrees of freedom used to evaluate the significance of the F ratio. The overall model was also found to be significant, $F(2.27, 1382.34) = 157.43$, $p < .001$, $\eta^2 = .16$, with decisive evidence for the research hypothesis , $BF_{10} = 1.663e +94$. Pairwise comparisons using a Bonferroni correction were also conducted, and found that all comparisons were statistically significant for the Physiological component, with the single exception of the comparison between the Baseline and the High Arousal/High Valence video segment which was found to be non-significant, $M_{diff} = .03$, $SE = .07$, $t = .47$, $p = 1.00$, $d = .02$. For the Physiological component overall, both the Baseline and the High Arousal/High Valence were rated the highest. Please refer to table 3.1.2., 3.1.3. and 3.1.4. for all ANOVA and pairwise comparison details.

Finishing with the Motivational component of the SADI, Mauchly's test of Sphericity was performed to assess possible violation of the Sphericity assumption; this was significant, W = .75, $x^2(5) = 100.80$, $p < .001$. As a result, the Greenhouse-Geisser epsilon value of .86 was used to correct the degrees of freedom used to evaluate the significance of the F ratio. The overall model was also found to be significant, $F(2.57, 925.69) = 92.63$, $p < .001$, $\eta^2 = .21$, with decisive evidence for the research hypothesis , $BF_{10} = 2.490e +52$. Pairwise comparisons using a Bonferroni correction were also conducted, and found that all comparisons were statistically significant, with the exception of the comparison between the Low Arousal/Neutral Valence and Low Arousal/Low Valence video segment, M_{diff} = -.21, *SE* = .09, *t* = -2.15, *p* = .19, *d* = .21. For the Motivational component overall, both the Baseline and the High Arousal/High Valence video segment were rated the highest. Please refer tables 3.1.5., 3.1.6., and 3.1.7. for all ANOVA and pairwise comparison details.

Responses on the SADI for men and women were compared using Independent samples t-test and BFs. For the Evaluative component, a significant difference was observed, where men, *M* = 1.08, *SD* = 1.08, had higher ratings for the Low Arousal/Low Valence video segment in comparison to women, *M* = .47, *SD* = .92, *t*(970) = -6.95, *p* < .001, *d* = -.64, with decisive evidence for the alternative hypothesis, BF_{10} = 1.008e +9. No significant differences were found for the other two video segments for this component. See table 3.1.8. and 3.1.9. for full details.

For the Negative component, a first significant difference in baseline ratings between men, *M* = .73, *SD* = 1.11, and women, *M* = .45, *SD* = .94, *t*(678) = 2.67, *p* = .008, *d* = .28, was found, with anecdotal evidence for the alternate hypothesis, BF_{10} = 3.63, where men had higher ratings than women. In addition, a second significant difference between men, *M* = .2, *SD* = .61, and women, *M* = .47, *SD* = 1.04, was found where women had higher ratings than men for the Low Arousal/Neutral Valence video, *t*(610) = -2.36, *p* = .019, *d* = .08, with anecdotal evidence for the alternate hypothesis, BF_{10} = 1.824. Finally, there was a last significant difference between men, *M* = .63, *SD* = 1.02, and women, *M* = .40, *SD* = .90, for the High Arousal/High Valence video segment, where men had higher ratings than women. See table 3.2.0.. and 3.2.1. for full details.

For the Physiological component, all independent samples t-tests were significant, with the exception of the baseline ratings, where men, *M* = 1.53, *SD* = 1.53, were not significantly different than women, *M* = 1.88, *SD* = 1.73, in their ratings, *t*(678) = -1.94, *p* = .052, *d* = -.21, with decisive evidence for the null hypothesis, BF_{10} = .73 . See table 3.2.2. and 3.2.3. for full details.

Finally, for the motivational component, a single significant difference between male, *M* = .74, *SD* = .78, and female, *M* = .37, *SD* = .81, ratings was found for the Low Arousal/Neutral Valence video segment, *t*(358) = -3.06, *p* = .002, *d* = -.47, with decisive evidence for the alternate hypothesis, BF_{10} = 12.48, where male ratings were higher than females. See table 3.2.4.. and 3.2.5. for full details.

SAM – Valence and Arousal

Study 1 and 2 Comparison

Valence and Arousal ratings were collected following the viewing of each video segment in order to ensure that the ratings collected from the experiment conducted in Chapter 2 were similar. However, given that participants from the first experiment outlined in Chapter 2 consisted solely of women, the comparison data from this experiment will done using the data collected from the female participants alone. Ratings collected from the men in this experiment will be considered as pilot data. In addition, all participants who did not complete the trial were removed from the analyses (i.e.: participant 13, 21, and 31) and all missing cases were replaced with the mean of the condition (i.e.: Participant 9 for the High Arousal/High Valence video segment, for both Valence and Arousal, and Participant 42, for the Low Arousal/Neutral Valence video segment, for both Valence and Arousal), where there was less than 5% of the data was missing. Finally, within subject variability was removed from all rating data for the purpose of the following analyses

As such, independent samples t-tests were conducted to test for possible differences. Ratings for the High Arousal/High Valence video segment from the first experiment were not found to be statistically significantly different from those of the current experiment for both Arousal, $t(55) = -1.40$, $p = .17$, $d = -.38$, with inconclusive evidence for the alternate hypothesis, $BF_{10} = .61$, and Valence, $t(55) = -.72$, $p = .47$, $d = -.19$, with inconclusive evidence for the alternate hypothesis, $BF_{10} = .34$. Conversely, ratings for the Low Arousal/Neutral Valence video segment from the first experiment were found to be statistically significantly different from the ratings of the current experiment for Arousal, $t(57)= -2.85$, $p = .006$, $d = -.75$ with decisive moderate evidence for the research hypothesis, $BF_{10} = 7.095$, and but not so for the Valence ratings, $t(57)= -1.29$, $p = .20$, $d = -.34$, with inconclusive evidence for the alternate hypothesis, $BF_{10} = .54$. Mean differences indicate that participants from the current experiment rated themselves higher for this video segment in terms of Arousal. Finally, ratings for the Low Arousal/Low Valence video segment from the first experiment were not found to be statistically significantly different from the ratings of the current experiment for Arousal, $t(55) = -.83$, $p = .41$, $d = -.22$, with decisive evidence for the null hypothesis, $BF_{10} = .36$, but not so for the Valence ratings, $t(55) = 2.07$, $p = .043$, $d = .56$, with anecdotal evidence for the alterative hypothesis, $BF_{10} = 1.56$, where the valence ratings in the second study were higher than those in the first study. Please refer to tables 3.2.6., 3.2.7., 3.2.8., and 3.2.9. for full details of these analyses.

Study 2 Analyses - Overall

All participants were asked to rate their levels of Valence and Arousal using the valence and arousal SAM scales (Lang, 1980) following the presentation of each video segment. All participants who did not complete the trial were removed from the analyses (i.e.: participant 13, 21, and 31) and all missing cases were replaced with the mean of the condition (i.e.: Participant 9 for the High Arousal/High Valence video segment, for both Valence and Arousal, Participant 37 for the Low Arousal/Neutral Valence video clip for both Valence and Arousal, and Participant 42, for the Low Arousal/Neutral Valence video segment, for both Valence and Arousal), where there was less than 5% of the data was missing (Kline, 2009, p.241).

Two repeated measures ANOVA's were conducted to determine if there were any significant differences between ratings for each video segment overall. Beginning with the Arousal ratings, Mauchly's test of Sphericity was performed to assess possible violation of the Sphericity assumption; this was not significant. As such, no corrections were made. The overall model was found to be significant, $F(2, 76) = 46.02$, $p < .001$, $\eta^2 = .55$, with decisive evidence for the research hypothesis, $BF_{10} = 9.225e+11$. Pairwise comparisons using the Bonferroni correction were conducted and found a significant difference between the High Arousal/High Valence and the Low Arousal/Low Valence video segments, as well as between the High Arousal/High Valence and Low Arousal/Neutral Valence video segments. The mean ratings for the High Arousal/High Valence video clip are higher than those of the Low Arousal/Low Valence and Low Arousal/Neutral Valence video segment. Please refer to table 3.3.0., 3.3.1., and 3.3.2. for further information. With regards to the Valence ratings, Mauchly's test of Sphericity was performed to assess possible violation of the Sphericity assumption; this was not significant. As such, no corrections were made. The overall model was found to be significant, $F(2, 76) = 12.42$, $p < .001$, $\eta^2 = .25$, with decisive evidence for the research hypothesis, $BF_{10} = 1536.26$. Pairwise comparisons using the Bonferroni correction were conducted and found a significant difference between the High Arousal/High Valence and the Low Arousal/Low Valence video segments, as well as between the High Arousal/High Valence and Low Arousal/Neutral Valence video segments. The mean ratings for the High Arousal/High Valence video clip are higher than those of the Low Arousal/Low Valence and Low Arousal/Neutral Valence video segment. Please refer to table 3.3.3., 3.3.4. and 3.3.5. for further information.

Study 2 Analyses – By Participant Sex

In addition to the overall analyses, the following repeated measures ANOVA's were conducted in order to analyse the ratings by participant sex. All participants who did not complete the trial were removed from the analyses (i.e.: participant 13, 21, and 31) and all missing cases were replaced with the mean of the condition (i.e.: Participant 9 for the High Arousal/High Valence video segment, for both Valence and Arousal, and Participant 42, for the Low Arousal/Neutral Valence video segment, for both Valence and Arousal), where there was less than 5% of the data was missing (Kline, 2009).

Beginning with the Arousal ratings of women, Mauchly's test of Sphericity was performed to assess possible violation of the Sphericity assumption; this was not significant. As such, no corrections were made. The overall model was found to be significant, $F(2, 64) = 41.48$, $p < .001$, $\eta^2 = .56$, with decisive evidence for the research hypothesis, $BF_{10} = 2.873e+10$. Pairwise comparisons were conducted and found a significant difference between the ratings of the High Arousal/High Valence and the Low Arousal/Low Valence video segment, where the mean ratings of the former were higher than the latter. In addition, another significant difference was found between the High Arousal/High Valence and the Low Arousal/Neutral Valence video segment, where again the mean ratings of the former were higher than the ratings of the latter. Moving to the Valence ratings, Mauchly's test of Sphericity was performed to assess possible violation of the Sphericity assumption; this was not significant. As such, no corrections were made. The overall model was found to be significant, $F(2, 64) = 11.21$, $p < .001$, $\eta^2 = .26$, with decisive evidence for the research hypothesis, $BF_{10} = 532.96$. Pairwise comparisons demonstrated a significant difference between the High Arousal/High Valence and the Low Arousal/Low Valence video clip, where the mean ratings of the Low Arousal/Low Valence video clip were higher. In addition, the mean ratings for the Low Arousal/Low Valence video segment were significantly lower than the Low Arousal/Neutral Valence video clip. For further information for both the Arousal and Valence ratings for women, please refer to table 3.3.6., 3.3.7., 3.3.8., 3.3.9., 3.4.0., and 3.4.1.

Continuing with the Arousal ratings of men, Mauchly's test of Sphericity was performed to assess possible violation of the Sphericity assumption; this was not significant. As such, no corrections were made. The overall model was found to be significant, $F(2, 10) = 13.55$, $p < .001$, $\eta^2 = .83$, with decisive evidence for the research hypothesis, $BF_{10} = 263.72$. Pairwise comparisons demonstrated that the mean ratings of the High Arousal/High Valence video segment are significantly higher than those of the Low Arousal/Low Valence and the Low

Arousal/Neutral Valence video segments. Further, mean ratings of the Low Arousal/Low Valence video segment were significantly lower than those of the Low Arousal/Neutral Valence video segment. For the Valence ratings, Mauchly's test of Sphericity was performed to assess possible violation of the Sphericity assumption; this was not significant. As such, no corrections were made. The overall model was found to be significant, $F(2, 10) = 6.19$, $p = .02$, $\eta^2 = .55$, with substantial evidence for the research hypothesis, $BF_{10} = 8.62$. Pairwise comparisons showed that mean ratings for the Low Arousal/Low Valence video segment were significantly lower than those for the Low Arousal/Neutral Valence video clip. For further information for both the Arousal and Valence ratings for men, please refer to table 3.4.2., 3.4.3., 3.4.4., 3.4.5., and 3.4.6.

Finally, independent samples t-tests were conducted in order to observe any differences between the women's Valence and Arousal ratings and those of the men's. All t-tests were found to be non-significant, with the exception of the arousal ratings for the Low Arousal/Neutral Valence video segment, $t(37) = -3.11$, $p = .004$, $d = -1.38$, with strong evidence for the alternative hypothesis, $BF_{10} = 10.37$, as well as the valence ratings for the Low Arousal/Neutral Valence video segment, $t(37) = -3.62$, $p < .001$, $d = -1.61$, with very strong evidence for the alternate hypothesis, $BF_{10} = 30.84$. For both instances, the men's mean ratings were significantly higher than the women's. For further information for both the Arousal and Valence ratings for the contrasts, please refer to table 3.4.8., 3.4.9., 3.5.0., and 3.5.1.

Heart Rate Variability

Data Cleaning

All participants whose entire data was lost were removed from the following analyses (i.e. Participant 21 and 39). In addition, in accordance with the following suggestions from Tabachnick and Fidell (2001), expectation maximization (EM) was used to impute missing data for the following data. EM minimizes the risk of creating artificially inflated correlations and of generating an undefined matrix. Tables 3.5.2. and 3.5.3. provide a summary of the EM correlations between all original and transformed variables after the missing values were substituted through the EM procedure. A limitation of EM is that, if the missing data is not missing completely at random, than patterns explaining the missing data may generalize to the imputation, consequently distorting the results (Tabachnick & Fidell, 2001). As such, all analyses were conducted with and without missing data and any substantive difference between the two will be discussed. Furthermore, due to the small number of male participants, no analyses regarding sex differences were conducted. Finally, all analyses included both male and female participants.

Heart Rate Variability Analyses

Results obtained from the Heart Rate Measure were recorded throughout each of the video segments. In addition, a 3-minute baseline was taken prior to the first participation. As a result, heart rate data for each participant includes: heart rate data at baseline, and during the viewing of the High Arousal/High Valence video segment, the Low Arousal/Neutral Valence video segment, and Low Arousal/Low Valence video segment. From these, participant heart rate variability (HRV) was calculated. Please refer to table 3.5.4. for descriptive statistics.

To begin, a Repeated Measures ANOVA was conducted in order to determine if there were any significant differences in heart rate variability across all conditions and baseline across all participants. The overall model was found to be statistically significant, $F(3, 120) = 3.79$, $p = .01$, $\eta^2 = .09$, with anecdotal evidence for the alternate hypothesis, $BF_{10} = 2.71$. A post-hoc analyses using a Bonferroni correction was conducted, where a significant difference between baseline levels of HRV and HRV for the Low Arousal/Neutral Valence video segment, $M_{diff} = 9.69$, $SE = 2.82$, $t = 3.32$, $p = .01$, $d = .48$, where the overall HRV for baseline was higher than the overall HRV when viewing the Low Arousal/Neutral Valence video clip. These results however should be interpreted with caution, as no significant difference was found when conducting these analyses with the non-imputated data. Please refer to tables 3.5.5., 3.5.6., 3.5.7., information.

In addition to looking at overall HRV, participant baseline data was divided using a Median Split in order to create two distinct groups: individuals with Low frequency HRV (LF-HRV) and individuals with High frequency HRV (HF-HRV). Data from all three video segments were then divided based on the baseline median split. Independent samples t-tests were conducted in order to determine if there were any significant difference between the LF-HRV group and the HF-HRV for baseline, as well as for all three video types. A first significant difference was found between these groups for baseline, $t(39) = -6.75$, $p < .001$, $d = -2.11$, with decisive evidence for the alternate hypothesis, $BF_{10} = 200224$. As expected, the HF-HRV group had higher HRV overall compared to the LF-HRV group. Please refer to tables 3.5.8., and 3.5.9. In addition, a significant difference was also observed for the Low Arousal/Low Valence video segment, $t(39) = -3.59$, $p < .001$, $d = -1.12$, with very strong evidence for the alternate hypothesis, $BF_{10} = 33.78$. Again, the LF-HRV group had lower HRV compared to the HF-HRV group for this video clip. Refer to tables 3.6.2. and 3.6.3. Similarly, the HRV for the LF-HRV group was significantly lower than the HF-HRV group for the Low Arousal/Neutral Valence video segment, $t(39) = -4.66$, $p < .001$, $d = -1.46$, with decisive evidence for the alternate hypothesis, $BF_{10} = 519.1$. Please refer to tables 3.6.4. and 3.6.5. Lastly, a significant difference was found between the LF-HRV and HF-HRV groups for the High Arousal/High Valence video segment, $t(39) = -2.19$, $p = .034$, $d = -.68$, with anecdotal evidence for the alternate hypothesis, $BF_{10} = 1.97$. These last results should be interpreted with caution, as no significant difference was found when conducting these analyses with the non-imputated data. Please refer to table, 3.6.0. and 3.6.1. for further information.

In addition, we were interested in seeing if individuals from the LF-HRV group significantly differed from their baseline HRV levels, as well as the ones from the HF-HRV group. As such, two Repeated Measures ANOVA were conducted in order to determine if there were any significant shifts from baseline. Beginning with the LF-HRV group, although the overall model is significant, $F(3, 57) = 3.77$, $p = .02$, $\eta^2 = .17$, with anecdotal evidence for the alternate hypothesis, $BF_{10} = 3.26$, the pairwise comparisons using a Bonferroni correction indicated no significant shift in HRV from baseline. Please refer to table 3.6.6., 3.6.7., and 3.6.8. for full details. Further, the overall model regarding the Repeated Measures ANOVA for the HF-HRV was significant, $F(3, 60) = .02$, $p = .02$, $\eta^2 = .16$, with anecdotal evidence for the alternate hypothesis, $BF_{10} = 2.92$. A post-hoc analysis using a Bonferroni correction were also conducted and found two significant differences from baseline. The first significant difference was between baseline HRV and the data collected from the Low Arousal/Neutral Valence video segment, $t = 2.85$, $p = .04$, $d = .69$, and the second between baseline HRV and the data collected from the High Arousal/High Valence video segment, $t = 2.82$, $p = .04$, $d = .72$. In both cases, there was a significant decrease in HRV from baseline. For full details please refer to table 3.6.9., 3.7.0., and 3.7.1.

Eye Movement Data.

Eye movement data was transformed into the within-isoline areas for each video segment in order to measure eye movement variability. For descriptive statistics, please refer to table 3.7.2 and 3.7.3. A repeated measures ANOVA was first conducted in order to determine if overall eye movement variability was differed across all video types. This was found to be significant, $F(2, 386) = 63.74$, $p < .001$, $\eta^2 = .25$, with decisive evidence for the alternate hypothesis, $BF_{10} = 2.390 +24$. In addition, a pairwise comparison using a Bonferroni correction was conducted where all video types significantly differed from one another. Specifically, the High Arousal/High Valence video segment was found to have the most eye movement variability overall, *M* = 36957.18, *SD* = 9976.19. Please refer to tables 3.7.5., 3.7.6., and 3.7.7. for full details.

In addition, male and female eye movement variability across video segments was also analysed. Beginning with the men's data, a Repeated Measures ANOVA was conducted to determine if the overall eye movement variability for men was different across all video types. This was found to be significant, $F(2, 1.81) = 44.64$, $p < .001$, $\eta^2 = .32$, with decisive evidence for the alternate hypothesis, $BF_{10} = 3.209e +16$. In addition, a pairwise comparison using a Bonferroni correction was conducted where all video types significantly differed from one another with the exception of the difference between the Low Arousal/Neutral Valence and Low Arousal/Low Valence video segment, which was not significant, $t = .39$, $p = 1$, $d = .05$. Overall, the High Arousal/High Valence video segment maintained the highest level of eye movement variability. Please refer to tables 3.7.8., and 3.7.9., and 3.8.0. for full details. Continuing with the women's data, the same analysis was conducted. This was found to be significant, $F(2, 1.91) = 33.8$, $p < .001$, $\eta^2 = .26$, with decisive evidence for the alternate hypothesis, $BF_{10} = 2.517e +12$. A pairwise comparison using a Bonferroni correction was also conducted where all video types significantly differed from one another, with the exception of the difference between the Low Arousal/Neutral Valence and Low Arousal/Low Valence video segment, which was again not significant, $t = 2.15$, $p = .1$, $d = .37$. Overall, the High Arousal/High Valence video segment maintained the highest level of eye movement variability as well. Please refer to tables 3.8.1., 3.8.2., and 3.8.3. for full details.

Finally, a comparison of men and women's eye movement variability was conducted using a paired samples t-test for each video segment. Beginning with the High Arousal/Low Valence video segment, there was a significant difference between the women's eye movement variability and the men's, $t(402) = 12.78$, $p = .00$, $d = 1.27$, with decisive evidence for the alternate hypothesis, $BF_{10} = 1.795e +28$, where the men maintained higher variability, *M* = 42311.91, *SD* = 9283.39, compared to women, *M* = 31602.45, *SD* = 7465.32. Please refer to table 3.8.4. and 3.8.5. for further details. This was also observed for the Low Arousal/Neutral Valence video segment, where men, *M* = 26146.02, *SD* = 12220.08, had high eye movement variability compared to women, *M* = 20627.86, *SD* = 6392.67, $t(388) = 5.58$, $p = .00$, $d = .56$, with decisive evidence for the alternate hypothesis, $BF_{10} = 241388$. See table 3.8.6. and 3.8.7. for full details. Finally, no significant difference was observed between men's eye movement variability and women's for the Low Arousal/Low Valence video segment. See tables 3.8.8. and 3.8.9. for further details.

Pupillometry

Data Cleaning

As there were only .42% of missing values in the entire dataset of pupillometry data, the missing values were not dealt with (Kline, 2009). Specifically, .06% of pupillometry data was missing for the High Arousal/High Valence condition, .06% for the Low Arousal/Neutral Valence condition, and .3% for the Low Arousal/Low Valence condition.

Pupillometry Analyses

To begin, a Repeated Measures ANOVA was conducted in order to compare overall pupillometry data across all three conditions. Mauchly's test of Sphericity was performed to assess possible violation of the Sphericity assumption; this was significant, $W = .99$, $x^2(2) = 100.80$, $p < .001$. As a result, the Greenhouse-Geisser epsilon value of .99 was used to correct the degrees of freedom used to evaluate the significance of the F ratio. The overall model was found to be statistically significant, $F(1.98, 6674.38) = 589.14$, $p < .001$, $\eta^2 = .15$, . Pairwise comparisons using a Bonferroni correction were conducted, and two significant differences were observed. First, pupillary data from the High Arousal/High Valence video segment indicated more constriction overall compared to those from the Low Arousal/Neutral Valence, $M_{diff} = 173.63$, $SE = 5.93$, $p < .001$. Additionally, pupillary data from the High Arousal/High Valence video segment also indicated more constriction compared to the Low Arousal/Low Valence video segment, $M_{diff} = 166.12$, $SE = 5.49$, $p < .001$. Finally, pupil sizes from the Low Arousal/Low Valence video segment were comparable to those from the Low Arousal/Neutral Valence. Please refer to tables 3.9.0. and 3.9.1.

In addition, three Mixed ANOVA's were conducted in order to determine if there were any sex differences over time (i.e.: the presentation of the video segments). However, due to the possibility of increased alpha-wise error, no pairwise comparisons were conducted. Instead, qualitative assessments were carried out. These consisted of graphing the effect size (i.e.: Cohen's d) of the mean difference between the pupillary data for women from that of the men over the time duration of each video segment. As such, when viewing Figure 1, 2, and 3 pupil data below zero indicates that men's pupils were more dilated than women's, and all pupil data above zero indicates that women's pupil sizes were more dilated than men's. A 95% confidence interval was placed around the effect size of the mean difference, and as such all data points crossing zero indicates no difference in pupil size between men and women. In red we find the data corresponding to the female participants, and in blue the men.

First, a 2x196 mixed ANOVA was conducted for the High Arousal/High Valence video segment. This was not statistically significant, $F(1, 30) = 1.89$, $p = .18$, $\eta^2 = .18$. Upon qualitative inspection of Figure 1, we notice throughout the duration of the video segment that men's pupils were more dilated than women's. In addition, two distinct moments within the video segment caused the largest pupil dilation in men. The first corresponds to the moment in the video where the male actor first penetrates the female actress ("first penetration"). The second corresponds to the beginning of the female actress' orgasm. Thus, we can conclude that the moments within the video that caused the largest pupil dilation relate to rather crucial moments in the video itself. Upon examining Figure 1 we can clearly ascertain that women's pupils are far more constricted than the men's, however there are distinct moments at which there is a sudden increase in pupil dilation. The first occurred around the moment at which the male actor first appears on-screen, and the second, much like men, was at first penetration. The third spike associated to the highest level of pupil dilation for women took place well into the intercourse, approximately 30s before the actress experiences an orgasm.

A second, a 2x99 mixed ANOVA was conducted for the Low Arousal/Low Valence video segment. This was not statistically significant, $F(1, 29) = .09$, $p = .77$, $\eta^2 = .06$. Upon qualitative inspection of Figure 2, we notice throughout the duration of the video segment that again men's pupils are more dilated than women's. Upon further inspection, we identify two distinct moments whereby men's pupils are more dilated than women's. The first occurs when the cameras does a close-up on the male actor that is being penetrated, and the second when the other male actor ejaculates. Again, we see that these moments of pupil dilation occur at marking moments in the video segment. In addition to this, there were two other moments within the video segment that showed no difference in pupil size between men and women that should be noted. The first took place when the camera pan's out to capture both men on screen, and the other when the couple on screen engages in kissing post-ejaculation. When inspecting Figure 2 however, we can see two moments at which women's pupils become noticeably larger. The first occurred just as one of the male actors ejaculates and the other toward the end of his ejaculation.

Finally, a 2x202 mixed ANOVA was conducted for the Low Arousal/Neutral Valence video segment. This was not statistically significant, $F(1, 31) = 2.91$, $p = .09$, $\eta^2 = .17$. Upon qualitative inspection of Figure 3, we notice that unlike the two previous video segments, men and women have far more similar pupil sizes. However, a few moments on interest within the video segment caused an increase in pupil dilation in women that were comparatively larger than that of the men. Notably, women experienced the most pupil dilation at moments in the video segment where the actress on screen moved to a different yoga position (e.g.: plank pose, reverse warrior). In contrast, men experienced an increase in pupil dilation at moments where the actress was most sexually exposed. An example of this occurred when the actress moved to the Warrior pose, where both her genitals and breasts were fully exposed on screen. In instances such as these, were can see the differences in what drives pupil dilation based on sex.

Combination Statistics

SADI and Valence and Arousal Ratings

In order to assess if there was an association between the SADI and the Arousal and Valence ratings, Pearson and Bayesian correlations were conducted between the overall SADI ratings and overall Valence and Arousal ratings per video type. Overall, there were no significant correlation between any component of the SADI and either the Valence and Arousal ratings. For full details of these results, please refer to 3.9.2 and 3.9.3. In addition, both the SADI and Valence and Arousal ratings were divided based on sex in order to assess if any of the associations were sex specific. Beginning with ratings from the female participants, only one significant correlation of interest was found; a positive correlation between the Valence ratings and the Evaluative component of the SADI for the Low Arousal/Low Valence video segment, $r = .46$, $r^2 = .21$, $p = .01$, with substantial evidence for the alternate hypothesis, $BF_{10} = 6.79$. All other correlations were not statistically significant for this category. Please refer to table 3.9.5. and 3.9.6. Moving to the male participants, no significant correlations were observed between any component of the SADI and either the Valence and Arousal ratings. For full details of these results, please refer to table 3.9.3. and 3.9.4.

Heart Rate Variability and Valence and Arousal Ratings

In order to assess if there was an association between participant HRV and the Arousal and Valence ratings, Pearson and Bayesian correlations between overall HRV per video segment and overall Arousal and Valence for each video type were conducted. No significant correlation was found between HRV and Arousal for the High Arousal/High Valence video segment, $r = -.06$, $r^2 = .03$, $p = .10$, with evidence for the null hypothesis, $BF_{10} = .21$, nor the for Low Arousal/Low Valence video segment, $r = -.15$, $r^2 = .02$, $p = .81$, with substantial evidence for the null hypothesis, BF_{10} = .29, nor for the Low Arousal/Neutral Valence video segment, r = -.02, r^2 = .00, p = .89, with substantial evidence for the null hypothesis, BF_{10} = .20. Similarly, no significant correlation between HRV and Valence for the High Arousal/High Valence video segment, r = -.01, r^2 = .00, p = .06, with substantial evidence for the null hypothesis, BF_{10} = .2, nor for the Low Arousal/Low Valence video clip, r = -.19, r^2 = .03, p = .26, with anecdotal evidence for the null hypothesis, BF_{10} = .37, nor for the Low Arousal/Neutral Valence video segment, r = -.03, r^2 = .00, p = .87, with substantial evidence for the null hypothesis, BF_{10} = .20. For full details, please refer to table 3.9.8. and 3.9.9.

In addition, both the HRV and Valence and Arousal ratings were divided based on whether the participants had LF-HRV or HF-HRV at baseline in order to determine if baseline levels of HRV were associated to video ratings. Specifically, the HRV for each video segment was split on whether participants had LF-HRV at baseline or HF-HRV. This was further done to the Valence and Arousal data. As such, Pearson and Bayesian correlations between the HRV and Valence and Arousal ratings were conducted for the LF-HRV group as well as for the HF-HRV group. Please refer to figure 1 for a pictorial representation of the analyses. Beginning with the HF-HRV group, no significant correlations was found between the HRV data and Arousal ratings for the High Arousal/High Valence video segment, r = .05, r^2 = .00, p = .28, with anecdotal evidence for the null hypothesis, BF_{10} = .85, nor the Low Arousal/Low Valence video segment, r = .08, r^2= .01, p = .29, with anecdotal evidence for the null hypothesis, BF_{10} = .73, nor the Low Arousal/Low Valence video segment, r = -.01, r^2= .00, p = .28, with anecdotal evidence for the null hypothesis, BF_{10} = .95. Likewise, no significant correlations were observed between the HRV data and Valence ratings for the High Arousal/High Valence video segment, r = -.07, r^2 = .00, p = .29, with anecdotal evidence for the null hypothesis, BF_{10} = .77, nor for the Low Arousal/Low Valence video segment, r = .02, r^2 = .00, p = .28, with anecdotal evidence for the null hypothesis, BF_{10} = .95, now the Low Arousal/Neutral Valence video segment, r = -.40, r^2 = .16, p = 1.10, with substantial evidence for the null hypothesis, BF_{10} = .09. Please refer to table 3.1.0.0. and 3.1.0.1. for full details

Moving to the LF-HRV group, no significant correlation was found between the HRV data and the Arousal ratings for the High Arousal/High Valence video segment, r = -.12, r^2 = .01, p = .32, with anecdotal evidence for the null hypothesis, BF_{10} = .64, not the Low Arousal/Low Valence video segment, r = .05, r^2 = .00, p = .29, with anecdotal evidence for the null hypothesis, BF_{10} = .85, nor the Low Arousal/Neutral Valence video segment, r = -.11, r^2 = .01, p

= .31, with anecdotal evidence for the null hypothesis, BF_{10} = .65. In addition, no significant correlation was found between the HRV data and Valence ratings for the High Arousal/High Valence video segment, r = .03, r^2 = .00, p = .29, with anecdotal evidence for the null hypothesis, BF_{10} = .90, nor the Low Arousal/Low Valence video segment, r = .18, r^2 = .03, p = .37, with anecdotal evidence for the null hypothesis, BF_{10} = .46, nor the Low Arousal/Neutral Valence video segment, r = -.27, r^2 = .01, p = .50, with substantial evidence for the null hypothesis, BF_{10} = .28. Please refer to table 3.1.0.2. and 3.0.1.3.

Finally, further Pearson and Bayesian correlations were conducted to assess possible sex-specific associations between the HRV and Valence and Arousal ratings. Beginning with the data collected from the female participants, there was no significant correlation between the HRV data and Arousal ratings for the High Arousal/High Valence video segment, r = -.00, r^2 = .00, p = .10, with substantial evidence for the null hypothesis, BF_{10} = .27, nor for the Valence ratings of the same video clip, r = .04, r^2 = .00, p = .84, with substantial evidence for the null hypothesis, BF_{10} = .22. Further, there was no significant correlation between the HRV data and Arousal ratings for the Low Arousal/Low Valence video segment, r = .25, r^2 = .06, p = .16, with anecdotal evidence for the null hypothesis, BF_{10} = .55, nor for the Valence ratings for this same video clip, r = -.03, r^2 = .00, p = .89, with substantial evidence for the null hypothesis, BF_{10} = .22. Finally, there was no significant correlation between the HRV data and Arousal ratings for the Low Arousal/Low Valence video segment, r = -.14, r^2 = .02, p = .45, with substantial evidence for the null hypothesis, BF_{10} = .29, nor for the Valence ratings of this video clip, r = -.18, r^2 = .03, p = .32, with anecdotal evidence for the null hypothesis, BF_{10} = .35. Please refer to 3.1.0.4. and 3.1.0.5.

Continuing with the data collected from the male participants, there was no significant correlation between the HRV data and Arousal ratings for the High Arousal/High Valence video segment, r = -.09, r^2 = .01, p = .87, with evidence for the null hypothesis, BF_{10} = .50, nor for the Valence ratings of the same video clip, r = .06, r^2 = .00, p = .91, with anecdotal evidence for the null hypothesis, BF_{10} = .49. Further, there was no significant correlation between the HRV data and Arousal ratings for the Low Arousal/Low Valence video segment, r = .58, r^2 = .33, p = .23, with anecdotal evidence for the null hypothesis, BF_{10} = .91, nor for the Valence ratings for this same video clip, r = -.05, r^2= .00, p = .92, with anecdotal evidence for the null hypothesis, BF_{10} = .49. Finally, there was no significant correlation between the HRV data and Arousal ratings for the Low Arousal/Low Valence video segment, r = .64, r^2 = .41, p = .17, with anecdotal evidence for the alternative hypothesis, $BF_{10} = 1.11$, nor for the Valence ratings of this video clip, $r = .33$, $r^2 = .11$, $p = .53$, with anecdotal evidence for the null hypothesis, $BF_{10} = .59$. Please refer to table 3.1.0.6. and 3.1.0.7. for full details

Heart Rate Variability and Eye Movement Variability

In order to assess if there was an association between participant HRV and EMV, Pearson and Bayesian correlations between overall HRV and EMV for each video type were conducted. No significant correlation was found between the HRV and EMV for the High Arousal/High Valence video segment, $r = -.29$, $r^2 = .08$, $p = .13$, with anecdotal evidence for the null hypothesis, $BF_{10} = .86$; for the Low Arousal/Neutral Valence video segment, $r = .03$, $r^2 = .00$, $p = .87$, with anecdotal evidence for the null hypothesis, $BF_{10} = .46$; nor for the Low Arousal/Low Valence video segment, $r = -.00$, $r^2 = -.00$, $p = .99$, with evidence for the null hypothesis, $BF_{10} = .21$. Please refer to table 3.1.0.8. and 3.1.0.9. for full details.

In addition, further Pearson and Bayesian correlations were conducted to assess possible sex-specific associations between HRV and EMV. Beginning with women, there was no significant correlation between the HRV data and EMV data for the High Arousal/High Valence video segment, $r = -.29$, $r^2 = .08$, $p = .10$, with anecdotal evidence for the null hypothesis, $BF_{10} = .80$; for the Low Arousal/Low Valence video segment, $r = -.07$, $r^2 = .00$, $p = .71$, with substantial evidence for the null hypothesis, $BF_{10} = .23$; nor the Low Arousal/Neutral Valence video segment, $r = .23$, $r^2 = .05$, $p = .18$, with anecdotal evidence for the null hypothesis, $BF_{10} = .50$. Please refer to table 3.1.1.3. and 3.1.1.4. for full details. Moving to the data acquired from the male participants, there was no significant correlation between the HRV and EMV data from the High Arousal/High Valence video segment, $r = .67$, $r^2 = .45$, $p = .15$, with anecdotal evidence for the alternative hypothesis, $BF_{10} = 1.21$; for the Low Arousal/Low Valence video segment, $r = -.12$, $r^2 = .02$, $p = .82$, with anecdotal evidence for the null hypothesis, $BF_{10} = .50$; nor for the Low Arousal/Neutral Valence video segment, $r = .24$, $r^2 = .06$, $p = .65$, with anecdotal evidence for the null hypothesis, $BF_{10} = .54$. Please refer to table 3.1.1.0. and 3.1.1.1. for full details.

Heart Rate Variability and Pupillometry

In order to assess if there were any associations between the HRV and the Pupillometry data, Pearson and Bayesian correlations were conducted whereby the overall HRV data per video type was correlated to the overall pupillary data per video type. No significant correlation was found between the HRV and pupillary data for the Low Arousal/Neutral Valence video segment, $r = .13$, $r^2 = .02$, $p = .41$, with substantial evidence for the null hypothesis, $BF_{10} = .27$.

Additionally, there was no significant correlation between the HRV and pupillary data for the Low Arousal/Low Valence video segment, *r* = .22, r^2 = .05, *p* = .16, with anecdotal evidence for the null hypothesis, BF_{10} = .50. Finally, no significant difference was found between the HRV and pupillary data for the High Arousal/High Valence video segment, *r* = .05, r^2 = .003, *p* = .78, with substantial evidence for the null hypothesis, BF_{10} = .20. Please refer to table 3.1.1.5. and 3.1.1.6 for full details.

In addition, further Pearson and Bayesian correlations were conducted to assess possible sex-specific associations. Beginning with women, no significant correlation was found between the HRV data and pupillometry data for the High Arousal/High Valence video clip, *r* = .01, r^2 = .00, *p* = .96, with substantial evidence for the null hypothesis, BF_{10} = .21. Similarly, there were no significant correlation for the Low Arousal/Low Valence video segment, *r* = -.07, r^2 = .01, *p* = .68, with substantial evidence for the null hypothesis, BF_{10} = .23. Finally, there was again no significant correlation for the Low Arousal/Neutral Valence video segment, *r* = .08, r^2 = .01, *p* = .63, with substantial evidence for the null hypothesis, BF_{10} = .24. Please refer to table 3.1.1.7. and 3.1.1.8. for full details.

With regards to data collected from male participants, there was no significant correlation between the HRV data and Pupillometry data for the High Arousal/High Valence video segment, *r* = .38, r^2 = .15, *p* = .45, with anecdotal evidence for the null hypothesis, BF_{10} = .63. There was again no significant correlation for the Low Arousal/Low Valence video segment, *r* = -.42, r^2 = .18, *p* = .41, with anecdotal evidence for the null hypothesis, BF_{10} = .66. Finally, there was no significant correlation for the Low Arousal/Low Valence video clip either, *r* = .57, r^2 = .32, *p* = .94, with anecdotal evidence for the null hypothesis, BF_{10} = .89. Please refer to 3.1.1.9. and 3.1.2.0. for full details.

Eye Movement Variability and Valence and Arousal Ratings

In order to assess if there were any associations between EMV and Valence and Arousal Ratings, Pearson and Bayesian correlations were conducted whereby the overall EMV data per video type was correlated to the overall Valence and Arousal ratings per video type. No significant correlation was observed between the EMV data of the High Arousal/High Valence and Arousal ratings for this same video, *r* = -.17, r^2 = .03, *p* = .31, with anecdotal evidence for the null hypothesis, BF_{10} = .33, nor was there a significant correlation between the EMV and Valence ratings for the same video segment, *r* = .14, r^2 = .02, *p* = .40, with substantial evidence for the null hypothesis, BF_{10} = .28. Similarly, no significant correlations were found between the

EMV data and Arousal ratings for the Low Arousal/Low Valence video segment, $r = .11$, $r^2 = .01$, $p = .49$, with substantial evidence for the null hypothesis, $BF_{10} = .25$, nor between the EMV data and the Valence ratings for the same video clip, $r = -.03$, $r^2 = .00$, $p = .86$, with substantial evidence for the null hypothesis, $BF_{10} = .20$. Finally, there were again no significant correlations between the EMV data and the Arousal ratings for the Low Arousal/Neutral Valence video segment, $r = .02$, $r^2 = .00$, $p = .93$, with substantial evidence for the null hypothesis, $BF_{10} = .2$, nor between the EMV data and the Valence ratings for this video segment, $r = -.22$, $r^2 = .05$, $p = .17$, with anecdotal evidence for the null hypothesis, $BF_{10} = .49$. Please refer to table 3.1.2.1. and 3.1.2.2. for full details.

In addition, EMV data and Valence and Arousal ratings were separated based on sex and further Pearson and Bayesian correlations were conducted. Beginning with the data collected from the female participants, no significant correlations were observed between the EMV for the High Arousal/High Valence video segment and Arousal ratings, $r = -.07$, $r^2 = .01$, $p = .68$, with substantial evidence for the null hypothesis, $BF_{10} = .23$, nor between the EMV for this video segment and Valence ratings, $r = .19$, $r^2 = .04$, $p = .29$, with anecdotal evidence for the null hypothesis, $BF_{10} = .37$. Likewise, no significant correlations were found between the EMV data for the Low Arousal/Low Valence video segment and Arousal ratings, $r = -.09$, $r^2 = .01$, $p = .59$, with anecdotal evidence for the null hypothesis, $BF_{10} = .25$, and Valence ratings, $r = -.02$, $r^2 = .00$, $p = .33$, with substantial evidence for the null hypothesis, $BF_{10} = .22$. Finally, no significant correlations between the EMV data from the Low Arousal/Neutral valence video segment and Arousal ratings, $r = .08$, $r^2 = .01$, $p = .65$, with substantial evidence for the null hypothesis, $BF_{10} = .24$, and Valence ratings, $r = -.28$, $r^2 = .08$, $p = .12$, with anecdotal evidence for the null hypothesis, $BF_{10} = .68$. Please refer to table 3.1.2.3. and 3.1.2.4. for full details.

Moving to the data collected from the male participants, no significant correlations were found between the EMV data for the High Arousal/High Valence video clip and Arousal ratings, $r = -.64$, $r^2 = .41$, $p = .17$, with anecdotal evidence for the alternate hypothesis, $BF_{10} = 1.09$, and Valence ratings, $r = .18$, $r^2 = .03$, $p = .74$, with anecdotal evidence for the null hypothesis, $BF_{10} = .52$. With regards to the EMV data relating to the Low Arousal/Low Valence video segment, there was still no correlation with the Arousal ratings, $r = -.12$, $r^2 = .01$, $p = .82$, with evidence for the anecdotal null hypothesis, $BF_{10} = .50$, nor the Valence ratings, $r = .20$, $r^2 = .04$, $p = .69$, with anecdotal evidence for the null hypothesis, $BF_{10} = .53$. Finally, there were no significant correlations between the EMV data from the Low Arousal/Neutral Valence video segment and the Arousal ratings, $r = .44$, $r^2 = .19$, $p = .38$, with anecdotal evidence for the null hypothesis, $BF_{10} = .69$. Please refer to table 3.1.2.5. and 3.1.2.6. for full details.

Eye Movement Variability and Pupillometry

In order to assess if there were any associations between EMV and Pupillometry data, Pearson and Bayesian correlations were conducted whereby the overall EMV data per video type was correlated to the overall Pupillometry data per video type. There was no significant correlation between the EMV and Pupillometry data for the High Arousal/High Valence video segment, $r = -.06$, $r^2 = 00$, $p = .32$, with evidence for the null hypothesis, $BF_{10} = .10$, nor for the Low Arousal/Low Valence video segment, $r = .44$, $r^2 = .00$, $p = .44$, with substantial evidence for the null hypothesis, $BF_{10} = .07$. There was, however, a significant negative correlation was observed between the EMV and Pupillometry data for the Low Arousal/Neutral Valence video segment, $r = -.14$, $r^2 = .02$, $p = .01$, with anecdotal evidence for the alternate hypothesis, $BF_{10} =$ 1.250e +14. Please refer to table 3.1.2.7. and 3.1.2.8. for full details.

In addition, EMV data and Pupillometry data were separated based on sex and further Pearson and Bayesian correlations were conducted. Beginning with women, there was a significant negative correlation between the EMV and Pupillometry data for the High Arousal/High Valence video segment, $r = -.15$, $r^2 = .02$, $p = .03$, but with anecdotal evidence for the null hypothesis, $BF_{10} = .81$, as well as for the Low Arousal/Low Valence video segment, $r = -.21$, $r^2 = .04$, $p = .04$, but with anecdotal evidence for the null hypothesis, $BF_{10} = .96$. There was no significant correlation between the EMV and Pupillometry data for the Low Arousal/Neutral Valence, $r = .08$, $r^2 = .01$, $p = .27$, with substantial evidence for the null hypothesis, $BF_{10} = .17$. Please refer to table 3.1.3.1. and 3.1.3.2. for full details. As for the men, there was no significant correlation between the EMV and Pupillometry data for the High Arousal/High Valence video segment, $r = -.06$, $r^2 = .00$, $p = .42$, with substantial evidence for the null hypothesis, $BF_{10} = .12$, nor for the Low Arousal/Neutral Valence video segment, $r = .02$, $r^2 = .00$, $p = .77$, with substantial evidence for the null hypothesis, $BF_{10} = .09$. There was, however, a significant negative correlation between the EMV and Pupillometry data for the Low Arousal/Low Valence video segment, $r = -.27$, $r^2 = .07$, $p = .01$, with anecdotal evidence for the alternate hypothesis, $BF_{10} = 2.97$. Please refer to table 3.1.2.9. and 3.1.3.0. for full details.

Pupillometry and Valence and Arousal Ratings

In order to assess if there were any associations between the Pupillometry data and the Valence and Arousal ratings, Pearson and Bayesian correlations were conducted whereby the overall pupillary data per video type was correlated to the overall Valence and Arousal data per video type. Beginning with the High Arousal/High Valence video segment, there was no significant correlation between the pupillary data and arousal ratings, $r = -.03$, $r^2 = .00$, $p = .88$, with evidence for the null hypothesis, $BF_{10} = .20$, nor between the pupillary data and valence ratings, $r = -.28$, $r^2 = .08$, $p = .09$, with anecdotal evidence for the null hypothesis, $BF_{10} = .83$. This was also the case for the Low Arousal/Neutral Valence video segment, were there was no significant correlation between the pupillary data and arousal ratings, $r = -.08$, $r^2 = .01$, $p = .64$, with substantial evidence for the null hypothesis, $BF_{10} = .22$, nor between this same data and the valence ratings, $r = .24$, $r^2 = .06$, $p = .14$, with anecdotal evidence for the null hypothesis, $BF_{10} = .58$. Finally, there was a significant positive correlation between the pupillary data and arousal ratings for the Low Arousal/Low Valence video segment, $r = .33$, $r^2 = .11$, $p = .04$, with anecdotal evidence for the alternate hypothesis, $BF_{10} = 1.55$, but no significant correlation with the valence ratings, $r = .23$, $r^2 = .05$, $p = .15$, with anecdotal evidence for the null hypothesis, $BF_{10} = .54$. Please refer to table 3.1.3.3. and 3.1.3.4. for further details.

In addition, EMV data and Pupillometry data were separated based on sex and further Pearson and Bayesian correlations were conducted. Beginning with women, there was no significant correlation between the pupillary data and arousal ratings for the High Arousal/High Valence video segment, $r = .01$, $r^2 = .05$, $p = .57$, with substantial evidence for the null hypothesis, $BF_{10} = .25$, nor with the valence ratings, $r = -.04$, $r^2 = .00$, $p = .82$, with substantial evidence for the null hypothesis, $BF_{10} = .22$. This was also the case for the Low Arousal/Low Valence video segment, where no significant correlation was found between the pupillary data and arousal ratings, $r = -.23$, $r^2 = .05$, $p = .21$, with anecdotal evidence for the null hypothesis, $BF_{10} = .47$, nor with the valence ratings, $r = -.07$, $r^2 = .01$, $p = .69$, with substantial evidence for the null hypothesis, $BF_{10} = .23$. Finally, there was no significant correlation between the pupillary data and the arousal ratings for the Low Arousal/Neutral Valence video segment, $r = .17$, $r^2 = .03$, $p = .34$, with anecdotal evidence for the null hypothesis, $BF_{10} = .34$, nor with the valence ratings, $r = .13$, $r^2 = .02$, $p = .46$, with substantial evidence for the null hypothesis, $BF_{10} = .28$. Please refer to table 3.1.3.7. and 3.1.3.8. for further details.

With regards to the data collected from the male participants, there was no significant correlation between the pupillary data and arousal ratings for the High Arousal/High Valence video segment, $r = .62$, $r^2 = .39$, $p = .18$, but with anecdotal evidence for the alternate hypothesis, $BF_{10} = 1.03$, nor with the valence ratings, $r = .37$, $r^2 = .14$, $p = .47$, with anecdotal evidence for the null hypothesis, $BF_{10} = .62$. This was also the case for the Low Arousal/Neutral Valence video segment, where no significant correlation was found between the pupillary data and the arousal ratings, $r = .17$, $r^2 = .02$, $p = .77$, with anecdotal evidence for the null hypothesis, $BF_{10} = .51$, nor with the valence ratings, $r = -.03$, $r^2 = .00$, $p = .95$, with anecdotal evidence for the null hypothesis, $BF_{10} = .49$. There was, however, a significant negative correlation between the pupillary data and arousal ratings for the Low Arousal/Low Valence video segment, $r = -.92$, $r^2 = .58$, $p = .01$, with strong evidence for the alternate hypothesis, $BF_{10} = 7.01$, however not so for the valence ratings, $r = -.40$, $r^2 = .16$, $p = .42$, with anecdotal evidence for the null hypothesis, $BF_{10} = .65$. Please refer to table 3.1.3.5. and 3.1.3.6. for full details.

Discussion

The aim of the current thesis was to identify objective markers of sexual arousal that were concordant with responses obtained from subjective assessments. As a result, the discussion addressing the “why” behind this goal has been discussed at length throughout this paper. The most notable of the themes examined is the notion that not only have the existing methods inadvertently shed light on their own limitations, but that the use of these has uncovered a mystery in the field of sexual behaviour: that of female concordance (or lack thereof) between objective and subjective measures of arousal. Indeed, the use of traditional measures objective measures such as vaginal plethysmography and genital thermography in research pertaining to sexual behaviour has revealed that these measures appear to capture genital/physiological arousal that is independent of participants’ subjective arousal. This then raises the question that at least in women, physiological arousal may not necessarily be the same as subjective arousal. With this statement in mind, the aim of the current thesis was explore other objective measures in an attempt to identify one that was concordant with subjective responses of both male and female participants. This was done with real time recordings of EM, pupillometry, and HRV while participants were watching one of three validated sexually explicit video segments that ranged in levels of valence and arousal. These video segments, as validated in Chapter 2 of this thesis, consisted of videos containing heterosexual intercourse (i.e., High Arousal/High Valence, most preferred); a young woman performing a naked yoga routine (i.e., Low Arousal/Neutral Valence, neutral); and male homosexual intercourse (i.e., Low Arousal/Low Valence, least preferred). Several hypotheses pertaining to each video category were derived from the overall goal of this thesis. In the following paragraphs, these will be discussed per video segment as well as per objective measure. In addition to this, limitations, recommendations, and future directions will be discussed for each of aforementioned categories.

High Arousal/High Valence – Heterosexual Intercourse Video Segment

Valence and Arousal

Beginning with the subjective responses obtained in response to the videos, a first hypothesis concerning the heterosexual intercourse video segment was that it would be subjectively rated higher on the valence and arousal scales by our heterosexual participants. This was confirmed. In the first study outlined in this thesis (Chapter 2) the video segments portraying heterosexual intercourse were rated as most preferred through both arousal and valence ratings. Using these data, were able to select the video segment that would be utilized in the second study, as it was found to have the highest ratings in comparison to the other heterosexual intercourse video segments. It was then hypothesised that the ratings obtained from the first study would not be statistically significantly different from those collected in the second study. This was also confirmed. As a result, this adds support to the validity that the heterosexual video segment used elicits higher ratings and subjective levels of arousal and valence. In addition, no participant sex differences were observed for this video (i.e., both male and female participants rated the images the same for valence and arousal).

SADI

The addition of the ratings obtained from the SADI allowed for a more detailed interpretation of the subjective assessments of this video segment. Beginning with the Evaluative component of the SADI, this section of the measurement focuses on a list of words that identify the cognitive-emotional state of the participant with regards to their sexual arousal and desire at the present moment (e.g.: enthusiastic, passionate, sensual, seductive; Toledano & Pfaus, 2006). Of all the video segments, the heterosexual intercourse clip maintained the highest ratings. This allowed us to conclude that this video clip elicited higher levels of cognitive-emotional appraisals of arousal and desire overall. Moving on to the negative component of the SADI, this section investigates the aversive or inhibitory component of sexual arousal and desire (e.g.: restrained, anxious, unhappy, repulsion; Toledano & Pfaus, 2006). Overall, the ratings for the heterosexual intercourse clip were low, indicating that this video segment elicited no (or little) aversive or negative feelings. The third component of the SADI, the physiological component, allows participants to assess and describe the physical component of sexual arousal and desire (e.g.: Flushed, genitals reddish, heart beats faster, sensitive to touch; Toledano & Pfaus, 2006).

The ratings here, much like those obtained from the evaluative component, were the highest compared to the other two video types. This led us to conclude that this video segment elicited a strong physiological reaction as well as a cognitive-emotional one. Finally, the motivational component of the SADI assesses the general desire or motivation to engage in sexual contact (e.g.: Anticipatory, impatient, horny, urge to satisfy; Toledano & Pfaus, 2006). Again, of all video segments, the heterosexual intercourse video maintained the highest ratings, leading us to conclude that this video elicited the greatest desire to engage in sexual activity.

Some sex differences were observed in the response to the SADI. Where as men rated this video higher than women on the evaluative component, women rated it higher on the physiological component. As such, although this was indeed the most preferred video, men and women experienced it differently. On the one hand, women experienced their sexual arousal and desire more physically than men, where as men more on a cognitive and evaluative perspective. This is quite contrary to popular belief that women experience their sexual arousal and desire more cognitively and men more physically. This could be explained simply with the difference in sample size, as there were fewer male participants compared to female participants.

Eye Tracking and Eye Movement Variability

With the above results in mind, we conclude that the heterosexual video segment was most preferred, as it produced the highest amount of positive emotional and physiological states. It is speculated that this was due to the fact that the participants of interest for both studies were self-identified heterosexual men and women. As such, the use of this video segment is indeed recommended with the purpose of eliciting subjective positive sexual arousal in heterosexual men and women.

In an attempt to overcome the limitations of traditional objective measures used when studying sexual behaviour (i.e., vaginal/penile plethysmograph, genital thermography), we opted to use three different tools that have gained new interest and popularity amongst sex researchers in the second study of this thesis: ET, pupillometry, and HRV. Beginning with ET, this technology has been employed by several fields, including vision research focusing on scene perception and clinical research concerning attentional processes (Wenzlaff et al., 2016). Within the field of sexual research, ET has almost exclusively been used to measure eye movements (i.e., fixations and saccades) when viewing sexually explicit images (e.g., Lykins, Meana, & Kambe, 2006; Dawson & Chivers, 2016). In the current thesis, we decided to take the research a step further, and apply it to video stimuli. Previous research utilizing eye tracking on sexual image processing has found differences in viewing patterns between heterosexual men and women. Specifically, it has been demonstrated that women exhibit non-specific viewing patterns when observing both preferred and non-preferred sexual images (Chivers et al., 2004; Chivers, 2005; Chivers & Bailey, 2005; Chivers et al., 2010). Research conducted by Farisello et al. (2017) identified that women would look at the face, pelvic, and then chest regardless of arousal rating or sex of the actor in the image. Conversely, men have been shown to exhibit more specificity when viewing erotic images, whereby they direct their attention to the pelvic, face, then chest when viewing preferred images, and the face, chest, and then pelvic when viewing non-preferred images (Farisello et al., 2017). As such, it was hypothesized that overall there would be little EMV for the heterosexual intercourse video segment, as all participants should find the same items on the screen to be salient and attention capturing. This was unfortunately not the case, as overall this video segment produced the most amount of EMV compared to the other two video segments. With regards to sex differences, based on previous research described in the introduction, it was hypothesized that women would exhibit higher degree of EMV, whereas men would have lower EMV. This hypothesis was also not supported, as overall men and women displayed a large degree of EMV when viewing the heterosexual video segment in comparison to the other two videos. In addition, in comparison to women, men showed higher EMV when viewing this video clip. Of greatest importance to this thesis however was to find an objective measure of sexual arousal that was concordant with the subjective responses associated to each video type. In order to determine if EMV was related to subjective ratings of arousal and valence, we correlated the eye movement data with these ratings. Unfortunately, no significant correlations were observed.

Although the results obtained with regards to EMV were unexpected, a few limitations could explain the discrepancy between the hypothesis and results. To begin, the way in which the video was filmed may have contributed to the increased EMV overall. The heterosexual video was shot in such a way that, to our benefit, the camera was immobile over the course of the video. Unfortunately, the camera was set to film at a very wide shot, giving the opportunity to the participants to direct their attention to a multitude of other objects and locations, away from the actors on screen. Indeed, when looking at the eye movements qualitatively over the course of this video segment, we notice that during the first minute of the video participants keep their eyes on the couple. After this first minute, the eye movements become more scattered. As vision is an active process, viewers naturally tend to seek out as much visual task-relevant information as possible (Henderson, 2003). Thus, one would assume that the more visual information one is offered, the more there will be variability in eye movements. This would have distracted the participants from keeping their attention on the couple on-screen. This can be explained by the concept of Inhibition of Return. This process is one in which humans have natural tendency to orient their attention toward novel stimuli (Klein, 2000). As the couple on-screen does not change positions until after the female orgasm, it may be that participants gathered as much salient information as they could about the performance, or became bored with the stimulus. Thus, they started to shift their attention to the rest of the surroundings visible in the wide-frame shot of the video, only to shift it back to the couple as they actress got closer to her orgasm. As such, one future recommendation would be to select a video that was filmed with a medium-to-close up shot, while still remaining as stable as possible.

A second limitation that could contribute to the results pertaining to the male participants was the fact that this video was only validated using a female sample (Chapter 2). This, of course, could have affected their eye movements, as this video may not have been rated as highly by a sample of heterosexual men. As such, it is recommended that this video be used for female participants. In addition, a future direction directly linked to this limitation is to validate this video segment using a male sample. In addition, including a larger number of male participants to be equal to the number of female participants in the second study of this thesis would also be highly recommended, as this would allow for more robust results regarding possible sex differences.

A final limitation worth noting that could contribute to the null-results obtained when correlating the subjective ratings to the eye movement data is that perhaps the type of statistics used were not appropriate for the kind of data gathered. Pleas refer to the section below titled “Statistical Limitations” for a full account regarding this limitation. It is worth noting however that this limitation is not specific to this study, as it is still the convention to correlate subjective ratings to physiological responses. As this is the case, more efforts should be invested in using and perhaps even developing more appropriate statistics that can accurately predict physiological responses from subjective data.

Heart Rate Variability

The second objective measure used in Chapter 3 of this thesis was HRV. Briefly, HRV is a measure of the interaction between the SNS and PNS, and their influences on heart rate (Appelhans & Luecken, 2006). This metric provides information about the flexibility of ones’

ANS, which translates to ones' emotion regulation capacity (Appelhans & Luecken, 2006). Previous research interested in this measure has been focused of finding the psychological correlates of shifts in overall state HRV. A review regarding HRV as a biomarker for psychopathology by Rottenberg and Thayer (2007) asserts that experiencing negative affect is correlated with a decrease in HRV. In addition, this decrease has also been found to indicate that individuals are engaging in allocating self-regulatory mechanisms (Rottenberg & Thayer, 2007; Kim et al., 2018). Additionally, research interested in HRV has also uncovered that there are two levels of trait HRV that also correlate with other psychological factors. Indeed, two distinct categories of individuals were uncovered: those with HF-HRV at rest and those with LF-HRV at rest. Those who fall under the category of HF-HRV have been identified as individuals who have both better state and trait emotion regulation skills when faced with hardships compared to their LF-HRV counterparts (Thayer et al., 2012).

This provided us with the understanding that much of the research that has been done with regards to the connection between HRV and emotions has focused on negative emotions, leading us to question if HRV is also associated to positive emotions, such as those elicited by positive sexual arousal. A recent study conducted by Choi et al., (2017) endeavoured to address this issue. They aimed to validate HRV as an objective tool to measure emotion. They did so by presenting participants with three categories of images selected from the IAPS database (i.e., Unhappy, Neutral, and Happy; Bradley & Lang, 1994) while simultaneously recording their HRV. They found a positive correlation between Valence and HRV, but only for the images under the "Unhappy" condition.

The results discussed above add to the theory that HRV is an indicator of negative emotions/affect, as little to no research has demonstrated a link between HRV and positive affect. In addition, little work has been done on this particular connection while using video stimuli (e.g., Lane et al., 2009; Bos et al., 2013). As such, the inclusion of this measurement in the current thesis was done in an exploratory fashion. As a result, no singular hypothesis concerning the connection between HRV and the heterosexual intercourse video segment was put forward. Results collected from Chapter 3 of this thesis indicated that overall, the recorded HRV from participants viewing the heterosexual intercourse video segment was no different than those recorded for the other two video clips as well as from baseline. This would indicate that viewing this video segment did not cause a significant shift in in autonomic activity. As with the eye movement data, the HRV data was correlated with the valence and arousal ratings in an in an attempt to identify if this objective measure was concordant with the subjective responses. Again, no significant correlations were found.

In addition to overall HRV, we were also interested in differences based on baseline levels of HRV. As mentioned earlier, these trait levels of HRV are indicative of how well one manages their affective responding, where those with HF-HRV have been found to have better emotion regulation abilities and those with LF-HRV are less able to do so. A previous study conducted by Bos et al., (2013) attempted to determine the role of baseline HRV when viewing sexually explicit video segments, among other video categories. Specifically, they were interested in the relationship between baseline levels of HRV related to affective responding to the video clips, which was elicited by a startle probe that was introduced at random intervals throughout each video clip. Overall, researchers conclude that the participants with baseline LF-HRV displayed affective responding caused by the startle probe regardless of the video categories. Conversely, those with HF-HRV at baseline were better able to differentiate their affective responding to the startle probe across the different video segments. These results offer insight into differences in affective responding between individuals with LF-HRV and those with HF-HRV overall. However, the results do not offer insight regarding the specific behaviours and responses associated to these categories of individuals with respect to erotic stimuli. As such, we divided our participant data based on whether they had HF-HRV or LF-HRV at baseline (using a median split) in an attempt to see if there were any significant differences in HRV between these two categories of individuals when viewing each of the video clips. Interestingly, participants in the HF-HRV group maintained higher levels of HRV when viewing the heterosexual intercourse video segment, much like those in the LF-HRV group maintained lower levels of HRV when viewing this clip.

We also decided to compare the baseline HRV levels to those collected during each experimental condition for each of these groups. When looking at the LF-HRV group, none of the HRV data from the experimental conditions significantly differed from baseline. This was not the case for the HF-HRV group, as the HRV data collected from the heterosexual intercourse video segment was significantly lower than baseline. This caused us some confusion as, for one, previous research has clearly indicated that a decrease in HRV is indicative of negative affect (Beauchaine & Thayer, 2007), and yet the video in question was subjectively rated as arousing and attractive. For two, as previously stated, individuals with HF-HRV have been shown to have better emotion-regulation skills, further adding to the confusion. As a result, we can put forward two theories that might explain these results. To begin, due to a large loss of data, no analyses concerning sex differences were conducted. As such, it is possible that one of the sexes may have behaved in a particular fashion so as to have brought down the HRV for this particular video. Additionally, as the nature of the video itself was explicitly sexual in nature, participants may have experienced an increase in positive arousal when viewing the video that may have engaged in inhibitory processes in order to subconsciously help control their responses. This could be due to stress caused by experiencing such emotions in an experimental setting, or even because they were not expecting to experience them at all.

A few limitations concerning the HRV measure must be addressed. The first consisted of the overall loss of data associated specifically to the heart rate measure. Participants moving their hand throughout the presentation of the video segments caused a loss of usable data, as hand movements would have increased the noise in the photoplethysmograph sensor data by adding unnecessary artefacts. In addition, hand movements could have potentially moved the plethysmograph in such a way that it was no longer recording the participant heart rate. As such, some participants were missing heart rate data for one or more of the video clips. In addition, participants whose baseline data was missing were removed from all analyses all together. These losses also affected our ability to determine if there were any sex differences, as the data obtained from the male participants was too reduced to any conduct appropriate comparison analyses. Further, much like for the eye movement data, we believe that the type of statistics used was not appropriate for the kind of data gathered. Pleas refer to the section below titled "Statistical Limitations" for a full account regarding this limitation.

As a result of these limitations, it is recommended that a larger overall sample with equal numbers of men and women be used for any replication of the study in question. This is not only due to possible loss of data, but also to allow for analyses regarding sex differences, as well as more robust results regarding possible differences based on participant baseline HRV levels. In addition, an increase in sample size would also allow for the application of more appropriate statistical analyses on the HRV data, such as those discussed in the "Statistical Limitations" section. In doing so, more quantitative information concerning the HRV trajectory over time could be gathered.

Pupillometry

The last objective measure we were interested in for the purpose of this thesis was the changes in pupil dilation/constriction when viewing the different videos. Previous research in the field of Sexual Behaviour interested in pupillometry originates back to the 1960's, where the "attraction-dilation, aversion-constriction" hypothesis was first introduced (Hess & Polt, 1960). A study conducted by Hess, Seltzer, and Shlien (1965) based themselves off of this hypothesis when they presented a series of sexually explicit images to a sample of heterosexual and homosexual men while monitoring changes in pupil size. Results indicated a significant increase in pupil dilation when heterosexual men were viewing images of women, whereas homosexual men showed the same increase but when viewing images of other men. Moving forward in time, researchers interested in the association between pupillary responses and erotic material aimed to understand the mechanisms involved in this association. This led to the understanding that emotional arousal, both positive and negative, elicits an increase in pupil dilation as mediated by the sympathetic activity (Bradley, Miccoli, Escrig, & Lang, 2008). However, a recent study conducted by Finke et al., (2017) adapted the "attraction-dilation, aversion-constriction" hypothesis by attempting to uncover specific pupillary nuances between men and women when viewing erotic images. In doing so, they demonstrating that, when viewing erotic images, women experienced similar late-pupillary changes when viewing all types of erotic images. Men, on the other hand, only experienced late pupil dilation when viewing opposite-sex images. Thus, much like previous research has demonstrated (e.g., Chivers et al., 2004; Chivers et al., 2015), women showed a lack of specificity in their physiological response to erotic stimuli, contrary to men who do exhibit specificity. Little to no research has been conducted to investigate the link between pupillary changes and subjective ratings using video stimuli. With this in mind, the inclusion of this measurement in the current thesis was done in an exploratory fashion, and as such, no hypothesis was put forward.

The results obtained from Chapter 3 demonstrated that overall, for the heterosexual intercourse video segment, participants experienced more pupil constriction compared to both the neutral and homosexual intercourse video segments. This goes against the "attraction-dilation, aversion-constriction" hypothesis, as participants subjectively rated this video as arousing, yet maintained higher levels of constriction compared to the other two video segments, which were rated as less preferred and arousing. A possible explanation regarding these results strays away from the psychological perspective to the purely physiological. As is well known, the primary function of the pupil is to control the amount of light that falls onto the retina using what is called the "pupillary light reflex". As such, perhaps the composition of the video with regards to luminance affected the overall pupil sizes to be more constricted in the heterosexual intercourse video segment compared to the other two videos. In order to address this limitation, it would normally be recommended to control for luminance across all stimuli, as this process is often done with images. For videos however this procedure is difficult and can alter the composition of the video itself. As such, it would be recommended to find videos with similar luminance overall.

We then further divided these data based on sex, and were able to qualitatively determine differences in pupil dilation and constriction over the course of the video segments. With regards to the heterosexual intercourse video segment, the first thing to take note of is that men's pupils are more dilated than the women's (Figure 1). Thus, as the sample used for this experiment consisted mostly of women, this result helps explain why the overall pupillary data indicated higher levels of constriction overall. With regards to the male participants, two distinct moments within the video segment caused the largest increase in pupil dilation. The first involved the first penetration by the male on the female, and the second at the beginning of the orgasm by the female actress. Conversely, although women were overall more constricted than the men, they too had distinct moments of sudden increase in pupil dilation. The first occurred when the male actors appears on-screen for the first time, with the second difference taking place during the first penetration (at a time point similar to the males). However, there was also a third spike that transpired as the actors were well into the intercourse, approximately 30s before the woman's orgasm. This point in the video is at an arbitrary point in the video segment, making it difficult to interpret. However, it does not take away from the fact that both men and women experienced peaks in pupil dilation at very distinct moments within the video segment. However, where as men seemed to have maintained steady pupil dilation over the course of the video segment, women maintained steady constriction until moments of increased arousal.

Low Arousal/Low Valence – Homosexual Intercourse Video Segment

Valence and Arousal

Respecting the valence and arousal ratings for the homosexual intercourse videos in experiment one, it was hypothesized that they would receive the lowest ratings on both scales. This was confirmed for the arousal however not always for the valence, as most of them were rated as low arousing but neutral in valence. Through these ratings we were able to determine which of these would be used in the second experiment of this thesis. Although the chosen video did not have the lowest ratings overall it was the only one to have been rated consistently low across both scales. In addition, it was also hypothesized that there would be no significant difference between the ratings obtained in experiment one and those from experiment two. This was confirmed with regards to the arousal ratings, but not so for the valence ratings. The valence ratings from the second study indicated that this video might have been more neutral in valence compared to the first. Upon inspection of the individual ratings, it was uncovered that a select number of participants found this video to have been both highly arousing and attractive, which would have pulled up the mean of the ratings. It was also found, through the demographic questionnaire, that these participants enjoyed watching male homosexual pornography, which could explain their arousal and valence ratings. In the future, it may be beneficial to consider these participants as their own category in order to remove their influence on the data.

Focusing on the second experiment alone, it was hypothesized that there would be no significant difference between male and female ratings. This was confirmed. However, both the arousal and valence ratings obtained from the second experiment overall for this video indicated that there was no statistically significantly difference with those obtained from the naked yoga video segment (i.e.: Neutral condition). This causes some concern, as this indicates that future responses, both subjective and objective, may be similar for both conditions. Thankfully this was not the case, as will be discussed further in the following sections.

SADI

With regards to the ratings obtained from the SADI, it was hypothesized that this video segment would receive the highest ratings in the negative component. This was confirmed, as this video segment was rated highest in the negative component. In addition, it received the second lowest ratings of the three videos for the evaluative, motivational, and physiological component. These ratings lead us to surmise that the homosexual intercourse video elicited higher levels of negative/aversive affect, with lower levels of cognitive-emotional appraisals of arousal and desire overall, as well as a decrease of general desire/motivation to engage in sexual activity and physical drive associated to one's sexual arousal and desire. In addition, we hypothesized that there would be no significant difference between men and women with regards to these ratings. This was also confirmed.

Although the valence and arousal ratings pointed towards the notion that this video segment may not have been the least preferred subjectively, the results obtained from the SADI provide a more in-depth look into how this video effects specific aspects of one's own arousal and desire. It is thus recommended that future studies validate this video through replication in order to determine how these ratings shift over the course of a series of experiments. This would be with the aim of concretizing the ratings associated to this video.

Eye Tracking and Eye Movement Variability

Moving to the eye movement data, it was hypothesized that the homosexual intercourse video would elicit the highest level of EMV compared to the other two videos. This was not the case. As discussed in the previous section, the eye movement data obtained for the heterosexual intercourse video segment had the highest amount of EMV. However, the homosexual intercourse video did maintain more EMV overall compared to the naked yoga video. When separating the data based on sex this effect went away, as both men and women's EMV for the homosexual intercourse video segment was not statistically significantly different from the naked yoga video. In addition, there was no difference between EMV between men and women for this video segment.

There are some possible explanations for this effect. The first consists of the way in which the video was filmed. Unlike the heterosexual intercourse video segment, the homosexual intercourse clip was film with a close-up shot. As such, there were fewer distractions surrounding the on-screen couple, offering fewer other objects for the participants to look at. Indeed, when looking at the eye movements qualitatively over the course of the video segment, we notice that participants focus on the actors face, chest, and pelvic area throughout the majority of the video itself. Eye movements become more scattered toward the end of the video, after the resolution or climax. As the present video was filmed at a medium-to-close up shot, this limited the amount to which participants could shift their attention to the surrounding aspects of the video. This brings us back to the IOR process discussed earlier when reviewing the results obtained for the heterosexual intercourse video segment. We could better see the actors in this video segment compared to the heterosexual intercourse clip, whose overall features were less defined due to the distance of the camera from the actors. This could have contributed to participants wanting to keep eye contact with the performance, as it was more salient than the surrounding stimuli.

Heart Rate Variability

Contrary to the connection between positive affect and HRV, the association between negative affect and HRV has been investigated for some time (Porges, 2003; Thayer et al., 2012; Beauchaine & Thayer, 2015). As previously argued, previous research seems to point at the notion that HRV is predictive of negative affect. More specifically however is not simply that

HRV as a whole is predictive of negative affect, but that a decrease in HRV is predictive of this emotional state. An increasing body of research interested in the mechanisms involved in this connection has determined that a decrease in HRV from baseline, when confronted with instances or stimuli that elicit negative emotions, indicates that individuals are allocating self-regulation resources in order to work through this emotional challenge (Beauchaine & Thayer, 2015). As a result, we hypothesized that the homosexual intercourse video segment would cause an overall decrease in HRV, as this video was subjectively rated as Low Arousal/Low Valence in the first study conducted for this thesis. This hypothesis was not confirmed as we did not see a significant decrease in HRV from baseline while participants where watching the homosexual intercourse video. We also correlated the subjective ratings obtained from the Valence and Arousal scales to the overall HRV, but found no significant correlations. This was also the case when we separated the data based on sex.

A critical analysis conducted by Rottenberg (2007) aimed at uncovering specifically which emotions are involved in the interplay between decreased HRV and self-regulatory mechanisms due to negative affect. He determined that there is suggestive evidence that depression may be linked to shifting levels of HRV, but that increasing numbers of studies are suggesting that anxiety may be the true culprit (Rottenberg, 2007). This line of thought provides a theoretical framework for explaining why this video segment caused a decrease in HRV. As previously discussed when examining the subjective data obtained through the SADI ratings, the homosexual intercourse video clip elicited strong negative emotions in the participants. Words from the SADI such as restrained, anxious, disturbed, and uninterested were commonly given higher ratings when participants were describing how they felt at the present moment after viewing this video clip. As such, we speculate that this video triggered feelings of anxiety and stress, prompting the participants to engage in emotional self-regulation. Future studies interested in the effect of negatively arousing and attractive sexual stimuli on HRV should include subjective measures aimed at describing how the stimuli makes them feel in order to expand on the previously proposed theory.

As with the heterosexual intercourse video segment, we also divided participants based on whether they had HF-HRV or LF-HRV at baseline in order to determine if these two categories of individuals when viewing the homosexual intercourse video segment. Results indicated that there was a significant difference between these two groups of people, whereby on average the HF-HRV had higher levels of HRV compared to the LF-HRV group. In addition, neither the HF-HRV nor the LF-HRV group significantly differed from their baseline levels. Given the previous research on this matter, we conclude that this video did cause any shifts in trait HRV. We also divided the Valence and Arousal ratings based on whether the participants fell under the HF-HRV or LF-HRV group and correlated the ratings to the heart rate data. These correlations were not significant.

Pupillometry

As with the heterosexual intercourse video segment, we analysed the pupillary data obtained from participants when viewing the homosexual intercourse video during the second experiment of this thesis. Results demonstrated that overall, the participants pupils were significantly more dilated when viewing this video segment compared to the heterosexual intercourse video. When then divided the data based on participant sex and, through qualitative assessments, we determined that the men's pupils were more dilated throughout the video as compared to women's. Interestingly, we notice the largest increase in pupil size at two distinct moments in the video segment for men. The first occurred when a close-up was done on the male actor being penetrated, and the second when the other main actor ejaculates on his partner. Although women's pupils were overall less dilated than the men's we also notice two distinct points in the video clip that caused an increase in pupil dilation. The first occurred just as one of the male actors ejaculates and the other toward the end of his ejaculation. As we can see, the moment of ejaculation caused an increase in pupil size for both sexes. Additionally, males' maintained overall larger pupils throughout the duration of the video segment in comparison to women. These results are comparable to the ones obtained from the heterosexual intercourse video, where one distinct moment in the video was associated to an increase in pupil dilation (i.e.: first penetration) and overall men maintained more dilated pupils than women.

Low Arousal/Neutral Valence – Naked Yoga Video Segment

Valence and Arousal Ratings

The final video of interest that will be discussed was the one that portrayed a young woman performing a naked yoga routine. This video was chosen as a sexually neutral condition, whereby the only sexual content present for this segment was the actresses' naked body. This was done in an attempt to have a neutral condition in the second experiment of this thesis, while still containing similar content as the two other video segments (i.e., a naked individual). In the first experiment of this thesis (Chapter 2), we presented participants with a set of sexually neutral videos, whereby the videos portrayed a variety of activities (e.g., Aerobics, Yoga) performed in the nude. We were aiming to find a video that was rated as Low Arousal/Neutral Valence, which led us to the one used in our second experiment. As such, it was first hypothesized that the ratings obtained in study one would not be significantly different than those obtained in study two. This was the case for the valence ratings, however not so for the arousal ratings as these were significantly higher than the ones obtained in the first study. As such, we can conclude that although the participants in did not seem to like this video more than those in the first study, it did appear to have increased their arousal. Additionally, we compared the ratings from women to those of the men in the second experiment in order to see if there were any differences in ratings. We found that men rated this video as both more arousing and appealing compared to women. This indicated that this video was in fact not neutral to the male participants in this study.

As a result of these last results, we can already conclude that, for men, when selecting a video for a neutral condition, it should not contain any nudity. In an attempt to use a video that does not deviate too far from those in the experimental conditions, future studies should test to see if a video of a couple holding hands would be more appropriate for this type of condition. Furthermore, it would also be interesting to compare a video such as the one previously described to one that is entirely neutral (e.g.: a nature video) in order to determine which category would be more effective in a study such as the second one conducted in this thesis.

SADI

With regards to the overall ratings obtained from the SADI ratings indicated that this video segment was in fact rated the lowest on ever component, with the exception of the negative component. As such, the aspects of sexual arousal and desire concerning cognitive, physiological and motivational of the participants were not stimulated when viewing this video. This falls in line with the overall valence and arousal ratings. We further compared the male and female responses and found that women rated this video more negatively than men. Comparatively, the male participants rated this clip higher on the evaluative, physiological, and motivational component. This reinforces the results obtained in the arousal and valence ratings. It is clear that subjectively, the naked female doing yoga in the video is not neutral for men. Shifting the focus to women, upon inspection of the arousal, valence, and SADI ratings, one could theorize that the women may have experienced a negative arousal when viewing this video. This may have been the case as previous research has demonstrated that women viewing other highly attractive women experience negative affect when they compared themselves to attractive female models (Bower, 2001; Martin & Gentry, 1997). As the actress on screen was a highly attractive playboy model, we theorize that the women of this study experienced negative feelings when viewing this video. As a result, we conclude that this video is also not a subjectively neutral video for women.

Eye Tracking and Eye Movement Variability

Regarding the EMV data, it was predicted that this video would be associated with higher levels of EMV overall, as well as for men and women separately. This was not the case. The data regarding the EMV overall indicated that this video had the least EMV compared to the other two. When separated the data based on sex, we notice that this video, along with the naked yoga video clip, had the least EMV for both men and women. However, when comparing men and women, we find that men experienced more EMV when viewing this video compared to women. This however does not remove from the fact that this video did not caused higher levels of EMV, especially compared to the heterosexual intercourse video segment. A first explanation of these results relate back to the way in which the video itself was filmed. Unlike the heterosexual intercourse video, many of the camera positions were medium to close-up shots. In addition, there were several instances during which the camera moved across the actresses' body, thereby guiding the participants' eye movements to a greater extent that would have been observed in a static shot. As such, the way in which the video was filmed may have been more visually interesting to the participants, as well as guided there attention through the camera movements. This would have been complimented by the participants' general affect, as this video was not truly neutral for either men or women, as discerned from the subjective ratings. As such, the combination of the video filming as well as the participants' affect may very well have been the culprit behind the lower EMV.

Heart Rate Variability

Much like for the heterosexual intercourse video segment, little to no research has been conducted to investigate the link between this type of video to HRV. As such, the inclusion of this measurement in the current thesis was done in an exploratory fashion. As a result, no singular hypothesis concerning the connection between HRV and the naked yoga video segment was put forward. Beginning with the overall data, we found that there was a significant decrease in HRV from baseline when viewing this video. When looking at the data based on whether participants fell under the HF-HRV group or LF-HRV group, we ascertained that participants in the HF-HRV had a significant decrease in HRV from baseline when viewing this video, but not so when for the LF-HRV group. From this data and previous research, we can conclude that viewing this video may have caused participants to engage in self-regulation, especially those in the HF-HRV group (Beauchaine & Thayer, 2015). This seems contrary to previous research, as individuals with HF-HRV at baseline as known to have better emotion regulation tendencies (Thayer et al., 2012). However, as no analyses concerning sex differences were conducted due to data loss, we cannot determine if perhaps the negative affect exhibited by the female participants, as determined through their subjective ratings, was not in fact the true reason behind this decrease in HRV. In this instance, the female data may be moderating this results obtained. As such, future research should investigate the effect of sex on this particular connection in order to get a more in-depth understanding of what may be going on.

Pupillometry

When looking at the overall data, we conclude that the participants' pupils were overall more dilated when compared to the heterosexual intercourse video segment, but were comparable to the data obtained from the homosexual intercourse video segment. Upon qualitative inspection of the graphs obtained to determine if there were any sex differences, we determined that men and women exhibited similar pupil sizes throughout the video. However, women experienced larger increases in pupil size when the actress on screen changed yoga positions, whereas men experienced a larger increase when the actress was most sexually exposed (i.e., breasts and vagina facing camera). These results further demonstrate that, for men, this video is not being considered neutrally arousing. One could only assume that this increase in pupil dilation at points in the video where the camera focused more on the actresses' breasts and vagina was caused by an increase in arousal in men. Contrarily, different yoga positions may have been more interesting and relevant for the women, possibly explained their pupillary responses. Additionally, these shots exposed the actresses' entire body and her form, perhaps giving the women an opportunity to compare themselves to the actress, increasing negative affect and causing an increase in pupil dilation. As these results are mildly convoluted, the recommendation for future research is to obtain more information regarding participant's overall impression of the video's presented, for example asking them to verbally describe their feelings while watching the video. This would be done in order to move away from conjecture, and toward a better understanding of how the video impacted the participants to better explain their objective responses.

Statistical Limitations

The use of images as stimuli provides notable advantages compared to video, as it removes several difficulties that one is confronted with when using video stimuli. The first of these is time. Specifically, image presentations are short, allowing for the presentation of multiple images to one participant while controlling for the quantity of data accumulated. To offer a comparison with regards to eye tracking, the number of data points accumulated when presenting an image for 5 secs equates to 5000 data points (at the 1000Hz sampling rate of the eye tracker used in this thesis), while the number accumulated when presenting a 3 min video falls at roughly 180,000 data points. The problem therefore lies in how to handle these data in order to conduct the appropriate analyses. Typically, experimenters will down sample data to the extent that it is easily manipulated. For an image, doing so will cause a loss of information about the participants' physiological response, but not with regards to anything that relates to the stimulus itself as it stays stable over time. This is not the case with a video, as down sampling the data will cause a loss of information for both the physiological response and with regards to what is taking place in the video, as it is not stable over time.

This leads to the second challenge to overcome when using video stimuli, which is the addition of another dimension: movement over time. As videos are not static, this little added bonus could cause changes in a participants' physiological response with each change of scene or even shift in actor position. As such, several aspects within the video could cause changes in the physiological response, making it difficult to hypothesize why a participants' responses will change over time. Yet in addition to the difficulties caused by the composition of the video itself, one must also consider the effect that human behaviour has on this problem as well. Notably, an inhibitory aftereffect that we experience in response to our visual called inhibition of return (IOR) adds to this dilemma. IOR refers to the mechanism in which humans have natural tendency to orient our attention toward novel stimuli (Klein, 2000). This creates what is called a saliency map, a map of items in our surroundings that standout enough to grab our attention (Henderson & Hayes, 2017). According to a new study conducted by Henderson and Hayes (2017), these saliency maps are in fact driven by the meaning of what attracts our attention. When looking at an image, the saliency map that we construct will remain stable over the time during which it is presented, as an image is static. However, when looking at a video, this saliency map is no longer stable as it not only changes as a function of the viewer, but also as a function of the video itself. This presents yet another set of difficulties that must be considered from an eye tracking perspective. Notably, several well-established metrics already exist in the context of an image, but not so for videos. For example, a fixation in visual science is defined as maintaining visual contact on a single location. These last between 150-600ms and make up about 90% of our global viewing time. When dealing with a static image, this definition can easily be applied, as none of the targets within the image are moving. For a video however, where most targets are moving, it becomes increasingly difficult to translate the metrics that have already been determined for images to videos.

With this in mind, it is no wonder that many significant results occur when using image stimuli. For example, the study conducted by Finke et al., (2017) found a correlation between pupillary changes and subjective ratings of valence and arousal. Indeed, the use of a correlation between physiological and subjective data is a useful global analysis of what is happening within the data on average. However, this form of analysis may not be sensitive enough to point out any such associations occurring within the video, for the reasons outlined above. As a matter of fact, the correlations conducted between the subjective and objective data (e.g., between valence ratings and EMV for the heterosexual intercourse video clip) were inconclusive. This hints towards the idea that average subjective ratings are not related to average physiological responses. When using video stimuli, it would be more effective to analyse what is happening within the video and not in terms of averages.

With this in mind, it would be instinctual to conduct and ANOVA in such cases, however this produces yet another problem; that of multiple comparisons. As such, it is suggested that statistical analyses such as temporal Exploratory Structural Equation Modelling (i.e., temporal ESEM) could be implemented. In temporal ESEM, the goal is to identify shared variance among responses from 1 indicator across multiple time points, consequently creating components to reflect specific patterns in the data. Such components could reflect a 10 second period in a video whereby the pupil response will be similar across one's sample. For example, the entire sample having pupil dilation during the 5-second orgasm segment.

Furthermore, traditional analyses such as an ANOVA may work well for objective measures pertaining to a photo due to the fact that all sources of variance are explained through one's experience of viewing the photo, as this is a stable stimulus. In a video, a significant correlation could be due to what the participant just saw, what they're seeing, or what they anticipate to see. As such, time specific correlations should be avoided when analyzing objective measures during videos. Temporal ESEM addresses this issue by including multiple time points to create components in which the shared variability of the objective measure reflects a "segment of film" rather than an isolated score at a particular point in the video.

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SUPPLIMENTAL MATERIAL

Appendix 1
Consent Forms, Demographics Questionnaire, Subjective Measures

INFORMATION AND CONSENT FORM

Study Title: Rating of Pornographic Video Clips - 3 Part Study
Researcher: Karine Elalouf, (kelalouf@hotmail.com. 514-848-2424 ext. 5019)

Faculty Supervisors:
Dr. Aaron Johnson, PhD. Psychology / CRIR (aaron.johnson@concordia.ca, Tel. 514-848-2424 ext. 2241).
Dr. James Pfaus, PhD. Psychology, CSBN (jim.pfaus@.concordia.ca, Tel. 514-848-2424 ext. 2189).
Source of funding for the study: NSERC.

You are being invited to participate in the research study mentioned above. This form provides information about what participating would mean. Please read it carefully before deciding if you want to participate or not. If there is anything you do not understand, or if you want more information, please ask the researcher.

A. PURPOSE
The purpose of this study is to have participants watch three sexually explicit pornographic video clips lasting between 2:00 – 3:00 minutes in length. The videos watched include: Heterosexual Intercourse, Homosexual Intercourse, Neutral Naked Activity. The researchers are looking to collect data from the following objective measures: Eye Tracking and Heart Rate Variability. In addition, participants will be asked to fill out the following subjective measures: the Concordia Sex Background Survey, the Sexual Arousal and Desire Inventory (SADI), a 9pt Arousal likert scale, a 9pt Valence likert scale. This is a three-part study, as such all participants will be asked to participate on three separate occasions.

B. PROCEDURES
I understand that I will be asked to fill in a questionnaire that asks questions about my background including my age, ethnicity and religious background, relationship status, sexual orientation, and questions about my current sexual activity (including type of sex, frequency of orgasm, sexual difficulties). I understand that I will be hooked up to an Eye Tracker and a Heart Rate monitor. I understand that, with each session, I will then see a short video clip with different levels of erotic content (i.e. individuals engaging in sexual intercourse, and engaging in felliatio and cunnilingus). I will then have to rate each video clip on three scales: Arousal (i.e. XXXXX), Valence (i.e. XXXXX), and the Sexual Arousal and Desire Inventory (SADI)

C. RISKS AND BENEFITS

Participation in this study has no personal benefits. There are no physical risks associated with participation in this experiment. Exclusion criteria include women that are pregnant, and individuals with endocrine problems. This research is not intended to benefit you personally.

D. CONFIDENTIALITY

We will gather the following information as part of this research: general demographic information, health history and sexual activity data.

We will not allow anyone to access the information, except people directly involved in conducting the research project. We will only use the information for the purposes of the research described in this form. The information gathered will be coded. That means that the information will be identified by a code. The researcher will have a list that links the code to your name. The data will be kept under lock and key for a period of 5 years, after which it will be destroyed. We intend to publish the results of the research. However, it will not be possible to identify you in the published results. We will destroy the information five years after the end of the study.

F. CONDITIONS OF PARTICIPATION

You do not have to participate in this research. It is purely your decision. If you do participate, you can stop at any time. You can also ask that the information you provided not be used, and your choice will be respected. You may put an end to your participation at any time. As a compensatory indemnity for participating in this research, you will receive 1 participant pool credit. If you withdraw before the end of the research, you will receive still receive your credits. There are no negative consequences for not participating, stopping in the middle, or asking us not to use your information.

G. PARTICIPANT'S DECLARATION

I have read and understood this form. I have had the chance to ask questions and any questions have been answered. I agree to participate in this research under the conditions described.

NAME (please print) ______________________________

SIGNATURE ______________________________

DATE ______________________________

If you have questions about the scientific or scholarly aspects of this research, please contact the researcher. Their contact information is on page 1. You may also contact their faculty supervisor. If you have concerns about ethical issues in this research, please contact the Manager, Research Ethics, Concordia University, 514.848.2424 ex. 7481 or oor.ethics@concordia.ca.

INFORMATION AND CONSENT FORM

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NAME (please print) ____

SIGNATURE ____

DATE ____

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PARTICIPANT INFORMATION

Please fill in this part of the questionnaire as accurately as you can. All information you provide will remain strictly confidential. Please use the choice that best describes your answer to each question.

8. What is your sex / gender?

- ☐ Male
- ☐ Female
- ☐ Other (please specify) _____

9. What is your age? _____ years old

10. What is your race or ethnic group?

- ☐ African American
- ☐ American Indian
- ☐ Asian
- ☐ Hispanic
- ☐ White
- ☐ Other (please specify) _____

11. What is the religion you were brought up in? (Choose one)

- ☐ Catholocism
- ☐ Protestanism
- ☐ Judaism
- ☐ Islam
- ☐ Hinduism
- ☐ Other (Please specify) _____
- ☐ No religion

12. How religious would you describe yourself? (Circle one)

1	2	3	4	5
very low or none at all	Low	Moderate	High	Very high

6. How many times each week do you watch erotic videos or view pornographic images?

☐ 0 ☐ 1-5 ☐ 6-10 ☐ 10-15 ☐15 or more

7. What type of erotica/pornography do you usually watch (select all that apply)?

___ soft core ___mature ___male homosexual

___ hard core ___heterosexual ___female homosexual

___ bondage/bdsm ___anal ___gang bang

___ threesome ___amateur ___hentai

___ female friendly ___point of view ___ bisexual

___ toys ___webcam ___ celebrity

fetish (Specify): ______________________

race specific: ______________________

Other (Specify): ______________________

If you are Male, please skip to Question 12.

8. **Are you taking some form of oral contraceptive (i.e., a birth control pill)?**
   ☐ Yes
   ☐ No

- If you are taking an oral ccontraceptive, please identify the contraceptive brand name.

9. **Are you currently using an alternative form of contraceptive (i.e., vaginal ring, diaphragm, intrauterine device, etc.)**
   ☐ Yes
   ☐ No

- If you are using an alternative form of contraceptive, please identify which one.

10. **Are you currently menstruating?**
    ☐ Yes.
    ☐ No. When was last day of your last menstrual cycle? (guess if not known)

    _____

11. a) What is your level of sexual arousal during the first two days of your period?

1 2 3 4
5
Very Low (N/A) Low Moderate High Very
High

b) What is your level of sexual arousal midway through your monthly cycle? (around ovulation?)

1 2 3 4
5
Very Low (N/A) Low Moderate High Very
High

12. What is your relationship status? (Tick all that apply)

- ☐ Single (skip to Question 10)
- ☐ Casual dating
- ☐ In a relationship / Exclusive dating
- ☐ Engaged
- ☐ Married / Common-law
- ☐ Widowed
- ☐ Divorced

13. Select the item that corresponds with the duration of the relationship

- ☐ Less than or equal to 1 month.
- ☐ Between 1 and 3 months.
- ☐ Between 3 and 6 months.
- ☐ Between 6 months and 1 year.
- ☐ Between 1 and 2 years.
- ☐ Between 2 and 4 years.
- ☐ Between 4 and 6 years.
- ☐ Between 6 and 10 years.
- ☐ Over 10 years.

14. What is your current sexual orientation? (Circle one)

0. Exclusively heterosexual
1. Predominantly heterosexual, only incidentally homosexual
2. Predominantly heterosexual, but more than incidentally homosexual
3. Equally heterosexual and homosexual
4. Predominantly homosexual, but more than incidentally heterosexual
5. Predominantly homosexual, only incidentally heterosexual
6. Exclusively homosexual

X – Asexual (i.e. no socio-sexual contacts or reactions)

15. On average how many times a week do you have sexual intercourse? (Tick one per type of sexual intercourse)

Anal:	☐ 0	☐ 1 - 4	☐ 5 - 8	☐ 9 or more
Genital (Penile-Vaginal):	☐ 0	☐ 1 - 4	☐ 5 - 8	☐ 9 or more
Oral:	☐ 0	☐ 1 - 4	☐ 5 - 8	☐ 9 or more

16. On average how many times a week do you engage in other forms of sex play (e.g., dildo, fingering, hand job) (Tick one)

☐ 0 ☐ 1 - 4 ☐ 5 - 8 ☐ 9 or more

17. On average how many times a week do you think about sex? (Tick one)

☐ 0 ☐ 1 - 5 ☐ 6 - 10 ☐ 10 – 15 ☐ 15 or more

18. Over the past 4 weeks, how would you rate your level (i.e., degree) of sexual desire or interest? (Circle one)

1	2	3	4	5
very low or none at all	Low	Moderate	High	Very high

19. When was the last time you engaged in sexual intercourse? ____________

20. Over the past 4 weeks, how often did you feel sexually aroused ("turned on") during sexual activity or intercourse? (Circle one)

0	1	2	3	4	5
No Sexual Activity	Almost never or never	A few times (less than ½ the time)	Sometimes (about ½ the time)	Most times (more than half the time)	Almost always or always

21. Over the past 4 weeks, when you had sexual stimulation or intercourse, how often did

you reach orgasm (i.e., climax / cum)? (Circle one)

0	1	2	3	4	5
No Sexual Activity	Almost never or never	A few times (less than ½ the time)	Sometimes (about ½ the time)	Most times (more than half the time)	Almost always or always

22. Recall to the best of your ability the most recent orgasm you experienced during sex <u>with a partner</u>. This would include any sexual activity with your partner in which you had orgasm while your partner was present.

To the best of your memory, how did you have this orgasm with your partner? (circle letter)

a. through intercourse (vaginal/anal/other) **b.** through oral stimulation from partner

c. through manual stimulation from partner **d.** through manual stimulation from myself

e. other (describe briefly on line, e.g., clitoral stimulation/vaginal intercourse at same time)

23. How many times a week do you masturbate?

☐ 0 ☐ 1 - 5 ☐ 6 - 10 ☐ 10 – 15 ☐ 15 or more

24. When was the last time you engaged in solitary masturbation? ______________

25. Please rate the intensity of your orgasm through masturbation.

0	1	2	3	4	5
Not intense			Moderate		Intense

26. Do you experience any difficulty engaging in sexual activity? (Circle one)

0	1	2	3	4	5
Never		Sometimes		Often	Always

If your answer to Question 17 was between 1 and 5, please answer Questions 18 and 19.

27. What was the cause of the difficulty engaging in sexual activity? (Tick all those that apply)

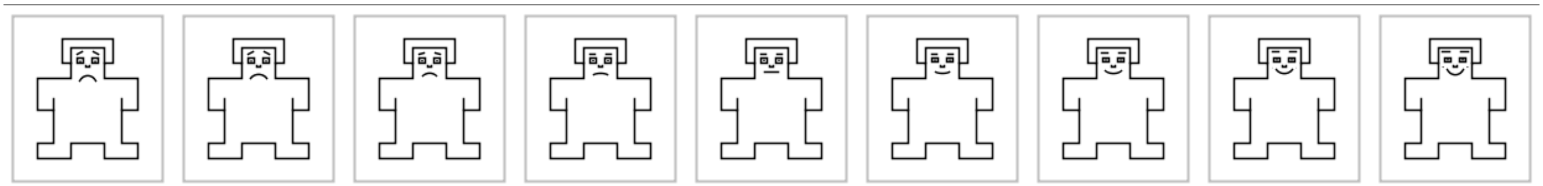
- ☐ Pain.
- ☐ Lack of erection or lubrication.
- ☐ Premature ejaculation.
- ☐ Lack of desire.
- ☐ Lack of orgasm.
- ☐ Lack of satisfaction.
- ☐ Other. Briefly describe: _____

28. Over the past 4 weeks, how often did you experience the difficulty? (Circle one)

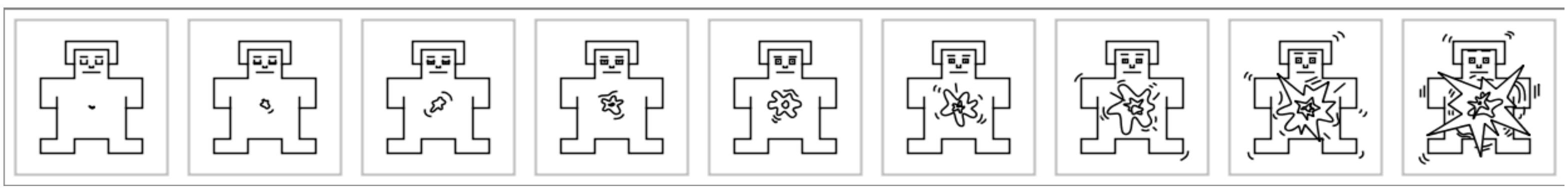
0	1	2	3	4	5
Did not attempt	Almost never	A few times	Sometimes	Most times	Almost
always					
intercourse	or never	(less than ½ the time)	(about ½ the time)	(more than half the time)	or always

Thank You

SAM Valence 9pt



SAM Arousal 9pt.



APPENDIX 2

Supplemental Material - Chapter 2

Table 2.1.
Descriptive Statistics

	Sex	*Age*	*Sexual Orientation*
Valid	148	148	148
Missing	0	0	0
Mean	1.182	22.43	0.8311
Median	1	22	0
Mode	1	21	0
Std. Deviation	0.4523	3.864	1.397
Range	3	36	6
Minimum	1	2	0
Maximum	4	38	6

Table 2.2.
Frequencies - Sexual Orientation

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	0	68	54.8	54.8	54.8
	1	38	30.6	30.6	85.5
	2	7	5.6	5.6	91.1
	3	7	5.6	5.6	96.8
	4	1	0.8	0.8	97.6
	6	3	2.4	2.4	100
	Total	124	100	100	

Table 2.3.

Descriptive Statistics - Arousal Ratings for Heterosexual Intercourse Video Segments

	Video 1	*Video 2*	*Video 3*	*Video 4*	*Video 5*	*Video 6*
Valid	22	22	22	22	22	22
Missing	0	0	0	0	0	0
Mean	4.272	5.227	5.227	5.863	5.636	3.59
Median	4.8	5.14	5.22	5.97	5.72	3.22
Mode	4.8	6.3	6.3	5.8	4.97	3.8
Std. Deviation	2.303	1.319	1.186	1.176	1.656	1.65
Skewness	-0.172	0.008147	-0.6393	-0.6353	-0.5254	1.01
SE of Skewness	0.491	0.491	0.491	0.491	0.491	0.491
Kurtosis	-0.8241	-0.7249	1.519	-0.09813	0.2177	0.599
SE of Kurtosis	0.9528	0.9528	0.9528	0.9528	0.9528	0.9528
Range	7.84	4.83	5.33	4.33	6.33	6.17
Minimum	0.3	3.14	1.97	3.14	1.97	1.3
Maximum	8.14	7.97	7.3	7.47	8.3	7.47

[a] More than one mode exists, only the first is reported

Table 2.4.
Descriptive Statistics - Valence Ratings for Heterosexual Intercourse Video Segments

	Video 1	*Video 2*	*Video 3*	*Video 4*	*Video 5*	*Video 6*
Valid	22	22	22	22	22	22
Missing	0	0	0	0	0	0
Mean	5.089	4.998	5.861	6.089	5.589	3.77
Median	4.82	5.15	5.485	6.23	5.485	3.485
Mode	7.23	3.23	4.4	6.23	3.73	3.4
Std. Deviation	2.583	1.635	1.362	1.498	1.793	1.812
Skewness	0.5838	-0.5289	0.5034	-0.1312	-0.1321	-0.2698
SE of Skewness	0.491	0.491	0.491	0.491	0.491	0.491
Kurtosis	-0.1007	-0.5009	-0.5753	-0.08499	-0.8074	0.8585
SE of Kurtosis	0.9528	0.9528	0.9528	0.9528	0.9528	0.9528
Range	9.83	6	5	5.66	6.5	8.17
Minimum	1.57	1.23	3.73	3.07	2.23	-0.77
Maximum	11.4	7.23	8.73	8.73	8.73	7.4

[a] More than one mode exists, only the first is reported

Table 2.5.

Descriptive Statistics - Arousal Ratings for Male-Male Intercourse Video Segments

	Video 1	*Video 2*	*Video 3*	*Video 4*	*Video 5*	*Video 6*
Valid	23	23	23	23	23	23
Missing	0	0	0	0	0	0
Mean	2.391	2.304	3.13	3.087	2.652	3.173
Median	2.62	2.46	2.96	3.12	2.46	3.12
Mode	0.29	2.62	2.62	4.62	2.12	2.62
Std. Deviation	1.434	1.144	1.386	1.143	1.046	1.3
Skewness	-0.106	0.285	-0.2337	-0.3901	0.1639	0.3667
SE of Skewness	0.4813	0.4813	0.4813	0.4813	0.4813	0.4813
Kurtosis	-0.9376	1.071	0.8235	-0.1098	-0.01041	1.26
SE of Kurtosis	0.9348	0.9348	0.9348	0.9348	0.9348	0.9348
Range	4.67	5	6	4.33	4.33	6.17
Minimum	0.29	0.29	-0.38	0.46	0.29	0.29
Maximum	4.96	5.29	5.62	4.79	4.62	6.46

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Table 2.6.
Descriptive Statistics - Valence Ratings for Male-Male Intercourse Video Segments

	Video 1	*Video 2*	*Video 3*	*Video 4*	*Video 5*	*Video 6*
Valid	23	23	23	23	23	23
Missing	0	0	0	0	0	0
Mean	2.435	2.87	3.043	2.87	2.522	3.043
Median	2.46	2.8	2.8	2.8	2.8	2.8
Mode	2.46	2.13	2.8	3.46	2.46	2.46
Std. Deviation	0.705	0.8927	1.048	0.8653	1.056	1.02
Skewness	-0.2787	-0.07483	0.4759	-0.01544	-0.7352	1.168
SE of Skewness	0.4813	0.4813	0.4813	0.4813	0.4813	0.4813
Kurtosis	-0.1782	-0.4025	-0.7128	-0.524	1.712	0.7443
SE of Kurtosis	0.9348	0.9348	0.9348	0.9348	0.9348	0.9348
Range	2.67	3.5	3.5	3.33	5	3.83
Minimum	1.13	0.96	1.63	1.3	-0.2	1.8
Maximum	3.8	4.46	5.13	4.63	4.8	5.63

[a] More than one mode exists, only the first is reported

Table 2.7.
Descriptive Statistics - Arousal Ratings for Nonsexual Naked Activity Video Segments

	Video 1	*Video 2*	*Video 3*	*Video 4*	*Video 5*
Valid	24	24	24	24	24
Missing	0	0	0	0	0
Mean	2.96	2.252	2.46	2.96	2.168
Median	2.56	2.16	2.36	2.56	2.16
Mode	2.56	1.56	3.56	2.56	2.56
Std. Deviation	0.9745	0.7575	1.052	0.8905	0.6255
Skewness	1.147	0.3343	-0.1008	0.519	0.3115
SE of Skewness	0.4723	0.4723	0.4723	0.4723	0.4723
Kurtosis	1.35	-0.8188	-0.3235	-0.234	0.1472
SE of Kurtosis	0.9178	0.9178	0.9178	0.9178	0.9178
Range	4.2	2.6	4	3.4	2.6
Minimum	1.36	0.96	0.36	1.56	0.96
Maximum	5.56	3.56	4.36	4.96	3.56

Table 2.8.
Descriptive Statistics - Valence Ratings for Nonsexual Naked Activity Video Segments

	Video 1	*Video 2*	*Video 3*	*Video 4*	*Video 5*
Valid	24	24	24	24	24
Missing	0	0	0	0	0
Mean	4.672	3.588	2.963	4.88	4.047
Median	4.83	3.73	3.03	4.53	3.83
Mode	5.03	3.83	2.03	4.43	3.43
Std. Deviation	1.048	0.8361	1.279	1.055	1.168
Skewness	-0.0712	-0.4282	0.2801	0.2922	0.1855
SE of Skewness	0.4723	0.4723	0.4723	0.4723	0.4723
Kurtosis	-0.2874	-0.5687	-0.7774	-1.293	-0.2771
SE of Kurtosis	0.9178	0.9178	0.9178	0.9178	0.9178
Range	4	3	4.6	3.2	4.6
Minimum	2.63	2.03	0.83	3.43	1.63
Maximum	6.63	5.03	5.43	6.63	6.23

[a] More than one mode exists, only the first is reported

Table 2.9.
Paired Samples T-Test - Video 4 vs. Video 6 Valence Ratings

			t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*95% Confidence Interval*	
									Lower	***Upper***
Video 4	vs.	Video 6	4.085	21	< .001	2.318	0.567	0.871	1.138	3.498

Note. Student's T-Test.

Table 2.1.0
Bayesian Paired Samples T-Test - Video 4 vs. Video 6 Valence Ratings

			BF_{10}	*error %*
Video 4	vs.	Video 6	62.45	6.738e -7

Table 2.1.1
Paired Samples T-Test - Video 4 vs. Video 6 Arousal Ratings

			t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*95% Confidence Interval*	
									Lower	***Upper***
Video 4	vs.	Video 6	4.876	21	< .001	2.273	0.466	1.04	1.303	3.242

Note. Student's T-Test.

Table 2.1.2.
Bayesian Paired Samples T-Test - Video 4 vs. Video 6 Arousal Ratings

			BF_{10}	*error %*
Video 4	vs.	Video 6	333.9	1.108e -8

Table 2.1.3.
Paired Samples T-Test - Video 6 vs. Video 2 Valence Ratings

			t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*95% Confidence Interval*	
									Lower	*Upper*
Video 6	vs.	Video 2	2.179	22	0.04	0.609	0.279	0.454	0.029	1.188

Note. Student's T-Test.

Table 2.1.4.
Bayesian Paired Samples T-Test - Video 6 vs. Video 2 Valence Ratings

			BF_{10}	*error %*
Video 6	vs.	Video 2	1.567	3.389e -5

Table 2.1.5.
Paired Samples T-Test - Video 6 vs. Video 2 Arousal Ratings

			t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*95% Confidence Interval*	
									Lower	*Upper*
Video 6	vs.	Video 2	1.95	22	0.064	0.87	0.446	0.407	-0.055	1.794

Note. Student's T-Test.

Table 2.1.6.
Bayesian Paired Samples T-Test - Video 6 vs. Video 2 Arousal Ratings

			BF_{10}	*error %*
Video 6	vs.	Video 2	1.089	8.595e -5

Table 2.1.7.
Paired Samples T-Test - Video 4 vs. Video 3 Valence Ratings

		t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*95% Confidence Interval*	
								Lower	*Upper*
Video 4 vs.	Video 3	4.918	23	< .001	1.917	0.39	1.004	1.11	2.723

Note. Student's T-Test.

Table 2.1.8.
Bayesian Paired Samples T-Test - Video 4 vs. Video 3 Valence Ratings

		BF_{10}	*error %*
Video 4 vs.	Video 3	447.6	1.206e -7

Table 2.1.9.
Paired Samples T-Test - Video 4 vs. Video 3 Arousal Ratings

		t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*95% Confidence Interval*	
								Lower	*Upper*
Video 4 vs.	Video 3	3.019	23	0.006	0.792	0.262	0.616	0.249	1.334

Note. Student's T-Test.

Table 2.2.0.
Bayesian Paired Samples T-Test - Video 4 vs. Video 3 Arousal Ratings

		BF_{10}	*error %*
Video 4 vs.	Video 3	7.34	2.677e -6

APPENDIX 3

Supplemental Material Chapter 3

Participant Demographics

Table 3.0.
Descriptive Statistics - Participants

	Sex	*Age*	*Sexual Orientation*
Valid	40	40	39
Missing	0	0	1
Mean	0.15	22.32	0.3333
Median	0	21	0
Mode	0	19	0
SD	0.3616	5.171	0.5298
Skewness	2.038	3.204	1.285
SE of Skewness	0.3738	0.3738	0.3782
Kurtosis	2.263	12.07	0.7462
SE of Kurtosis	0.7326	0.7326	0.741
Minimum	0	18	0
Maximum	1	46	2

SADI Data

Table 3.1.
Descriptive Statistics - SADI Evaluative Component

	Baseline	*HA/HV*	*LA/NV*	*LA/LV*
Valid	1106	999	999	1052
Missing	1	108	108	55
Mean	2.274	1.618	0.5475	0.7899
Median	2	1	0	0
Mode	0	0	0	0
Std. Deviation	1.742	1.561	0.9619	1.192
Skewness	-0.004578	0.5093	1.909	1.469
Std. Error of Skewness	0.07355	0.07738	0.07738	0.07541
Kurtosis	-1.351	-0.9837	3.266	1.323
Std. Error of Kurtosis	0.147	0.1546	0.1546	0.1507
Range	5	5	5	5
Minimum	0	0	0	0
Maximum	5	5	5	5

Table 3.2.
Descriptive Statistics – SADI Negative Component

	Baseline	*HA/HV*	*LA/NV*	*LA/LV*
Valid	678	627	629	679
Missing	1	52	50	0
Mean	0.4897	0.4402	0.4261	0.7378
Median	0	0	0	0
Mode	0	0	0	0
Std. Deviation	0.9719	0.9275	0.9935	1.223
Skewness	2.232	2.236	2.576	1.57
Std. Error of Skewness	0.09386	0.09759	0.09744	0.0938
Kurtosis	4.848	4.269	6.286	1.373
Std. Error of Kurtosis	0.1875	0.1949	0.1946	0.1873
Range	5	4	5	5
Minimum	0	0	0	0
Maximum	5	4	5	5

Table 3.3.
Descriptive Statistics – SADI Physiological Component

	Baseline	*HA/HV*	*LA/NV*	*LA/LV*
Valid	677	646	612	644
Missing	3	34	68	36
Mean	1.835	1.644	0.3938	0.6832
Median	2	1	0	0
Mode	0	0	0	0
Std. Deviation	1.709	1.57	0.7548	1.122
Skewness	0.3515	0.4643	2.232	1.741
SE of Skewness	0.09393	0.09615	0.09877	0.0963
Kurtosis	-1.276	-1.019	5.54	2.515
SE of Kurtosis	0.1876	0.192	0.1972	0.1923
Range	5	5	5	5
Minimum	0	0	0	0
Maximum	5	5	5	5

Table 3.4.
Descriptive Statistics – SADI Motivational Component

	Baseline	*HA/HV*	*LA/NV*	*LA/LV*
Valid	410	370	360	380
Missing	0	40	50	30
Mean	1.896	1.465	0.4194	0.6237
Median	2	1	0	0
Mode	0	0	0	0
Std. Deviation	1.73	1.537	0.8068	1.138
Skewness	0.3041	0.6515	2.36	1.801
SE of Skewness	0.1205	0.1268	0.1286	0.1252
Kurtosis	-1.307	-0.8226	6.395	2.236
SE of Kurtosis	0.2405	0.253	0.2564	0.2497
Range	5	5	5	5
Minimum	0	0	0	0
Maximum	5	5	5	5

Table 3.5.

SADI Descriptives for individual words by trial

		Baseline		HA/HV		LA/NV		LA/LV	
Category	**Words**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Evaluative	Driven	1.56	1.56	0.84	1.17	0.19	0.40	0.47	1.03
	Urge to satisfy	2.28	2.13	2.36	1.60	0.48	0.68	0.87	1.36
	Enthusiastic	2.16	1.57	1.64	1.58	1.05	1.32	1.00	1.27
	Wet/Hard	1.80	2.04	1.64	1.25	0.19	0.40	0.46	0.81
	Hot	1.72	1.57	1.67	1.74	0.48	0.75	1.15	1.32
	Tempted	1.80	1.55	2.00	1.50	0.33	0.66	0.65	1.26
	Passionate	2.24	1.74	1.58	1.69	0.48	0.87	0.65	1.13
	Fantasize about sex	2.20	1.38	2.42	1.72	0.95	1.24	1.27	1.61
	Sensual	1.68	1.55	1.71	1.60	0.62	1.24	0.92	1.09
	Breathe faster/pant	1.96	1.72	1.19	1.51	0.38	0.67	0.69	1.12
	Stimulated	1.84	1.75	2.25	1.42	0.48	0.60	1.12	1.31
	Forget about all else	1.04	1.72	0.75	1.26	0.00	0.00	0.62	1.27
	Sexy	1.80	1.58	1.54	1.50	0.81	1.17	0.88	1.07
	Quivering sensations	1.40	1.50	1.13	1.45	0.14	0.36	0.58	1.21
	Seductive	1.72	1.49	1.46	1.56	0.76	1.04	0.62	0.94
	Good	2.60	1.55	2.13	1.60	2.00	1.64	1.69	1.62
	Warm all over	1.52	1.66	1.84	1.77	0.71	0.96	0.96	1.08
	Excited	1.84	1.72	2.00	1.80	0.62	0.86	1.04	1.18
	Tingling in genital area	1.88	1.94	2.64	1.66	0.43	0.81	0.88	1.34
	Pleasure	1.96	1.95	1.36	1.38	0.43	0.81	0.76	1.18
	Heart beats faster	2.00	1.66	2.32	1.49	0.67	1.02	1.00	1.24
	Happy	3.08	1.47	1.97	1.60	1.57	1.69	1.45	1.57
	Attractive	2.04	1.70	1.32	1.49	1.00	1.22	0.76	1.05
	Powerful	1.40	1.47	0.97	1.40	0.67	1.11	0.42	0.95
	Naughty	1.64	1.68	1.78	1.60	0.57	0.98	0.82	1.33
	Alluring	1.25	1.39	0.89	1.43	0.29	0.72	0.43	0.95
	Horny	2.04	1.86	2.14	1.49	0.48	0.81	0.79	1.12
Negative	Restrained	0.71	0.93	1.00	1.21	0.38	0.94	0.76	1.22
	Anxious	1.32	1.46	1.11	1.35	0.32	0.75	0.89	1.16
	Frigid	0.44	0.82	0.46	0.84	0.16	0.47	0.63	0.94
	Sluggish	0.28	0.74	0.25	0.53	0.44	0.92	0.39	0.92
	Unhappy	0.24	0.52	0.25	0.61	0.24	0.66	0.76	1.13
	Resistant	0.68	1.22	0.46	0.93	0.44	0.92	0.84	1.24
	Frustrated	0.84	1.25	0.42	0.72	0.40	0.91	0.47	1.03
	Aversion	0.28	0.61	0.25	0.90	0.40	0.91	0.79	1.49
	Repressed	0.84	1.25	0.50	1.02	0.32	1.07	0.63	1.02
	Disturbed	0.28	0.68	0.21	0.51	0.12	0.44	1.08	1.42
	Displeasure	0.36	0.91	0.08	0.28	0.24	0.72	0.89	1.23
	Repulsion	0.24	0.60	0.21	0.59	0.12	0.44	0.58	1.11
	Insensible	0.48	1.05	0.33	0.92	0.56	1.29	0.53	1.08
	Unattractive	0.44	0.92	0.50	1.06	0.40	0.96	0.37	0.91

	Uninterested	0.68	1.49	0.81	1.22	1.97	1.80	2.32	1.73
	Angry	0.16	0.55	0.14	0.54	0.13	0.42	0.21	0.66
	Lethargic	0.25	0.60	0.24	0.79	0.13	0.34	0.32	0.66
Physiological	Tingly all over	1.20	1.53	1.82	1.67	0.25	0.62	0.42	1.03
	Sensitive to the touch	2.32	1.86	1.58	1.43	0.36	0.73	0.50	0.98
	Lustful	1.52	1.76	1.97	1.64	0.33	0.58	0.68	1.07
	Entranced	1.04	1.49	1.03	1.38	0.33	0.58	0.50	0.99
	Hot	1.72	1.57	1.76	1.69	0.48	0.75	0.97	1.32
	Fantasize about sex	2.20	1.38	2.41	1.72	0.95	1.24	1.13	1.61
	Flushed	0.96	1.43	1.14	1.11	0.48	0.68	1.12	1.27
	Breathe faster/pant	1.96	1.72	1.19	1.51	0.38	0.67	0.66	1.12
	Stimulated	1.88	1.81	2.05	1.37	0.48	0.60	0.87	1.31
	Tingling in gut	0.92	1.29	1.24	1.48	0.24	0.54	0.29	0.72
	Quivering sensations	1.40	1.50	1.14	1.38	0.14	0.36	0.39	1.21
	Genitals reddish	0.84	1.49	0.73	1.28	0.05	0.22	0.26	0.86
	Throbs in genital area	1.48	1.78	1.81	1.60	0.10	0.30	0.47	1.20
	Warm all over	1.52	1.66	1.76	1.65	0.71	0.96	0.76	1.08
	Excited	1.88	1.76	1.92	1.62	0.62	0.86	0.89	1.18
	Tingling in genital area	1.88	1.94	2.37	1.62	0.43	0.81	0.74	1.34
	Heart beats faster	2.00	1.66	2.32	1.49	0.67	1.02	1.16	1.33
Motivational	Anticipatory	1.76	1.36	1.71	1.51	0.50	1.01	0.58	1.18
	Driven	1.56	1.56	0.92	1.26	0.18	0.39	0.47	1.03
	Urge to satisfy	2.28	2.13	2.24	1.67	0.45	0.67	0.87	1.36
	Frustrated	0.84	1.25	0.42	0.72	0.27	0.55	0.45	1.03
	Lustful	1.52	1.76	2.08	1.61	0.32	0.57	0.68	1.07
	Tempted	1.80	1.55	2.00	1.50	0.32	0.65	0.47	1.08
	Impatient	0.92	1.08	0.50	1.06	0.45	1.14	0.68	1.19
	Naughty	1.64	1.68	1.71	1.60	0.55	0.96	0.82	1.33
	Alluring	1.25	1.39	0.92	1.50	0.27	0.70	0.42	0.95
	Horny	2.04	1.86	2.13	1.57	0.45	0.80	0.79	1.12

Table 3.6.
Within Subjects Effects ANOVA - Evaluative Component

	Sphericity Correction	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*	η^2
RM Factor 1	Greenhouse-Geisser	1595	2.588	616.351	285.9	< .001	0.223
Residual	Greenhouse-Geisser	5562	2579.75	2.156			

Note. Type III Sum of Squares
[a] Mauchly's test of Sphericity indicates that the assumption of Sphericity is violated (p < .05).

Table 3.7.
Post Hoc Comparisons - Evaluative Component

Comparisons		*Mean Difference*	*SE*	*t*	p_{bonf}	*Cohen's D*
Baseline	HA/HV	0.51	0.06	8.36	< .001	0.40
	LA/NV	1.58	0.06	25.93	< .001	1.23
	LA/LV	1.32	0.06	21.65	< .001	0.99
HA/HV	LA/NV	1.07	0.06	17.58	< .001	0.83
	LA/LV	0.81	0.06	13.30	< .001	0.60
LA/NV	LA/LV	-0.26	0.06	-4.28	< .001	0.22

Table 3.8.
Bayesian Repeated Measures ANOVA - Negative Component

Models	*P(M)*	*P(M|data)*	BF_M	BF_{10}	*error %*
Null model (incl. subject)	0.5	3.857e -166	3.857e -166	1	
RM Factor 1	0.5	1	2.593e +165	2.593e +165	0.9

Note. All models include subject.

Table 3.9.
Within Subjects Effects ANOVA - Negative Component

	Sphericity Correction	Sum of Squares	df	Mean Square	F	p	η²
RM Factor 1	Greenhouse-Geisser	30.66	2.904	10.559	10.08	< .001	0.016
Residual	Greenhouse-Geisser	1903.59	1817.934	1.047			

Note. Type III Sum of Squares
[a] Mauchly's test of sphericity indicates that the assumption of sphericity is violated (p < .05).

Table 3.1.0.
Post Hoc Comparisons - RM Factor 1

		Mean Difference	SE	t	p_{bonf}	Cohen's D
Baseline	HA/HV	0.06	0.06	1.07	1	0.06
	LA/NV	0.07	0.06	1.29	1	0.07
	LA/LV	-0.20	0.06	-3.56	0.002	0.18
HA/HV	LA/NV	0.01	0.06	0.22	1	0.01
	LA/LV	-0.26	0.06	-4.63	< .001	0.25
LA/NV	LA/LV	-0.28	0.06	-4.85	< .001	0.25

Table 3.1.1.
Bayesian Repeated Measures ANOVA - Negative Component

Models	P(M)	P(M|data)	BF_M	BF_{10}	error %
Null model (incl. subject)	0.5	3.741e -4	3.742e -4	1	
RM Factor 1	0.5	1	2672.391	2672.391	1.02

Note. All models include subject.

Table 3.1.2.
Within Subjects Effects ANOVA - Physiological Component

	Sphericity Correction	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*	*η²*
RM Factor 1	Greenhouse-Geisser	820.3	2.27	361.371	165.5	< .001	0.214
Residual	Greenhouse-Geisser	3017.7	1382.34	2.18			

Note. Type III Sum of Squares
[a] Mauchly's test of sphericity indicates that the assumption of sphericity is violated (p < .05).

Table 3.1.3.
Post Hoc Comparisons - Physiological Component

		Mean Difference	*SE*	*t*	p_{bonf}	*Cohen's D*
Baseline	HA/HV	0.03	0.07	0.47	1	0.11
	LA/NV	1.31	0.07	17.78	< .001	1.11
	LA/LV	1.01	0.07	13.66	< .001	0.79
HA/HV	LA/NV	1.27	0.07	17.31	< .001	1.01
	LA/LV	0.97	0.07	13.19	< .001	0.7
LA/NV	LA/LV	-0.30	0.07	-4.12	< .001	0.3

Table 3.1.4.
Bayesian Repeated Measures ANOVA - Physiological Component

Models	*P(M)*	*P(M|data)*	BF_M	BF_{10}	*error %*
Null model (incl. subject)	0.5	6.087e -95	6.087e -95	1	
RM Factor 1	0.5	1	1.643e +94	1.643e +94	1.724

Note. All models include subject.

Table 3.1.5.
Within Subjects Effects ANOVA - Motivational Component

	Sphericity Correction	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*	*η²*
RM Fator 1	Greenhouse-Geisser	471.3	2.58	182.80	92.63	< .001	0.205
Residual	Greenhouse-Geisser	1826.8	925.69	1.97			

Note. Type III Sum of Squares
[a] Mauchly's test of sphericity indicates that the assumption of sphericity is violated (p < .05).

Table 3.1.6.
Post Hoc Comparisons - Motivational Component

		Mean Difference	SE	t	p_{bonf}	Cohen's D
Baseline	HA/HV	0.35	0.10	3.61	0.002	0.22
	LA/NV	1.39	0.10	14.29	< .001	1.04
	LA/LV	1.18	0.10	12.14	< .001	0.81
HA/HV	LA/NV	1.04	0.10	10.67	< .001	0.85
	LA/LV	0.83	0.10	8.53	< .001	0.61
LA/NV	LA/LV	-0.21	0.10	-2.15	0.193	0.21

Table 3.1.7.
Bayesian Repeated Measures ANOVA - Motivational Component

Models	P(M)	P(M|data)	BF_M	BF_{10}	error %
Null model (incl. subject)	0.5	4.016e -53	4.016e -53	1	
RM Factor 1	0.5	1	2.490e +52	2.490e +52	0.595

Note. All models include subject.

Table 3.1.8.
Independent Samples T-Test - Sex difference in ratings for the Evaluative Component

	t	df	p	Mean Difference	SE Difference	Cohen's d	95% Confidence Interval	
							Lower	Upper
Baseline	0.783	1078	0.434	0.115	0.133	0.067	-0.174	0.404
High Arousal/ High Valence	0	1722	1	0	0.077	0	-0.152	0.152
High Arousal/ Neutral Valence	-6.949	970	<.001	-0.611	0.098	1.644	-0.0784	-0.438
Low Arousal/Low Valence	0.263	1024	0.793	0.027	0.092	0.022	-0.173	0.226

Note. Student's T-Test.

[a] Levene's test is significant (p < .05), suggesting a violation of the equal variance assumption

Table 3.1.9.
Bayesian Independent Samples T-Test Sex difference in ratings for the Evaluative Component

	BF_{10}	error %
Baseline	0.128	4.600e -6
High Arousal/ High Valence	0.054	5.139e -4
High Arousal/ Neutral Valence	1.008e +9	3.562e -17
Low Arousal/Low Valence	0.099	5.582e -6

Table 3.2.0.
Independent Samples T-Test - Sex difference in ratings for the Negative Component

							95% Confidence Interval	
	t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*Lower*	*Upper*
Baseline	2.674	678	0.008	0.277	0.117	0.287	0.074	0.481
High Arousal/ High Valence	1.801	644	0.072	0.178	0.102	0.194	-0.016	0.372
High Arousal/ Neutral Valence	-2.362	610	0.019	-0.276	0.081	-0.276	-0.506	-0.047
Low Arousal/Low Valence	-0.344	661	0.731	-0.045	0.133	-0.037	-0.302	0.212

[a] Levene's test is significant ($p < .05$), suggesting a violation of the equal variance assumption

Table 3.2.1.
Bayesian Independent Samples T-Test Sex difference in ratings for the Negative Component

	BF_{10}	error %
Baseline	3.632	2.776e -8
High arousal/ High Valence	0.564	1.768e -7
High Arousal/ Neutral Valence	1.824	2.209e -8
Low Arousal/Low Valence	0.126	8.633e -7

Table 3.2.2.

Independent Samples T-Test - Sex difference in ratings for the Physiological Component

							95% Confidence Interval	
	t	***df***	***p***	***Mean Difference***	***SE Difference***	***Cohen's d***	***Lower***	***Upper***
Baseline	-1.943	678	0.052	-0.355	0.168	-0.209	-0.715	0.004
High Arousal/ High Valence	-2.853	644	0.004	-0.48	0.135	-0.308	-0.811	-0.15
High Arousal/ Neutral Valence	4.671	627	< .001	0.427	0.108	0.545	0.247	0.606
Low Arousal/Low Valence	-2.011	644	0.045	-0.243	0.098	-0.217	-0.479	-0.006

[a] Levene's test is significant (p < .05), suggesting a violation of the equal variance assumption

Table 3.2.3.

Bayesian Independent Samples T-Test Sex difference in ratings for the Physiological Component

	BF_{10}	*error %*
Baseline	0.725	1.492e -7
High Arousal/ High Valence	5.827	1.504e -8
High Arousal/ Neutral Valence	3847	2.014e -11
Low Arousal/Low Valence	0.826	1.187e -7

Table 3.2.4.

Independent Samples T-Test - Sex difference in ratings for the Motivational Component

							95% Confidence Interval	
	t	***df***	***p***	***Mean Difference***	***SE Difference***	***Cohen's d***	***Lower***	***Upper***
Baseline	-0.879	398	0.38	-0.213	0.216	-0.123	-0.689	0.263
High Arousal/High Valence	-1.019	368	0.309	-0.221	0.181	-0.144	-0.647	0.205
Low Arousal/Neutral Valence	-3.063	358	0.002	-0.372	0.119	-0.467	-0.611	-0.133
Low Arousal/Low Valence	0.422	378	0.673	0.068	0.148	0.059	-0.248	0.383

[a] Levene's test is significant (p < .05), suggesting a violation of the equal variance assumption

Table 3.2.5.

Bayesian Independent Samples T-Test Sex difference in ratings for the Motivational Component

	BF_{10}	**error %**
Baseline	0.219	4.911e -9
High Arousal/High Valence	0.249	1.689e -8
Low Arousal/Neutral Valence	12.48	2.511e -9
Low Arousal/Low Valence	0.166	9.582e -9

Valence and Arousal Ratings

Table 3.2.6.
Independent Samples T-Test - Study 1 and 2 Comparison Arousal Ratings

	t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*95% Confidence Interval*	
							Lower	*Upper*
High Arousal/High Valence	-1.401	55	0.167	-0.781	0.566	-0.376	-1.898	0.336
Low Arousal/Low Valence	-0.831	55	0.409	-0.443	0.541	-0.223	-1.512	0.625
Low Arousal/Neutral Valence	-2.854	57	0.006	-1.084	0.398	-0.748	-1.845	-0.323

Table 3.2.7.
Bayesian Independent Samples T-Test - Study 1 and 2 Comparison Arousal Ratings

	BF_{10}	*error %*
High Arousal/High Valence	0.61	1.465e -4
Low Arousal/Low Valence	0.361	1.006e -4
Low Arousal/Neutral Valence	7.095	1.262e -7

Table 3.2.8.
Independent Samples T-Test - Study 1 and 2 Comparison Valence Ratings

	t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*95% Confidence Interval*	
							Lower	*Upper*
High Arousal/High Valence	-0.719	55	0.475	-0.385	0.551	-0.193	-1.46	0.689
Low Arousal/Low Valence	2.072	55	0.043	1.098	0.503	0.556	0.036	2.161
Low Arousal/Neutral Valence	-1.295	57	0.2	-0.673	0.531	-0.34	-1.714	0.368

Table 3.2.9.
Bayesian Independent Samples T-Test - Study 1 and 2 Comparison Valence Ratings

	BF_{10}	*error %*
High Arousal/High Valence	0.336	9.632e -5
Low Arousal/Low Valence	1.565	3.230e -5
Low Arousal/Neutral Valence	0.535	9.412e -5

Table 3.3.0.
Within Subjects Effects ANOVA - Arousal ratings across video type

	Sum of Squares	*df*	*Mean Square*	*F*	*p*	*η²*
RM Factor 1	194.4	2	97.192	46.02	< .001	0.548
Residual	160.5	76	2.112			

Note. Type III Sum of Squares

Table 3.3.1.
Post Hoc Comparisons - Arousal ratings across video type

		Mean Difference	*SE*	*t*	*p bonf*	*Cohen's d*
HA/HV	LA/LV	2.468	0.329	7.498	< .001	1.345
	LA/NV	2.939	0.329	8.932	< .001	1.787
LA/LV	LA/NV	0.472	0.329	1.434	0.467	0.294

Table 3.3.2.
Bayesian Within Subject ANOVA - Arousal ratings across video type

Models	*P(M)*	*P(M|data)*	*BF M*	*BF 10*	*error %*
Null model (incl. subject)	0.5	1.084e -12	1.084e -12	1	
RM Factor 1	0.5	1	9.225e +11	9.225e +11	0.838

Note. All models include subjects

Table 3.3.3.
Within Subjects Effects ANOVA - Valence ratings across video type

	Sum of Squares	*df*	*Mean Square*	*F*	*p*	*η²*
RM Factor 1	68.06	2	34.03	12.42	< .001	0.246
Residual	208.22	76	2.74			

Note. Type III Sum of Squares

Table 3.3.4.
Post Hoc Comparisons - Valence ratings across video type

		Mean Difference	SE	t	p_{bonf}	Cohen's d
HA/HV	LA/LV	1.768	0.375	4.718	< .001	0.903
	LA/NV	1.406	0.375	3.751	0.001	0.785
LA/LV	LA/NV	-0.363	0.375	-0.967	1	0.179

Table 3.3.5.
Bayesian Within Subject ANOVA - Valence ratings across video type

Models	P(M)	P(M|data)	BF_M	BF_{10}
Null model (incl. subject)	0.5	6.505e -4	6.509e -4	1
RM Factor 1	0.5	0.999	1536.261	1536.261

Note. All models include subject.

Table 3.3.6.
Within Subjects ANOVA - Women Arousal Ratings across all Videos

	Sum of Squares	df	Mean Square	F	p	η²
RM Factor 1	180.9	2	90.458	41.48	< .001	0.564
Residual	139.6	64	2.181			

Note. Type III Sum of Squares

Table 3.3.7.
Post Hoc Comparisons - Women Arousal Ratings across all Videos

		Mean Difference	SE	t	p_{bonf}	d
HA/HV	LA/LV	2.37	0.364	6.52	< .001	1.211
	LA/NV	3.188	0.364	8.767	< .001	1.951
LA/LV	LA/NV	0.817	0.364	2.248	0.084	0.518

Table 3.3.8.
Bayesian Repeated Measures ANOVA - Women Arousal Ratings across all Videos

Models	*P(M)*	*P(M|data)*	BF_M	BF_{10}	*error %*
Null model (incl. subject)	0.5	3.480e -11	3.480e -11	1	
RM Factor 1	0.5	1	2.873e +10	2.873e +10	0.655

Note. All models include subject.

Table 3.3.9.
Within Subjects ANOVA - Women Valence Ratings across all Videos

	Sum of Squares	*df*	*Mean Square*	*F*	*p*	η^2
RM Factor 1	62.94	2	31.472	11.21	< .001	0.259
Residual	179.76	64	2.809			

Note. Type III Sum of Squares

Table 3.4.0.
Post Hoc Comparisons - Women Valence Ratings across all Videos

		Mean Difference	*SE*	*t*	p_{bonf}	*d*
Level 1	Level 2	-1.725	0.413	-4.18	< .001	0.85
	Level 3	-0.068	0.413	-0.165	1	0.907
Level 2	Level 3	1.656	0.413	4.015	< .001	0.034

Table 3.4.1.
Bayesian Repeated Measures ANOVA - Women Valence Ratings across all Videos

Models	*P(M)*	*P(M|data)*	BF_M	BF_{10}	*error %*
Null model (incl. subject)	0.5	0.002	0.002	1	
RM Factor 1	0.5	0.998	532.962	532.962	0.583

Note. All models include subject.

Table 3.4.2.

Within Subjects ANOVA - Men Arousal Ratings across all Videos

	Sum of Squares	*df*	*Mean Square*	*F*	*p*	*η²*
RM Factor 1	27.098	2	13.549	24.32	< .001	0.829
Residual	5.571	10	0.557			

Note. Type III Sum of Squares

Table 3.4.3.
Post Hoc Comparisons - Men Arousal Ratings across all Videos

		Mean Difference	*SE*	*t*	p_{bonf}	*d*
HA/HV	LA/LV	3	0.431	6.962	< .001	2.669
	LA/NV	1.343	0.431	3.117	0.033	0.995
LA/LV	LA/NV	-1.657	0.431	-3.844	0.01	1.218

Table 3.4.4.
Bayesian Repeated Measures ANOVA - Men Arousal Ratings across all Videos

Models	*P(M)*	*P(M|data)*	BF_M	BF_{10}	*error %*
Null model (incl. subject)	0.5	0.004	0.004	1	
RM Factor 1	0.5	0.996	263.272	263.272	0.759

Note. All models include subject.

Table 3.4.5.
Within Subjects ANOVA - Men Valence Ratings across all Videos

	Sum of Squares	*df*	*Mean Square*	*F*	*p*	*η²*
RM Factor 1	18.42	2	9.209	6.185	0.018	0.553
Residual	14.89	10	1.489			

Note. Type III Sum of Squares

Table 3.4.6.
Post Hoc Comparisons - Men Valence Ratings across all Videos

		Mean Difference	*SE*	*t*	p_{bonf}	*d*
HA/HV	LA/LV	2	0.704	2.839	0.053	1.325
	LA/NV	-0.267	0.704	-0.379	1	0.534
LA/LV	LA/NV	-2.267	0.704	-3.217	0.028	1.509

Table 3.4.7.
Bayesian Repeated Measures ANOVA - Men Valence Ratings across all Videos

Models	*P(M)*	*P(M|data)*	BF_M	BF_{10}	*error %*
Null model (incl. subject)	0.5	0.104	0.116	1	
RM Factor 1	0.5	0.896	8.615	8.615	0.405

Table 3.4.8.
Independent Samples T-Test - Arousal Ratings between Men and Women

					95% Confidence Interval	
Condition	*t*	*df*	*p*	*Cohen's d*	*Lower*	*Upper*
High Arousal/High Valence	-0.135	37	0.893	-0.06	-1.831	1.602
Low Arousal/Low Valence	0.64	37	0.526	0.284	-1.115	2.145
Low Arousal/Neutral Valence	-3.621	37	< .001	-1.607	-3.055	-0.863

Table 3.4.8. Independent samples t-test to compare male and female ratings for arousal ratings across all three video types.

Table 3.4.9.
Bayesian Independent Samples T-Test - Arousal Ratings between Men and Women

Condition	BF_{10}	*error %*
High Arousal/High Valence	0.398	4.120e -8
Low Arousal/Low Valence	0.456	5.097e -7
Low Arousal/Neutral Valence	30.84	9.892e -8

Table 3.5.0.
Independent Samples T-Test - Valence Ratings between Men and Women

					95% Confidence Interval	
Conditions	***t***	***df***	***p***	***Cohen's d***	***Lower***	***Upper***
High Arousal/High Valence	-0.558	37	0.58	-0.248	-1.978	1.124
Low Arousal/Low Valence	-0.156	37	0.877	-0.069	-2.125	1.822
Low Arousal/Neutral Valence	-3.111	37	0.004	-1.381	-3.881	-0.819

Table 3.5.1.
Bayesian Independent Samples T-Test - Valence Ratings between Men and Women

	BF_{10}	***error %***
High Arousal/High Valence	0.441	8.608e -7
Low Arousal/Low Valence	0.399	3.349e -8
Low Arousal/Neutral Valence	10.37	3.141e -6

Heart Rate Variability Data

Table 3.5.2.
Summary of EM Correlations between Original and Imputed Variables

	Baseline	*LA/NV*	*LA/LV*	*HA/HV*
Baseline	1			
LA/NV	0.454	1		
LA/LV	0.572	0.7	1	
HA/HV	0.568	5.13	0.525	1

Table 3.5.3.
Descriptive Statistics - Heart Rate Data Not Imputed

	Baseline	*HA/HV*	*LA/LV*	*LA/NV*
Valid	37	29	31	32
Missing	0	8	6	5
Mean	66.56	60.6	60.16	57.17
Std. Error of Mean	3.45	3.452	4.114	3.478
Median	61.16	58.79	53.71	53.57
Mode	29.59	31.76	35.87	28.67
Std. Deviation	20.98	18.59	22.91	19.67
Skewness	1.191	0.4225	2.297	0.9191
Std. Error of Skewness	0.3876	0.4335	0.4205	0.4145
Kurtosis	1.967	-0.8371	7.559	0.1163
Std. Error of Kurtosis	0.7587	0.8452	0.8208	0.8094
Minimum	29.59	31.76	35.87	28.67
Maximum	132.5	96.86	151.4	102.9

[a] More than one mode exists, only the first is reported

Table 3.5.4.
Descriptive Statistics - Heart Rate Data Imputated

	Baseline	*HA/HV*	*LA/LV*	*LA/NV*
Valid	41	41	41	41
Missing	2	2	2	2
Mean	66.69	61.72	63.24	57.3
Std. Error of Mean	3.187	2.964	3.611	2.885
Median	61.82	58.86	61.51	53.98
Mode	29.59	54.09	32.52	40.86
Std. Deviation	20.41	18.98	23.12	18.47
Skewness	1.136	0.7987	1.632	0.8386
Std. Error of Skewness	0.3695	0.3695	0.3695	0.3695
Kurtosis	1.952	0.1839	4.168	0.172
Std. Error of Kurtosis	0.7245	0.7245	0.7245	0.7245
Minimum	29.59	31.76	32.52	28.67
Maximum	132.5	112.7	151.4	102.9

[a] More than one mode exists, only the first is reported

Table 3.5.5.
Repeated Measures ANOVA - Within Subjects Effects
Overall HRV

	Sum of Squares	*df*	*Mean Square*	*F*	*p*
RM Factor 1	1865	3	621.7	3.798	0.012
Residual	19645	120	163.7		

Note. Type III Sum of Squares

Table 3.5.6.
Post Hoc Comparisons - Overall HRV

		Mean Difference	*SE*	*t*	p_{bonf}
Baseline	LA/NV	4.972	2.826	1.759	0.486
	LA/LV	3.447	2.826	1.22	1
	HA/HV	9.39	2.826	3.323	0.007
LA/NV	LA/LV	-1.525	2.826	-0.54	1
	HA/HV	4.419	2.826	1.564	0.723
LA/LV	HA/HV	5.944	2.826	2.103	0.225

Table 3.5.7.
Bayesian Repeated Measures ANOVA- Model Comparison Overall HRV

Models	*P(M)*	*P(M|data)*	*BF_M*	*BF_{10}*	*error %*
Null model (incl. subject)	0.5	0.27	0.369	1	
RM Factor 1	0.5	0.73	2.71	2.71	0.466

Note. All models include subject.

Table 3.5.8.
Independent Samples T-Test - Comparing HF-HRV and LF-HRV at Baseline

							95% Confidence Interval	
	t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*Lower*	*Upper*
Baseline_HL	-6.746	39	< .001	-29.59	4.314	-2.108	-38.46	-20.72

[a] Levene's test is significant (p < .05), suggesting a violation of the equal variance assumption

Table 3.5.9.
Bayesian Independent Samples T-Test - Comparing HF-HRV and LF-HRV at Baseline

	BF_{10}	*error %*
Baseline_HL	200224	7.658e -13

Table 3.6.0.
Independent Samples T-Test - Comparing HF-HRV and LF-HRV at HA/HV video condition

							95% Confidence Interval	
	t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*Lower*	*Upper*
HA/HV_HL	-2.196	39	0.034	-12.44	5.627	-0.686	-23.9	-0.982

Table 3.6.1.
Bayesian Independent Samples T-Test - Comparing HF-HRV and LF-HRV at HA/HV video condition

	BF_{10}	*error %*
HA/HV_HL	1.975	4.194e -5

Table 3.6.2.
Independent Samples T-Test - Comparing HF-HRV and LF-HRV at LA/LV video condition

							95% Confidence Interval	
	t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*Lower*	*Upper*
LA/LV_HL	-3.592	39	< .001	-22.78	6.245	-1.122	-35.6	-9.951

[a] Levene's test is significant ($p < .05$), suggesting a violation of the equal variance assumption

Table 3.6.3.
Bayesian Independent Samples T-Test - Comparing HF-HRV and LF-HRV at LA/LV video condition

	BF_{10}	*error %*
LA/LV_HL	33.78	3.856e -10

Table 3.6.4.
Independent Samples T-Test - Comparing HF-HRV and LF-HRV at LA/NV video condition

							95% Confidence Interval	
	t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*	*Lower*	*Upper*
LA/NV_HL	-4.66	39	< .001	-21.83	4.622	-1.456	-31.3	-12.35

[a] Levene's test is significant ($p < .05$), suggesting a violation of the equal variance assumption

Table 3.6.5.
Bayesian Independent Samples T-Test - Comparing HF-HRV and LF-HRV at LA/LV video condition

	BF_{10}	*error %*
LA/NV_HL	519.1	3.406e-9

Table 3.6.6.
Repeated Measures ANOVA - Within Subjects Effects HF-HRV

	Sum of Squares	*df*	*Mean Square*	*F*	*p*	η^2
RM Factor 1	2529	3	842.8	3.676	0.017	0.155
Residual	13758	60	229.3			

Note. Type III Sum of Squares

Table 3.6.7.
Post Hoc Comparisons - HF-HRV

		Mean Difference	*SE*	*t*	p_{bonf}	*d*
Baseline	HA/HV	13.338	4.561	2.854	0.050	0.638
	LA/LV	6.77	5.180	1.307	1.000	0.306
	LA/NV	13.178	4.744	2.778	0.070	0.606
HA/HV	LA/LV	-6.568	3.251	-2.020	0.342	-.441
	LA/NV	-0.160	4.448	-0.036	1.000	-0.008
LA/LV	LA/NV	6.408	5.526	1.160	1.000	0.253

Table 3.6.8.
Bayesian Repeated Measures ANOVA- Model Comparison HF-HRV

Models	*P(M)*	*P(M|data)*	BF_M	BF_{10}	*error %*
Null model (incl. subject)	0.5	0.255	0.343	1.000	
RM Factor 1	0.5	0.745	2.917	2.917	0.375

Note. All models include subject.

Table 3.6.9.
Repeated Measures ANOVA - Within Subjects Effects LF-HRV

	Sum of Squares	*df*	*Mean Square*	*F*	*p*	η^2
RM Factor 1	864.8	3	288.27	3.769	0.015	0.166
Residual	4359.1	57	76.48			

Note. Type III Sum of Squares

Table 3.7.0.
Post Hoc Comparisons - LF-HRV

		Mean Difference	*SE*	*t*	p_{bonf}	*d*
Baseline	HA/HV	-3.813	3.163	-1.206	1	-0.270
	LA/LV	-0.044	2.969	-0.015	1	-0.003
	NA/LV	5.413	2.246	2.411	0.157	0.539
HA/HV	LA/LV	3.769	2.711	1.391	1	0.311
	LA/NV	9.226	2.766	3.335	0.021	0.746
LA/LV	LA/NV	5.457	2.650	2.059	0.321	0.460

Table 3.7.1.
Bayesian Repeated Measures ANOVA- Model Comparison LF-HRV

Models	*P(M)*	*P(M|data)*	BF_M	BF_{10}	*error %*
Null model (incl. subject)	0.5	0.236	0.309	1	
RM Factor 1	0.5	0.764	3.231	3.255	0.566

Note. All models include subject.

Eye Movement Variability Data

Table 3.7.2.
Descriptive Statistics - Overall per Video

	HA/HV	*LA/LV*	*LA/NV*
Valid	404	194	390
Missing	0	210	14
Mean	3.70E+04	2.53E+04	2.34E+04
Median	3.64E+04	2.34E+04	2.23E+04
Mode	1.61E+04	7401	2.07E+04
Std. Deviation	9976	1.36E+04	1.01E+04
Skewness	0.4978	1.061	1.421
SE of Skewness	0.1214	0.1745	0.1236
Kurtosis	0.516	1.305	2.858
SE of Kurtosis	0.2422	0.3473	0.2465
Range	5.66E+04	7.13E+04	5.82E+04
Minimum	1.61E+04	7401	7343
Maximum	7.26E+04	7.88E+04	6.56E+04

[a] More than one mode exists, only the first is reported

Table 3.7.3.

Descriptive Statistics - EMV for Men and Women per Video

	HA/HV_Female	*HA/HV_Male*	*LA/LV_Female*	*LA/LV_Male*	*LA/NV_Female*	*LA/NV_Male*
Valid	202	202	97	97	195	195
Missing	0	0	105	105	7	7
Mean	3.16E+04	4.23E+04	2.37E+04	2.70E+04	2.06E+04	2.62E+04
Median	3.17E+04	4.22E+04	2.37E+04	2.32E+04	2.02E+04	2.37E+04
Mode	1.61E+04	2.38E+04	7401	8262	2.07E+04	9793
Std. Deviation	7465	9283	9482	1.66E+04	6393	1.22E+04
Skewness	0.3753	0.4321	-0.1008	0.9912	-0.06186	1.14
SE of Skewness	0.1711	0.1711	0.245	0.245	0.1741	0.1741
Kurtosis	1.668	0.4141	-1.423	0.2616	-1.373	1.003
SE of Kurtosis	0.3405	0.3405	0.4853	0.4853	0.3465	0.3465
Range	5.14E+04	4.88E+04	3.01E+04	7.05E+04	2.32E+04	5.58E+04
Minimum	1.61E+04	2.38E+04	7401	8262	7343	9793
Maximum	6.75E+04	7.26E+04	3.75E+04	7.88E+04	3.06E+04	6.56E+04

[a] More than one mode exists, only the first is reported

Table 3.7.5.
Repeated Measures ANOVA - Within Subjects Effects Overall EMV

	Sum of Squares	*df*	*Mean Square*	*F*	*p*	*η²*
RM Factor 1	1.203e +10	2	6.016e +9	63.74	< .001	0.248
Residual	3.643e +10	386	9.438e +7			

Note. Type III Sum of Squares
[a] Mauchly's test of sphericity indicates that the assumption of sphericity is violated (p < .05).

Table 3.7.6.
Post Hoc Comparisons - Overall EMV

		Mean Difference	*SE*	*t*	p_{bonf}	*d*
HA/HV	LA/LV	6347	986.4	6.435	< .001	0.97
	LA/NV	11099	986.4	11.252	< .001	1.35
LA/LV	LA/NV	4752	986.4	4.817	< .001	0.16

Table 3.7.7.

Bayesian Repeated Measures ANOVA- Model Comparison Overall EMV

Models	*P(M)*	*P(M|data)*	*BF $_M$*	*BF $_{10}$*	*error %*
Null model (incl. subject)	0.5	4.152e -25	4.152e -25	1	
RM Factor 1	0.5	1	2.409e +24	2.409e +24	2.594

Note. All models include subject.

Table 3.7.8.
Within Subjects Effects - Isoline Area for Men

	Sphericity Correction	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*	*η²*
RM Factor 1	None	1.634e +10	2	8.169e +9	44.64	< .001	0.317
	Greenhouse-Geisser	1.634e +10	1.815	9.001e +9	44.64	< .001	0.317
Residual	None	3.513e +10	192	1.830e +8			
	Greenhouse-Geisser	3.513e +10	174.234	2.016e +8			

Note. Type III Sum of Squares
[a] Mauchly's test of sphericity indicates that the assumption of sphericity is violated (p < .05).

Table 3.7.9.
Post Hoc Comparisons - Isoline Areas for Men

		Mean Difference	*SE*	*t*	*p $_{bonf}$*	*d*
HA/HV	LA/LV	15497.4	1942	7.978	< .001	1.136
	LA/NV	16263.9	1942	8.373	< .001	1.489
LA/LV	LA/NV	766.5	1942	0.395	1	0.058

Table 3.8.0.
Bayesian Repeated Measures ANOVA - Isoline Area for Men

Models	*P(M)*	*P(M|data)*	*BF $_M$*	*BF $_{10}$*	*error %*
Null model (incl. subject)	0.5	3.116e -17	3.116e - 17	1	
RM Factor 1	0.5	1	3.209e +1 6	3.209e +16	0.601

Note. All models include subject.

Table 3.8.1.
Within Subjects Effects - Isoline Area for Women

	Sphericity Correction	*Sum of Squares*	*df*	*Mean Square*	*F*	*p*	*η²*
RM Factor 1	None	4.693e +9	2	2.346e +9	33.8	< .001	0.26
	Greenhouse-Geisser	4.693e +9	1.919	2.445e +9	33.8	< .001	0.26
Residual	None	1.333e +10	192	6.943e +7			
	Greenhouse-Geisser	1.333e +10	184.226	7.236e +7			

Note. Type III Sum of Squares

Table 3.8.2.
Post Hoc Comparisons - Isoline Areas for Women

		Mean Difference	*SE*	*t*	p_{bonf}	*d*
HA/HV	LA/LV	6941	1196	5.801	< .001	0.929
	LA/NV	9507	1196	7.946	< .001	1.579
LA/LV	LA/NV	2566	1196	2.145	0.1	0.376

Table 3.8.3.
Bayesian Repeated Measures ANOVA - Isoline Area for Women

Models	**P(M)**	**P(M|data)**	BF_M	BF_{10}	**error %**
Null model (incl. subject)	0.5	3.972e -13	3.972e -13	1	
RM Factor 1	0.5	1	2.517e +12	2.517e +12	1.111

Note. All models include subject.

Table 3.8.4.
Independent Samples T-Test - Men vs Women for High Arousal/High Valence Video Segment

	t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*
HA/HV	12.78	402	< .001	10709	838.2	1.271

[a] Levene's test is significant (p < .05), suggesting a violation of the equal variance assumption

Table 3.8.5.
Bayesian Independent Samples T-Test - Men vs Women for High Arousal/High Valence Video Segment

	BF_{10}	error %
HA/HV	1.795e +28	1.536e -36

Table 3.8.6.
Independent Samples T-Test - Men vs Women for Low Arousal/Low Valence Video Segment

	t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*
LA/LV	1.711	192	0.089	3328	1945	0.246

Note. Student's T-Test.
[a] Levene's test is significant (p < .05), suggesting a violation of the equal variance assumption

Table 3.8.7.
Bayesian Independent Samples T-Test - Men vs Women for Low Arousal/Low Valence Video Segment

	BF_{10}	*error %*
Movie 2	0.61	3.369e -8

Table 3.8.8.
Independent Samples T-Test - Men vs Women for Low Arousal/Neutral Valence Video Segment

	t	*df*	*p*	*Mean Difference*	*SE Difference*	*Cohen's d*
Movie 3	5.587	388	< .001	5518	987.6	0.566

Note. Student's T-Test.
[a] Levene's test is significant (p < .05), suggesting a violation of the equal variance assumption

Table 3.8.9.

Bayesian Independent Samples T-Test - Men vs Women for Low Arousal/Neutral Valence Video Segment

	BF_{10}	*error %*
Movie 3	241388	6.550e -13

Pupillometry

Table 3.9.0.
Repeated Measures ANOVA - Within Subjects Effects Overall Pupillometry

	Sum of Squares	***df***	***Mean Square***	***F***	***p***	η^2
RM Factor 1	6.481e +7	2	3.241e +7	589.1	< .001	0.149
Residual	3.700e +8	6726	55008			

Note. Type III Sum of Squares
[a] Mauchly's test of sphericity indicates that the assumption of sphericity is violated ($p < .05$).

Table 3.9.1.
Post Hoc Comparisons - Overall Pupillometry

		Mean Difference	***SE***	***t***	p_{bonf}	***d***
LA/NV	LA/LV	7.509	5.719	1.313	0.568	0.206
	HA/HV	173.632	5.719	30.362	< .001	0.398
LA/LV	HA/HV	166.123	5.719	29.049	< .001	0.614

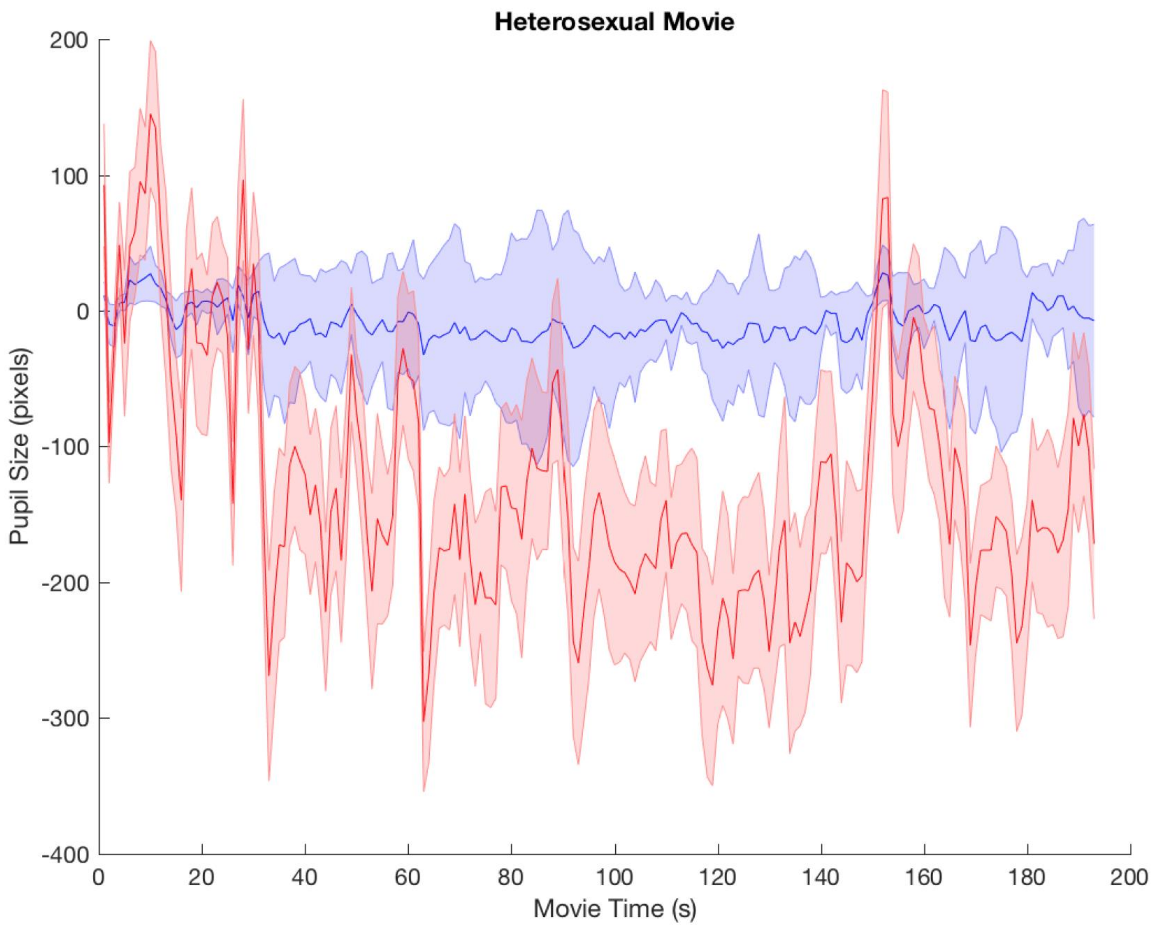

Figure 1. Graphed effect size (i.e.: Cohen's d) of the mean difference between the pupillary data for women from that of the men over the time duration of the High Arousal/High Valence segment.

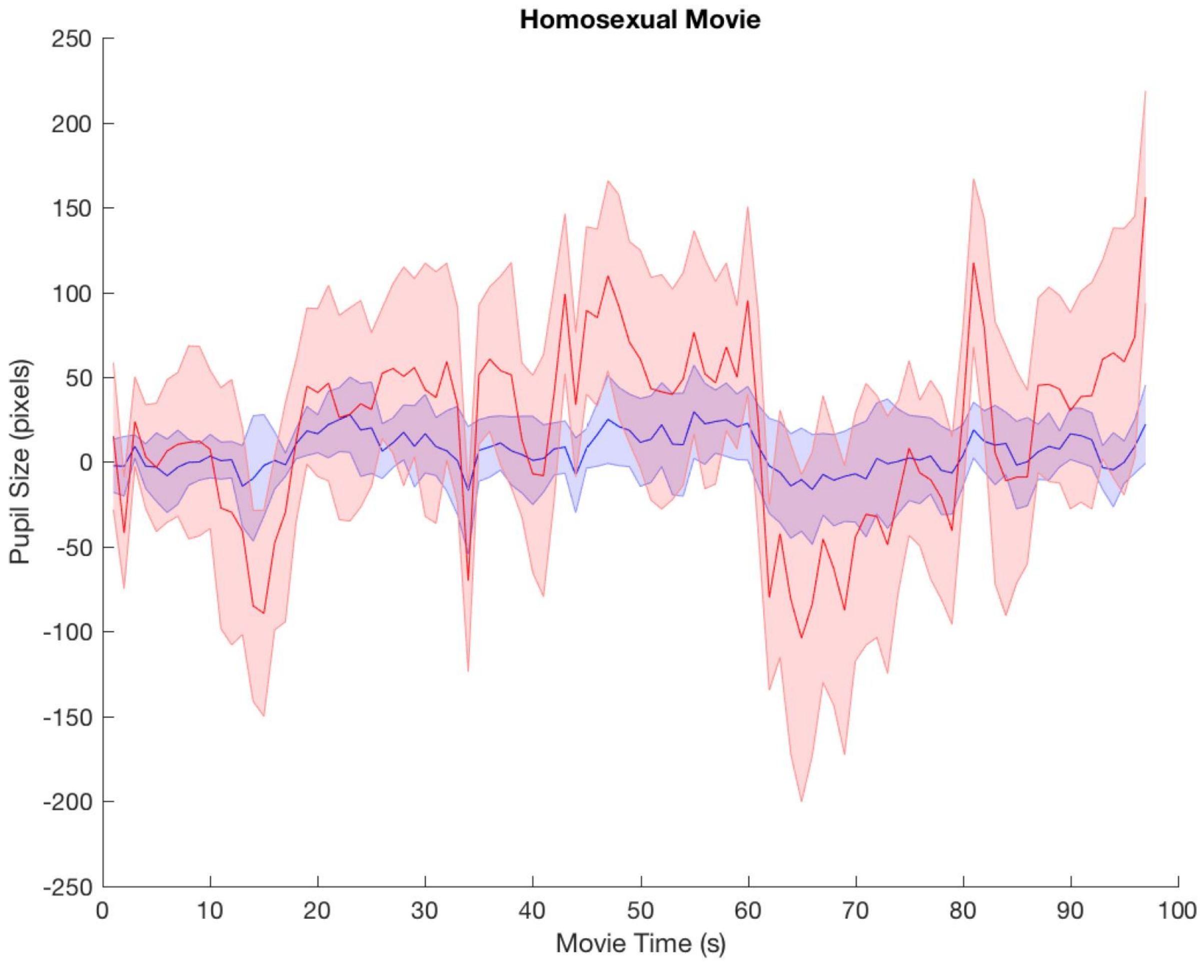

Figure 2. Graphed effect size (i.e.: Cohen's d) of the mean difference between the pupillary data for women from that of the men over the time duration of the Low Arousal/Low Valence segment.

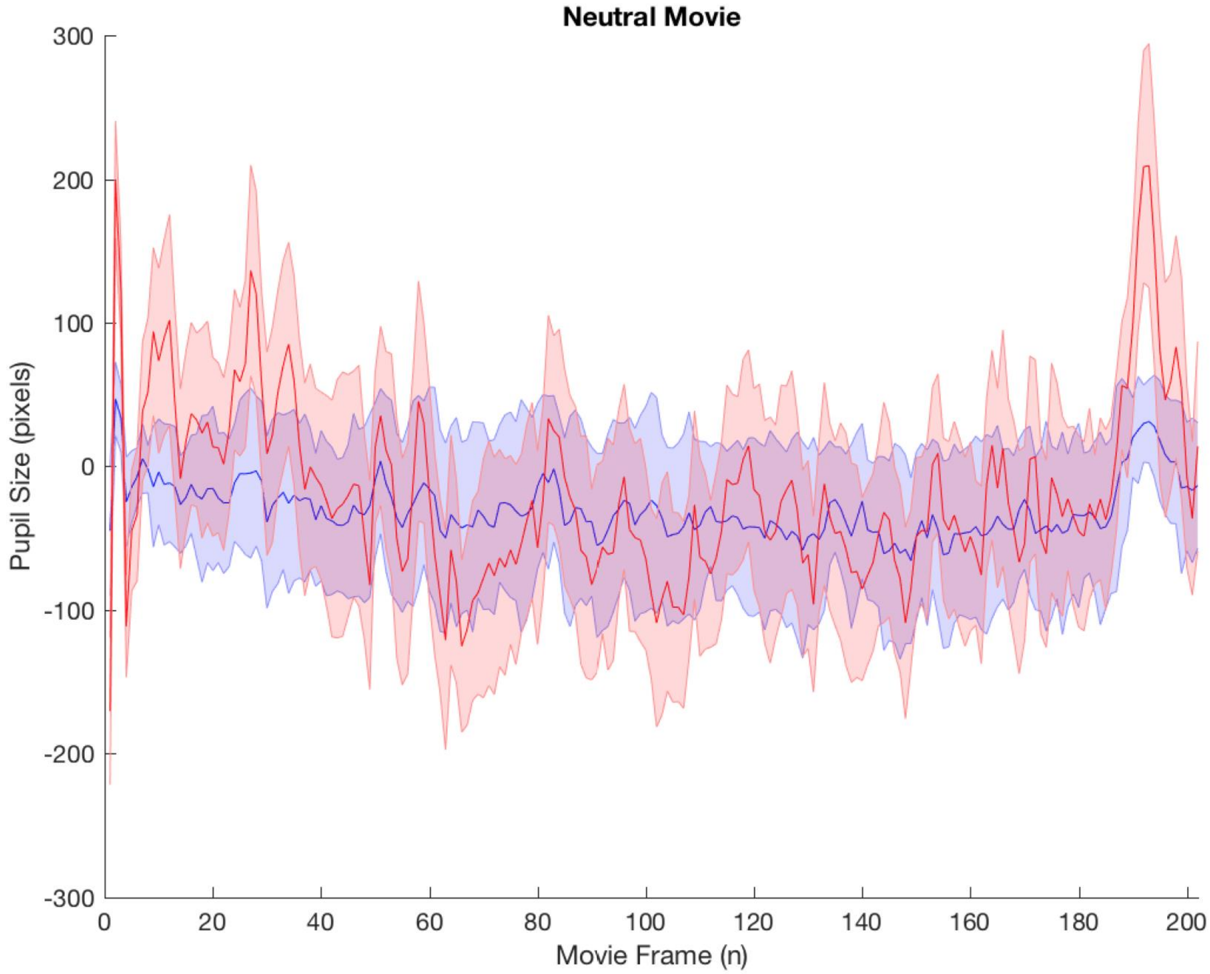

Figure 3. Graphed effect size (i.e.: Cohen's d) of the mean difference between the pupillary data for women from that of the men over the time duration of the Low Arousal/Neutral Valence segment.

Combination Statistics

Valence & Arousal and SADI

Table 3.9.2.

Pearson Correlations - SADI Components and Valence and Arousal Ratings Overall

		Eval - HA/HV	*Eval - LA/NV*	*Eval - LA/LV*	*Mot - HA/HV*	*Mot - LA/NV*	*Mot - LA/LV*	*Neg - HA/HV*	*Neg - LA/NV*	*Neg - LA/LV*	*Phys - HA/HV*	*Phys - LA/NV*	*Phys - LA/LV*
A - HA/HV	Pearson's r	-0.017	-0.108	-0.048	0.083	0.035	-0.01	-0.132	0.216	0.154	-0.085	-0.146	-0.134
	p-value	0.916	0.513	0.77	0.615	0.833	0.954	0.422	0.187	0.35	0.605	0.374	0.415
	Upper 95% CI	0.3	0.215	0.271	0.388	0.347	0.307	0.191	0.498	0.448	0.236	0.177	0.189
	Lower 95% CI	-0.331	-0.409	-0.358	-0.239	-0.284	-0.324	-0.43	-0.107	-0.17	-0.39	-0.441	-0.432
A - LA/LV	Pearson's r	-0.108	-0.162	-0.11	-0.063	-0.171	-0.001	-0.164	-0.176	-0.07	-0.067	-0.219	-0.201
	p-value	0.512	0.325	0.506	0.702	0.298	0.993	0.319	0.285	0.671	0.685	0.18	0.22
	Upper 95% CI	0.215	0.162	0.213	0.257	0.153	0.314	0.16	0.148	0.251	0.254	0.103	0.122
	Lower 95% CI	-0.41	-0.454	-0.411	-0.371	-0.462	-0.317	-0.456	-0.465	-0.377	-0.375	-0.5	-0.486
A - LA/NV	Pearson's r	-0.053	0.084	-0.071	0.019	0.142	0.172	-0.165	-0.016	-0.036	0.264	-0.07	0.062
	p-value	0.749	0.611	0.668	0.907	0.39	0.294	0.317	0.921	0.83	0.104	0.673	0.708
	Upper 95% CI	0.267	0.389	0.25	0.333	0.438	0.463	0.159	0.301	0.283	0.535	0.251	0.37
	Lower 95% CI	-0.362	-0.238	-0.378	-0.298	-0.182	-0.151	-0.456	-0.33	-0.347	-0.056	-0.377	-0.259
V - LA/LV	Pearson's r	0.032	0.003	0.034	-0.052	0.02	-0.267	0.091	0.085	0.099	-0.151	-0.388	-0.128
	p-value	0.845	0.988	0.835	0.753	0.905	0.1	0.58	0.609	0.55	0.358	0.015*	0.438
	Upper 95% CI	0.344	0.318	0.346	0.268	0.333	0.053	0.396	0.39	0.402	0.173	-0.082	0.196
	Lower 95% CI	-0.286	-0.313	-0.284	-0.362	-0.298	-0.537	-0.231	-0.237	-0.224	-0.445	-0.627	-0.426
V - LA/LV	Pearson's r	-0.151	-0.243	0.037	-0.1	-0.103	-0.137	-0.047	-0.256	0.136	-0.259	-0.193	-0.199
	p-value	0.358	0.136	0.822	0.544	0.531	0.407	0.776	0.116	0.409	0.111	0.24	0.224
	Upper 95% CI	0.173	0.078	0.349	0.222	0.219	0.187	0.272	0.065	0.433	0.061	0.131	0.124
	Lower 95% CI	-0.445	-0.519	-0.282	-0.403	-0.406	-0.433	-0.357	-0.529	-0.187	-0.531	-0.479	-0.484
V - LA/NV	Pearson's r	-0.05	0.127	-0.038	-0.219	-0.043	-0.137	-0.131	-0.244	-0.227	0.001	-0.063	-0.143
	p-value	0.761	0.442	0.82	0.181	0.797	0.407	0.426	0.134	0.164	0.996	0.705	0.384
	Upper 95% CI	0.27	0.425	0.281	0.104	0.277	0.187	0.192	0.077	0.095	0.316	0.258	0.18
	Lower 95% CI	-0.36	-0.197	-0.349	-0.5	-0.353	-0.433	-0.429	-0.52	-0.506	-0.315	-0.371	-0.439

Table 3.9.3.
Bayesian Correlations - SADI Components and Valence and Arousal Ratings Overall

		Eval - HA/HV	*Eval - LA/NV*	*Eval - LA/LV*	*Mot - HA/HV*	*Mot - LA/NV*	*Mot - LA/LV*	*Neg - HA/HV*	*Neg - LA/NV*	*Neg - LA/LV*	*Phys - HA/HV*	*Phys - LA/NV*	*Phys - LA/LV*
A - HA/HV	Pearson's r	-0.017	-0.108	-0.048	0.083	0.035	-0.01	-0.132	0.216	0.154	-0.085	-0.146	-0.134
	BF_{10}	0.2	0.245	0.208	0.225	0.204	0.2	0.272	0.462	0.304	0.227	0.292	0.275
A - LA/LV	Pearson's r	-0.108	-0.162	-0.11	-0.063	-0.171	-0.001	-0.164	-0.176	-0.07	-0.067	-0.219	-0.201
	BF_{10}	0.245	0.318	0.247	0.214	0.336	0.199	0.322	0.346	0.218	0.216	0.475	0.412
A - LA/NV	Pearson's r	-0.053	0.084	-0.071	0.019	0.142	0.172	-0.165	-0.016	-0.036	0.264	-0.07	0.062
	BF_{10}	0.21	0.226	0.218	0.201	0.285	0.339	0.323	0.2	0.204	0.711	0.217	0.213
V - HA/HV	Pearson's r	0.032	0.003	0.034	-0.052	0.02	-0.267	0.091	0.085	0.099	-0.151	-0.388	-0.128
	BF_{10}	0.203	0.199	0.204	0.209	0.201	0.735	0.231	0.226	0.237	0.3	3.511	0.267
V - LA/LV	Pearson's r	-0.151	-0.243	0.037	-0.1	-0.103	-0.137	-0.047	-0.256	0.136	-0.259	-0.193	-0.199
	BF_{10}	0.3	0.583	0.204	0.238	0.241	0.278	0.207	0.659	0.277	0.678	0.388	0.407
V - LA/NV	Pearson's r	-0.05	0.127	-0.038	-0.219	-0.043	-0.137	-0.131	-0.244	-0.227	0.001	-0.063	-0.143
	BF_{10}	0.208	0.265	0.204	0.472	0.206	0.278	0.271	0.59	0.507	0.199	0.214	0.287

Table 3.9.4.
Pearson Correlations - SADI Components and Valence and Arousal Ratings Men

		Eval - HA/HV	*Eval - LA/NV*	*Eval - LA/LV*	*Mot - HA/HV*	*Mot - LA/NV*	*Mot - LA/LV*	*Neg - HA/HV*	*Neg - LA/NV*	*Neg - LA/LV*	*Phys - HA/HV*	*Phys - LA/NV*	*Phys - LA/LV*
A - HA/HV	Pearson's r	-0.213	NaN	0.27	0.213	NaN	-0.426	-0.067	-0.876	-0.073	0.426	NaN	-0.135
	p-value	0.685	NaN	0.605	0.685	NaN	0.399	0.899	0.022	0.891	0.399	NaN	0.799
	Upper 95% CI	0.724	NaN	0.887	0.874	NaN	0.589	0.787	-0.225	0.785	0.92	NaN	0.76
	Lower 95% CI	-0.874	NaN	-0.694	-0.724	NaN	-0.92	-0.833	-0.986	-0.835	-0.589	NaN	-0.853
A - LA/LV	Pearson's r	-0.217	NaN	-0.295	0.466	NaN	0.466	0.04	-0.335	0.523	0.683	NaN	-0.1
	p-value	0.679	NaN	0.571	0.352	NaN	0.352	0.94	0.517	0.287	0.135	NaN	0.851
	Upper 95% CI	0.722	NaN	0.679	0.927	NaN	0.927	0.825	0.655	0.937	0.962	NaN	0.775
	Lower 95% CI	-0.875	NaN	-0.893	-0.556	NaN	-0.556	-0.798	-0.901	-0.502	-0.288	NaN	-0.843
A - LA/NV	Pearson's r	-0.25	NaN	-0.158	0.625	NaN	0.25	-0.316	-0.553	0.171	0.875	NaN	0.316
	p-value	0.633	NaN	0.765	0.185	NaN	0.633	0.541	0.255	0.745	0.022	NaN	0.541
	Upper 95% CI	0.704	NaN	0.75	0.953	NaN	0.883	0.666	0.469	0.863	0.986	NaN	0.897
	Lower 95% CI	-0.883	NaN	-0.859	-0.379	NaN	-0.704	-0.897	-0.942	-0.744	0.219	NaN	-0.666
V - LA/LV	Pearson's r	0.632	NaN	0.4	0.158	NaN	0.158	-0.7	-0.4	0.217	0.316	NaN	0
	p-value	0.178	NaN	0.432	0.765	NaN	0.765	0.121	0.432	0.68	0.541	NaN	1
	Upper 95% CI	0.954	NaN	0.915	0.859	NaN	0.859	0.258	0.609	0.875	0.897	NaN	0.812
	Lower 95% CI	-0.368	NaN	-0.609	-0.75	NaN	-0.75	-0.964	-0.915	-0.722	-0.666	NaN	-0.812
V - LA/LV	Pearson's r	0.25	NaN	-0.316	0.5	NaN	-0.25	-0.158	-0.158	-0.686	-0.5	NaN	-0.316
	p-value	0.633	NaN	0.541	0.313	NaN	0.633	0.765	0.765	0.132	0.313	NaN	0.541
	Upper 95% CI	0.883	NaN	0.666	0.933	NaN	0.704	0.75	0.75	0.283	0.524	NaN	0.666

	Lower 95% CI	-0.704	NaN	-0.897	-0.524	NaN	-0.883	-0.859	-0.859	-0.962	-0.933	NaN	-0.897
V - LA/NV	Pearson's r	0.25	NaN	0.632	0.125	NaN	-0.625	-0.632	-0.87	-0.429	0.25	NaN	0.158
	p-value	0.633	NaN	0.178	0.813	NaN	0.185	0.178	0.024	0.396	0.633	NaN	0.765
	Upper 95% CI	0.883	NaN	0.954	0.85	NaN	0.379	0.368	-0.197	0.587	0.883	NaN	0.859
	Lower 95% CI	-0.704	NaN	-0.368	-0.764	NaN	-0.953	-0.954	-0.986	-0.92	-0.704	NaN	-0.75

Table 3.9.5.
Bayesian Correlations - SADI Components and Valence and Arousal Ratings Men

		Eval - HA/HV	***Eval - LA/NV***	***Eval - LA/LV***	***Mot - HA/HV***	***Mot - LA/NV***	***Mot - LA/LV***	***Neg - HA/HV***	***Neg - LA/NV***	***Neg - LA/LV***	***Phys - HA/HV***	***Phys - LA/NV***	***Phys - LA/LV***
A - HA/HV	Pearson's r	-0.213	NaN	0.27	0.213	NaN	-0.426	-0.067	-0.876	-0.073	0.426	NaN	-0.135
	BF_{10}	0.528	NaN	0.552	0.528	NaN	0.669	0.494	4.026	0.495	0.669	NaN	0.505
A - LA/LV	Pearson's r	-0.217	NaN	-0.295	0.466	NaN	0.466	0.04	-0.335	0.523	0.683	NaN	-0.1
	BF_{10}	0.529	NaN	0.565	0.716	NaN	0.716	0.492	0.59	0.801	1.267	NaN	0.499
A - LA/NV	Pearson's r	-0.25	NaN	-0.158	0.625	NaN	0.25	-0.316	-0.553	0.171	0.875	NaN	0.316
	BF_{10}	0.543	NaN	0.511	1.042	NaN	0.543	0.578	0.859	0.514	3.968	NaN	0.578
V - HA/HV	Pearson's r	0.25	NaN	-0.316	0.5	NaN	-0.25	-0.158	-0.158	-0.686	-0.5	NaN	-0.316
	BF_{10}	0.543	NaN	0.578	0.764	NaN	0.543	0.511	0.511	1.28	0.764	NaN	0.578
V - LA/LV	Pearson's r	0.632	NaN	0.4	0.158	NaN	0.158	-0.7	-0.4	0.217	0.316	NaN	0
	BF_{10}	1.066	NaN	0.643	0.511	NaN	0.511	1.352	0.643	0.529	0.578	NaN	0.491
V - LA/NV	Pearson's r	0.25	NaN	0.632	0.125	NaN	-0.625	-0.632	-0.87	-0.429	0.25	NaN	0.158
	BF_{10}	0.543	NaN	1.066	0.503	NaN	1.042	1.066	3.766	0.672	0.543	NaN	0.511

Table 3.9.6.
Pearson Correlations - SADI Components and Valence and Arousal Ratings Women

		Eval - HA/HV	***Eval - LA/NV***	***Eval - LA/LV***	***Mot - HA/HV***	***Mot - LA/NV***	***Mot - LA/LV***	***Neg - HA/HV***	***Neg - LA/NV***	***Neg - LA/LV***	***Phys - HA/HV***	***Phys - LA/NV***	***Phys - LA/LV***
A - HA/HV	Pearson's r	0.165	-0.181	0.119	0.055	-0.002	0.055	-0.105	-0.18	NaN	0.164	0.25	0.244
	p-value	0.36	0.314	0.511	0.763	0.99	0.759	0.561	0.317	NaN	0.361	0.16	0.172
	Upper 95% CI	0.481	0.173	0.444	0.391	0.341	0.391	0.247	0.174	NaN	0.481	0.547	0.542
	Lower 95% CI	-0.189	-0.494	-0.234	-0.294	-0.345	-0.293	-0.433	-0.493	NaN	-0.19	-0.102	-0.109
A - LA/LV	Pearson's r	-0.224	-0.032	0.215	0.195	0.182	0.325	-0.132	-0.245	NaN	0.094	0.297	0.254
	p-value	0.21	0.861	0.229	0.278	0.311	0.065	0.464	0.169	NaN	0.603	0.093	0.154
	Upper 95% CI	0.129	0.315	0.52	0.504	0.494	0.601	0.221	0.107	NaN	0.424	0.581	0.549
	Lower 95% CI	-0.527	-0.371	-0.138	-0.159	-0.172	-0.021	-0.455	-0.543	NaN	-0.258	-0.052	-0.098
A - LA/NV	Pearson's r	0.309	-0.301	-0.182	0.231	-0.061	0.175	-0.056	-0.09	NaN	0.035	-0.16	-0.153
	p-value	0.08	0.089	0.31	0.197	0.738	0.331	0.758	0.618	NaN	0.847	0.375	0.394
	Upper 95% CI	0.59	0.048	0.172	0.532	0.289	0.489	0.293	0.261	NaN	0.374	0.194	0.201
	Lower 95% CI	-0.038	-0.584	-0.495	-0.122	-0.396	-0.179	-0.391	-0.42	NaN	-0.312	-0.477	-0.472
V - LA/LV	Pearson's r	0.14	-0.144	0.11	-0.213	-0.252	0.113	0.009	-0.426	NaN	-0.055	0.009	0.017
	p-value	0.437	0.423	0.541	0.235	0.158	0.529	0.961	0.014*	NaN	0.761	0.96	0.927
	Upper 95% CI	0.461	0.21	0.437	0.141	0.1	0.44	0.351	-0.097	NaN	0.294	0.351	0.358

	Lower 95% CI	-0.213	-0.464	-0.242	-0.518	-0.548	-0.239	-0.335	-0.671	NaN	-0.391	-0.335	-0.329
V - LA/LV	Pearson's r	-0.154	0.178	0.458**	0.033	0.015	0.255	-0.122	-0.226	NaN	-0.032	0.147	0.185
	p-value	0.393	0.322	0.007	0.853	0.932	0.152	0.498	0.206	NaN	0.858	0.413	0.302
	Upper 95% CI	0.2	0.491	0.693	0.372	0.357	0.55	0.231	0.127	NaN	0.315	0.467	0.497
	Lower 95% CI	-0.472	-0.176	0.136	-0.313	-0.33	-0.097	-0.447	-0.528	NaN	-0.371	-0.206	-0.169
V - LA/NV	Pearson's r	-0.008	-0.049	-0.01	-0.028	-0.062	0.262	0.031	-0.069	NaN	-0.31	-0.321	-0.312
	p-value	0.965	0.788	0.957	0.877	0.733	0.141	0.862	0.701	NaN	0.079	0.069	0.077
	Upper 95% CI	0.336	0.3	0.335	0.318	0.288	0.555	0.371	0.281	NaN	0.037	0.026	0.035
	Lower 95% CI	-0.35	-0.386	-0.352	-0.368	-0.397	-0.09	-0.315	-0.403	NaN	-0.59	-0.598	-0.592

Table 3.9.7.
Bayesian Correlations - SADI Components and Valence and Arousal Ratings Women

		Eval - HA/HV	*Eval - LA/NV*	*Eval - LA/LV*	*Mot - HA/HV*	*Mot - LA/NV*	*Mot - LA/LV*	*Neg - HA/HV*	*Neg - LA/NV*	*Neg - LA/LV*	*Phys - HA/HV*	*Phys - LA/NV*	*Phys - LA/LV*
A - HA/HV	Pearson's r	0.165	-0.181	0.119	0.055	-0.002	0.055	-0.105	-0.18	NaN	0.164	0.25	0.244
	BF_{10}	0.324	0.352	0.266	0.226	0.217	0.226	0.255	0.35	NaN	0.323	0.557	0.53
A - LA/LV	Pearson's r	-0.224	-0.032	0.215	0.195	0.182	0.325	-0.132	-0.245	NaN	0.094	0.297	0.254
	BF_{10}	0.46	0.22	0.434	0.381	0.354	1.103	0.28	0.535	NaN	0.247	0.834	0.575
A - LA/NV	Pearson's r	0.309	-0.301	-0.182	0.231	-0.061	0.175	-0.056	-0.09	NaN	0.035	-0.16	-0.153
	BF_{10}	0.941	0.865	0.355	0.482	0.229	0.341	0.227	0.244	NaN	0.22	0.316	0.307
V - HA/HV	Pearson's r	0.14	-0.144	0.11	-0.213	-0.252	0.113	0.009	-0.426	NaN	-0.055	0.009	0.017
	BF_{10}	0.289	0.294	0.259	0.426	0.564	0.262	0.217	4.028	NaN	0.226	0.217	0.217
V - LA/LV	Pearson's r	-0.154	0.178	0.458	0.033	0.015	0.255	-0.122	-0.226	NaN	-0.032	0.147	0.185
	BF_{10}	0.307	0.347	6.793	0.22	0.217	0.578	0.27	0.466	NaN	0.22	0.299	0.361
V - LA/NV	Pearson's r	-0.008	-0.049	-0.01	-0.028	-0.062	0.262	0.031	-0.069	NaN	-0.31	-0.321	-0.312
	BF_{10}	0.217	0.224	0.217	0.219	0.229	0.611	0.22	0.232	NaN	0.948	1.057	0.971

Heart Rate Variability and Valence & Arousal Ratings

Table 3.9.8.
Pearson Correlations - Overall HRV and Valence & Arousal Ratings per Video

		HR_LA/NV	*HR_LA/LV*	*HR_HA/HV*
HA/HV_A	Pearson's r	-0.271	-0.091	-0.057
	p-value	0.095	0.582	0.731
	Upper 95% CI	0.048	0.231	0.263
	Lower 95% CI	-0.541	-0.395	-0.366
LA/LV_A	Pearson's r	-0.04	0.145	0.07
	p-value	0.809	0.377	0.673
	Upper 95% CI	0.279	0.441	0.377
	Lower 95% CI	-0.351	-0.178	-0.251
LA/NV_A	Pearson's r	-0.023	0.067	-0.007
	p-value	0.891	0.685	0.964
	Upper 95% CI	0.295	0.375	0.309
	Lower 95% CI	-0.336	-0.254	-0.322
HA/HV_V	Pearson's r	-0.17	0.041	0.011
	p-value	0.3	0.802	0.945
	Upper 95% CI	0.153	0.352	0.326
	Lower 95% CI	-0.461	-0.278	-0.305
LA/LV_V	Pearson's r	-0.302	-0.186	-0.24
	p-value	0.062	0.257	0.141
	Upper 95% CI	0.015	0.138	0.082
	Lower 95% CI	-0.564	-0.474	-0.516
LA/NV_V	Pearson's r	-0.028	0.072	-0.002
	p-value	0.867	0.663	0.992
	Upper 95% CI	0.29	0.379	0.314
	Lower 95% CI	-0.34	-0.249	-0.317

Table 3.9.9.
Bayesian Pearson Correlations - Overall HRV and Valence & Arousal Ratings per Video

		HR_LA/NV	*HR_LA/LV*	*HR_HA/HV*
HA/HV_A	Pearson's r	-0.271	-0.091	-0.057
	BF_{10}	0.767	0.231	0.211
LA/LV_A	Pearson's r	-0.04	0.145	0.07
	BF_{10}	0.205	0.29	0.217
LA/NV_A	Pearson's r	-0.023	0.067	-0.007
	BF_{10}	0.201	0.216	0.2
HA/HV_V	Pearson's r	-0.17	0.041	0.011
	BF_{10}	0.335	0.206	0.2
LA/LV_V	Pearson's r	-0.302	-0.186	-0.24
	BF_{10}	1.074	0.371	0.567
LA/NV_V	Pearson's r	-0.028	0.072	-0.002
	BF_{10}	0.202	0.219	0.199

Table 3.1.0.0.
Pearson Correlations - High Frequency HRV and Valence and Arousal Ratings

		HF_LA/NV	***HF_LA/LV***	***HF_HA/HV***
HA/HV_A	Pearson's r	0.047	0.081	-0.002
	p-value	0.845	0.735	0.994
	Upper 95% CI	0.479	0.505	0.441
	Lower 95% CI	-0.404	-0.375	-0.444
LA/LV_A	Pearson's r	0.299	0.084	-0.153
	p-value	0.201	0.726	0.521
	Upper 95% CI	0.655	0.507	0.311
	Lower 95% CI	-0.166	-0.373	-0.557
LA/NV_A	Pearson's r	-0.021	0.203	-0.014
	p-value	0.93	0.391	0.952
	Upper 95% CI	0.426	0.592	0.431
	Lower 95% CI	-0.459	-0.263	-0.454
HA/HV_V	Pearson's r	-0.069	0.025	0.183
	p-value	0.773	0.915	0.441
	Upper 95% CI	0.385	0.463	0.578
	Lower 95% CI	-0.496	-0.422	-0.283
LA/LV_V	Pearson's r	0.2	0.015	-0.146
	p-value	0.399	0.95	0.54
	Upper 95% CI	0.59	0.454	0.317
	Lower 95% CI	-0.266	-0.43	-0.552
LA/NV_V	Pearson's r	0.179	-0.152	-0.394
	p-value	0.449	0.522	0.086
	Upper 95% CI	0.576	0.311	0.059
	Lower 95% CI	-0.286	-0.557	-0.712

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

Table 3.1.0.1.
Bayesian Pearson Correlations - High Frequency HRV and Valence and Arousal Ratings

		HF_LA/NV	*HF_LA/LV*	*HF_HA/HV*
HA/HV_A	Pearson's r	0.047	0.081	-0.002
	BF_{10}	0.282	0.292	0.277
LA/LV_A	Pearson's r	0.299	0.084	-0.153
	BF_{10}	0.595	0.293	0.336
LA/NV_A	Pearson's r	-0.021	0.203	-0.014
	BF_{10}	0.278	0.391	0.277
HA/HV_V	Pearson's r	-0.069	0.025	0.183
	BF_{10}	0.288	0.278	0.366
LA/LV_V	Pearson's r	0.2	0.015	-0.146
	BF_{10}	0.386	0.277	0.33
LA/NV_V	Pearson's r	0.179	-0.152	-0.394
	BF_{10}	0.362	0.335	1.099

Table 3.1.0.2.
Pearson Correlations - Low Frequency HRV and Valence and Arousal Ratings

		HF_LA/NV	*HF_LA/LV*	*HF_HA/HV*
HA/HV_A	Pearson's r	-0.116	-0.304	0.047
	p-value	0.636	0.206	0.849
	Upper 95% CI	0.357	0.175	0.491
	Lower 95% CI	-0.542	-0.666	-0.416
LA/LV_A	Pearson's r	-0.386	0.046	-0.005
	p-value	0.103	0.852	0.983
	Upper 95% CI	0.083	0.49	0.45
	Lower 95% CI	-0.715	-0.417	-0.458
LA/NV_A	Pearson's r	0.093	-0.064	-0.112
	p-value	0.706	0.793	0.647
	Upper 95% CI	0.525	0.402	0.36
	Lower 95% CI	-0.377	-0.504	-0.539
HA/HV_V	Pearson's r	0.033	-0.161	0.046
	p-value	0.894	0.51	0.853
	Upper 95% CI	0.48	0.316	0.49
	Lower 95% CI	-0.428	-0.573	-0.417
LA/LV_V	Pearson's r	0.125	0.181	0.127
	p-value	0.609	0.459	0.604
	Upper 95% CI	0.548	0.587	0.55
	Lower 95% CI	-0.349	-0.298	-0.347
LA/NV_V	Pearson's r	-0.096	-0.23	-0.268
	p-value	0.697	0.344	0.267
	Upper 95% CI	0.375	0.251	0.212
	Lower 95% CI	-0.527	-0.619	-0.644

Table 3.1.0.3.
Bayesian Pearson Correlations - Low Frequency HRV and Valence and Arousal Ratings

		HF_LA/NV	*HF_LA/LV*	*HF_HA/HV*
HA/HV_A	Pearson's r	-0.116	0.047	-0.304
	BF_{10}	0.315	0.289	0.598
LA/LV_A	Pearson's r	-0.386	-0.005	0.046
	BF_{10}	0.984	0.284	0.288
LA/NV_A	Pearson's r	0.093	-0.112	-0.064
	BF_{10}	0.303	0.313	0.293
HA/HV_V	Pearson's r	0.033	0.046	-0.161
	BF_{10}	0.286	0.288	0.348
LA/LV_V	Pearson's r	0.125	0.127	0.181
	BF_{10}	0.321	0.322	0.367
LA/NV_V	Pearson's r	-0.096	-0.268	-0.23
	BF_{10}	0.305	0.504	0.431

Table 3.1.0.4.
Pearson Correlations - Women HRV and Valence and Arousal Ratings

		HA/HV - A	*LA/LV - A*	*LA/NV - A*	*HA/HV - V*	*LA/LV - V*	*LA/NV - V*
LA/NV	Pearson's r	-0.166	-0.013	-0.136	-0.177	-0.243	-0.177
	p-value	0.355	0.941	0.45	0.325	0.173	0.324
	Upper 95% CI	0.188	0.331	0.217	0.177	0.109	0.177
	Lower 95% CI	-0.482	-0.355	-0.458	-0.49	-0.541	-0.491
LA/LV	Pearson's r	-0.008	0.249	-0.068	0.042	-0.026	-0.101
	p-value	0.966	0.162	0.706	0.816	0.885	0.577
	Upper 95% CI	0.336	0.546	0.282	0.38	0.32	0.251
	Lower 95% CI	-0.35	-0.103	-0.402	-0.306	-0.366	-0.429
HA/HV	Pearson's r	-0.001	0.147	-0.004	0.037	-0.178	-0.215
	p-value	0.998	0.413	0.98	0.839	0.322	0.231
	Upper 95% CI	0.343	0.467	0.339	0.375	0.176	0.139
	Lower 95% CI	-0.344	-0.206	-0.347	-0.311	-0.491	-0.52

Table 3.1.0.5.
Bayesian Pearson Correlations - Women HRV and Valence and Arousal Ratings

		HA/HV - A	*LA/LV - A*	*LA/NV - A*	*HA/HV - V*	*LA/LV - V*
LA/NV	Pearson's r	-0.166	-0.013	-0.136	-0.177	-0.243
	BF_{10}	0.326	0.217	0.285	0.345	0.528
LA/LV	Pearson's r	-0.008	0.249	-0.068	0.042	-0.026
	BF_{10}	0.217	0.554	0.232	0.222	0.219
HA/HV	Pearson's r	-0.001	0.147	-0.004	0.037	-0.178
	BF_{10}	0.217	0.298	0.217	0.221	0.347

Table 3.1.0.6.
Pearson Correlations - Men HRV and Valence and Arousal Ratings

		HA/HV - A	*LA/LV - A*	*LA/NV - A*	*HA/HV - V*	*LA/LV - V*	*LA/NV - V*
LA/NV	Pearson's r	0.346	0.384	0.644	0.451	-0.056	0.328
	p-value	0.502	0.452	0.167	0.369	0.917	0.526
	Upper 95% CI	0.904	0.911	0.956	0.924	0.792	0.9
	Lower 95% CI	-0.647	-0.621	-0.35	-0.569	-0.83	-0.659
LA/LV	Pearson's r	0.475	0.577	0.841	0.157	-0.054	0.317
	p-value	0.341	0.231	0.036	0.766	0.919	0.54
	Upper 95% CI	0.929	0.946	0.982	0.859	0.792	0.898
	Lower 95% CI	-0.548	-0.442	0.092	-0.75	-0.829	-0.666
HA/HV	Pearson's r	-0.085	-0.114	0.382	-0.063	-0.613	-0.036
	p-value	0.873	0.83	0.454	0.906	0.195	0.946
	Upper 95% CI	0.78	0.769	0.911	0.789	0.395	0.799
	Lower 95% CI	-0.839	-0.847	-0.622	-0.832	-0.951	-0.823

Table 3.1.0.7.
Bayesian Pearson Correlations - Men HRV and Valence and Arousal Ratings

		HA/HV - A	*LA/LV - A*	*LA/NV - A*	*HA/HV - V*	*LA/LV - V*	*LA/NV - V*
LA/NV	Pearson's r	0.346	0.384	0.644	0.451	-0.056	0.328
	BF_{10}	0.598	0.628	1.107	0.697	0.493	0.585
LA/LV	Pearson's r	0.475	0.577	0.841	0.157	-0.054	0.317
	BF_{10}	0.728	0.91	2.941	0.51	0.493	0.579
HA/HV	Pearson's r	-0.085	-0.114	0.382	-0.063	-0.613	-0.036
	BF_{10}	0.496	0.501	0.627	0.494	1.006	0.492

Heart Rate Variability and Eye Movement Variability

Table 3.1.0.8.
Pearson Correlations - HRV and ET Data across all videos

		ET_HA/HV	*ET_LA/LV*	*ET_LA/NV*
HR_HA/HV	Pearson's r	-0.277	-0.106	-0.12
	p-value	0.079	0.509	0.453
	Upper 95% CI	0.033	0.208	0.194
	Lower 95% CI	-0.539	-0.401	-0.413
HR_LA/LV	Pearson's r	0.018	0.058	0.007
	p-value	0.913	0.717	0.963
	Upper 95% CI	0.323	0.36	0.314
	Lower 95% CI	-0.292	-0.254	-0.301
HR_LA/NV	Pearson's r	-0.08	-0.023	-0.211
	p-value	0.62	0.886	0.184
	Upper 95% CI	0.234	0.287	0.103
	Lower 95% CI	-0.378	-0.328	-0.487

Table 3.1.0.9.
Bayesian Pearson Correlations - HRV and ET Data across all videos

		ET_HA/HV	*ET_LA/LV*	*ET_LA/NV*
HR_HA/HV	Pearson's r	-0.277	-0.106	-0.12
	BF_{10}	0.862	0.24	0.255
HR_LA/LV	Pearson's r	0.018	0.058	0.007
	BF_{10}	0.196	0.207	0.195
HR_LA/NV	Pearson's r	-0.08	-0.023	-0.211
	BF_{10}	0.219	0.196	0.456

Table 3.1.1.0.
Pearson Correlations - HRV and ET data for Men across all Videos

		ET - HA/HV	*ET - LA/LV*	*ET - LV/NV*
HR - LA/NV	Pearson's r	0.185	-0.141	0.236
	p-value	0.725	0.789	0.652
	Upper 95% CI	0.867	0.757	0.879
	Lower 95% CI	-0.737	-0.855	-0.712
HR - LA/LV	Pearson's r	0.031	-0.123	0.426
	p-value	0.954	0.816	0.4
	Upper 95% CI	0.822	0.765	0.92
	Lower 95% CI	-0.801	-0.85	-0.589
HR - HA/HV	Pearson's r	0.669	0.22	0.807
	p-value	0.146	0.676	0.052
	Upper 95% CI	0.96	0.875	0.978
	Lower 95% CI	-0.311	-0.72	-0.014

Table 3.1.1.1.
Bayesian Pearson Correlations - HRV and ET data for Men across all Videos

		ET - HA/HV	*ET - LA/LV*	*ET - LV/NV*
HR - LA/NV	Pearson's r	0.185	-0.141	0.236
	BF_{10}	0.518	0.507	0.537
HR - LV/LV	Pearson's r	0.031	-0.123	0.426
	BF_{10}	0.492	0.503	0.669
HR - HA/HV	Pearson's r	0.669	0.22	0.807
	BF_{10}	1.205	0.53	2.313

Table 3.1.1.3.
Pearson Correlations - HRV and ET data for Women across all Videos

		ET - HA/HV	***ET - LA/LV***	***ET - LV/NV***
HR - LA/NV	Pearson's r	-0.299	-0.002	0.231
	p-value	0.081	0.991	0.182
	Upper 95% CI	0.038	0.331	0.524
	Lower 95% CI	-0.575	-0.335	-0.111
HR - LA/LV	Pearson's r	-0.086	-0.066	0.195
	p-value	0.623	0.705	0.263
	Upper 95% CI	0.254	0.273	0.496
	Lower 95% CI	-0.408	-0.391	-0.148
HR - HA/HV	Pearson's r	-0.286	-0.145	-0.056
	p-value	0.096	0.406	0.748
	Upper 95% CI	0.053	0.198	0.282
	Lower 95% CI	-0.565	-0.456	-0.382

Table 3.1.1.4.
Bayesian Pearson Correlations - HRV and ET data for Women across all Videos

		ET - HA/HV	***ET - LA/LV***	***ET - LV/NV***
HR - LA/NV	Pearson's r	-0.299	-0.002	0.231
	BF_{10}	0.911	0.21	0.495
HR - LV/LV	Pearson's r	-0.086	-0.066	0.195
	BF_{10}	0.236	0.225	0.384
HR - HA/HV	Pearson's r	-0.286	-0.145	-0.056
	BF_{10}	0.794	0.293	0.221

Heart Rate Variability and Pupillometry

Table 3.1.1.5.
Pearson Correlations - Pupillometry and ET Data across all Videos

		ET - LA/NV	***ET - LA/LV***	***ET - HA/HV***
Pup. - LA/NV	Pearson's r	0.132	0.077	0.187
	p-value	0.412	0.633	0.241
	Upper 95% CI	0.422	0.376	0.468
	Lower 95% CI	-0.183	-0.236	-0.128
Pup. - LA/LV	Pearson's r	0.059	0.222	-0.026
	p-value	0.713	0.163	0.872
	Upper 95% CI	0.36	0.496	0.284
	Lower 95% CI	-0.253	-0.092	-0.331
Pup. - HA/HV	Pearson's r	-0.199	-0.322	0.045
	p-value	0.211	0.04*	0.78
	Upper 95% CI	0.115	-0.016	0.348
	Lower 95% CI	-0.478	-0.573	-0.266

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

Table 3.1.1.6.
Bayesian Pearson Correlations - Pupillometry and ET Data across all Videos

		ET - LA/NV	***ET - LA/LV***	***ET - HA/HV***
Pup. - LA/NV	Pearson's r	0.132	0.077	0.187
	BF_{10}	0.269	0.217	0.378
Pup. - LA/LV	Pearson's r	0.059	0.222	-0.026
	BF_{10}	0.208	0.499	0.197
Pup. - HA/HV	Pearson's r	-0.199	-0.322	0.045
	BF_{10}	0.414	1.483	0.202

Table 3.1.1.7.
Pearson Correlations - Pupillometry and ET Data for Women across all Videos

		Pup. - HA/HV	*Pup. - LA/LV*	*Pup. - LA/NV*
HR - LA/NV	Pearson's r	-0.186	0.045	0.083
	p-value	0.286	0.795	0.634
	Upper 95% CI	0.157	0.373	0.405
	Lower 95% CI	-0.489	-0.292	-0.257
HR - LA/LV	Pearson's r	-0.204	-0.073	0.271
	p-value	0.24	0.677	0.115
	Upper 95% CI	0.139	0.267	0.554
	Lower 95% CI	-0.503	-0.397	-0.069
HR - HA/HV	Pearson's r	0.008	-0.1	-0.019
	p-value	0.962	0.569	0.915
	Upper 95% CI	0.341	0.242	0.317
	Lower 95% CI	-0.326	-0.419	-0.35

Table 3.1.1.8.
Bayesian Pearson Correlations - Pupillometry and ET Data for Women across all Videos

		Pup. - HA/HV	*Pup. - LA/LV*	*Pup. - LA/NV*
HR - LA/NV	Pearson's r	-0.186	0.045	0.083
	BF_{10}	0.364	0.217	0.235
HR - LA/LV	Pearson's r	-0.204	-0.073	0.271
	BF_{10}	0.408	0.229	0.692
HR - HA/HV	Pearson's r	0.008	-0.1	-0.019
	BF_{10}	0.211	0.246	0.211

Table 3.1.1.9.
Pearson Correlations - Pupillometry and ET Data for Men across all Videos

		Pup. - HA/HV	*Pup. - LA/LV*	*Pup. - LA/NV*
HR - LA/NV	Pearson's r	0.912	-0.13	0.569
	p-value	0.011*	0.806	0.239
	Upper 95% CI	0.99	0.762	0.944
	Lower 95% CI	0.388	-0.852	-0.451
HR - LA/LV	Pearson's r	0.919	-0.42	0.461
	p-value	0.01**	0.407	0.358
	Upper 95% CI	0.991	0.594	0.926
	Lower 95% CI	0.421	-0.918	-0.56
HR - HA/HV	Pearson's r	0.383	0.058	0.148
	p-value	0.453	0.913	0.78
	Upper 95% CI	0.911	0.831	0.857
	Lower 95% CI	-0.622	-0.791	-0.754

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

Table 3.1.2.0.
Bayesian Pearson Correlations - Pupillometry and ET Data for Men across all Videos

		Pup. - HA/HV	*Pup. - LA/LV*	*Pup. - LA/NV*
HR - LA/NV	Pearson's r	0.912	-0.13	0.569
	BF_{10}	6.128	0.504	0.892
HR - LA/LV	Pearson's r	0.919	-0.42	0.461
	BF_{10}	6.72	0.663	0.709
HR - HA/HV	Pearson's r	0.383	0.058	0.148
	BF_{10}	0.628	0.493	0.508

Eye Movement Variability and Valence and Arousal

Table 3.1.2.1.
Pearson Correlations - ET and Valence and Arousal Ratings across all Videos

		A - HA/HV	*A - LA/LV*	*A - LA/NV*	*V- HA/HV*	*V - LA/LV*	*V - LA/NV*
EM - HA/HV	Pearson's r	-0.166	-0.246	-0.081	0.138	-0.137	-0.039
	p-value	0.314	0.132	0.625	0.401	0.405	0.816
	Upper 95% CI	0.158	0.076	0.241	0.435	0.186	0.28
	Lower 95% CI	-0.457	-0.521	-0.386	-0.185	-0.434	-0.35
EM - LA/LV	Pearson's r	0.288	0.114	0.069	0.375	-0.03	0.051
	p-value	0.075	0.491	0.675	0.019*	0.858	0.759
	Upper 95% CI	0.553	0.414	0.377	0.617	0.289	0.361
	Lower 95% CI	-0.03	-0.209	-0.252	0.067	-0.342	-0.269
EM - LA/NV	Pearson's r	0.326	0.227	0.015	0.219	0.235	-0.223
	p-value	0.043*	0.164	0.926	0.18	0.15	0.171
	Upper 95% CI	0.581	0.507	0.329	0.5	0.512	0.099
	Lower 95% CI	0.011	-0.095	-0.302	-0.103	-0.087	-0.504

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

Table 3.1.2.2.
Bayesian Pearson Correlations - ET and Valence and Arousal Ratings across all Videos

		A - HA/HV	*A - LA/LV*	*A - LA/NV*	*V- HA/HV*	*V - LA/LV*	*V - LA/NV*
EM - HA/HV	Pearson's r	-0.166	-0.246	-0.081	0.138	-0.137	-0.039
	BF_{10}	0.325	0.596	0.224	0.28	0.279	0.205
EM - LA/LV	Pearson's r	0.288	0.114	0.069	0.375	-0.03	0.051
	BF_{10}	0.917	0.251	0.217	2.857	0.203	0.209
EM - LA/NV	Pearson's r	0.326	0.227	0.015	0.219	0.235	-0.223
	BF_{10}	1.436	0.508	0.2	0.474	0.541	0.492

Table 3.1.2.3.
Pearson Correlations - ET and Valence and Arousal Ratings for Women across all Videos

		A - HA/HV	***A - LA/LV***	***A - LA/NV***	***V- HA/HV***	***V - LA/LV***	***V - LA/NV***
EM - HA/HV	Pearson's r	-0.073	-0.034	-0.05	0.19	0.141	0.087
	p-value	0.686	0.851	0.783	0.291	0.434	0.632
	Upper 95% CI	0.277	0.313	0.299	0.5	0.462	0.418
	Lower 95% CI	-0.406	-0.373	-0.387	-0.164	-0.213	-0.265
EM - LA/LV	Pearson's r	0.066	-0.097	0.24	0.05	-0.015	0.307
	p-value	0.716	0.59	0.178	0.781	0.933	0.083
	Upper 95% CI	0.4	0.254	0.539	0.387	0.33	0.588
	Lower 95% CI	-0.284	-0.426	-0.112	-0.298	-0.357	-0.041
EM - LA/NV	Pearson's r	-0.052	0.114	0.081	-0.258	0.07	0.275
	p-value	0.773	0.527	0.652	0.147	0.697	0.122
	Upper 95% CI	0.296	0.44	0.413	0.093	0.404	0.565
	Lower 95% CI	-0.389	-0.239	-0.269	-0.553	-0.28	-0.076

Table 3.1.2.4.
Bayesian Pearson Correlations - ET and Valence and Arousal Ratings for Women across all Videos

		A - HA/HV	***A - LA/LV***	***A - LA/NV***	***V- HA/HV***	***V - LA/LV***	***V - LA/NV***
EM - HA/HV	Pearson's r	-0.073	-0.034	-0.05	0.19	0.141	0.087
	BF_{10}	0.234	0.22	0.225	0.37	0.29	0.242
EM - LA/LV	Pearson's r	0.066	-0.097	0.24	0.05	-0.015	0.307
	BF_{10}	0.231	0.249	0.517	0.225	0.217	0.917
EM - LA/NV	Pearson's r	-0.052	0.114	0.081	-0.258	0.07	0.275
	BF_{10}	0.225	0.262	0.239	0.594	0.233	0.683

Table 3.1.2.5.
Pearson Correlations - ET and Valence and Arousal Ratings for Men across all Videos

		A - HA/HV	*A - LA/LV*	*A - LA/NV*	*V- HA/HV*	*V - LA/LV*	*V - LA/NV*
EM - HA/HV	Pearson's r	-0.641	-0.677	-0.217	0.177	-0.67	-0.03
	p-value	0.171	0.14	0.68	0.737	0.145	0.955
	Upper 95% CI	0.356	0.298	0.722	0.865	0.31	0.801
	Lower 95% CI	-0.955	-0.961	-0.875	-0.741	-0.96	-0.822
EM - LA/LV	Pearson's r	0.034	-0.12	0.016	-0.559	0.204	0.549
	p-value	0.949	0.821	0.976	0.249	0.698	0.259
	Upper 95% CI	0.823	0.766	0.817	0.462	0.871	0.941
	Lower 95% CI	-0.8	-0.849	-0.806	-0.943	-0.728	-0.473
EM - LA/NV	Pearson's r	0.191	0.038	0.441	-0.602	-0.283	0.053
	p-value	0.717	0.942	0.381	0.206	0.587	0.92
	Upper 95% CI	0.868	0.824	0.922	0.41	0.686	0.829
	Lower 95% CI	-0.734	-0.798	-0.577	-0.95	-0.89	-0.793

Table 3.1.2.6.
Bayesian Pearson Correlations - ET and Valence and Arousal Ratings for Men across all Videos

		A - HA/HV	*A - LA/LV*	*A - LA/NV*	*V- HA/HV*	*V - LA/LV*	*V - LA/NV*
EM - HA/HV	Pearson's r	-0.641	-0.677	-0.217	0.177	-0.67	-0.03
	BF_{10}	1.094	1.239	0.529	0.516	1.208	0.492
EM - LA/LV	Pearson's r	0.034	-0.12	0.016	-0.559	0.204	0.549
	BF_{10}	0.492	0.502	0.491	0.871	0.525	0.85
EM - LA/NV	Pearson's r	0.191	0.038	0.441	-0.602	-0.283	0.053
	BF_{10}	0.52	0.492	0.685	0.975	0.559	0.493

Eye Movement Variability and Pupillometry

Table 3.1.2.7.
Pearson Correlations - Pupillometry and EMV Data across all Videos

		Pup. - LA/NV	*Pup. LA/LV*	*Pup. - HA/HV*
EM - HA/HV	Pearson's r	-0.383	-0.02	-0.05
	p-value	< .001***	0.694	0.319
	Upper 95% CI	-0.297	0.078	0.048
	Lower 95% CI	-0.463	-0.117	-0.146
EM - LA/LV	Pearson's r	-0.012	-0.056	-0.01
	p-value	0.862	0.438	0.894
	Upper 95% CI	0.128	0.085	0.13
	Lower 95% CI	-0.152	-0.194	-0.149
EM - LV/NV	Pearson's r	-0.135	0.014	-0.133
	p-value	0.007**	0.777	0.009**
	Upper 95% CI	-0.037	0.113	-0.034
	Lower 95% CI	-0.231	-0.085	-0.228

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

Table 3.1.2.8.
Bayesian Pearson Correlations - Pupillometry and EMV Data across all Videos

		Pup. - LA/NV	*Pup. LA/LV*	*Pup. - HA/HV*
EM - HA/HV	Pearson's r	-0.383	-0.02	-0.05
	BF_{10}	1.250e +14	0.067	0.102
EM - LA/LV	Pearson's r	-0.012	-0.056	-0.01
	BF_{10}	0.091	0.12	0.09
EM - LV/NV	Pearson's r	-0.135	0.014	-0.133
	BF_{10}	2.257	0.066	1.984

Table 3.1.2.9.
Pearson Correlations - Pupillometry and EMV Data for Men across all Videos

		Pup. - LA/NV	*Pup. LA/LV*	*Pup. - HA/HV*
EM - LV/NV	Pearson's r	0.02	0.128	0.07
	p-value	0.777	0.075	0.33
	Upper 95% CI	0.16	0.264	0.209
	Lower 95% CI	-0.12	-0.013	-0.071
EM - LA/LV	Pearson's r	0.214	-0.256	0.023
	p-value	0.035	0.011*	0.825
	Upper 95% CI	0.397	-0.06	0.221
	Lower 95% CI	0.015	-0.433	-0.178
EM - HA/HV	Pearson's r	0.072	-0.039	-0.057
	p-value	0.306	0.582	0.421
	Upper 95% CI	0.208	0.1	0.082
	Lower 95% CI	-0.066	-0.176	-0.193

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

Table 3.1.3.0.
Bayesian Pearson Correlations - Pupillomtry and EMV Data for Men across all Videos

		Pup. - LA/NV	*Pup. LA/LV*	*Pup. - HA/HV*
EM - LV/NV	Pearson's r	0.02	0.128	0.07
	BF_{10}	0.093	0.434	0.144
EM - LA/LV	Pearson's r	0.214	-0.256	0.023
	BF_{10}	1.132	2.972	0.13
EM - HA/HV	Pearson's r	0.072	-0.039	-0.057
	BF_{10}	0.148	0.102	0.121

Table 3.1.3.1.
Pearson Correlations - Pupillometry and EMV Data for Women across all Videos

		Pup. - LA/NV	Pup. LA/LV	Pup. - HA/HV
EM - LV/NV	Pearson's r	0.08	-0.162	-0.056
	p-value	0.267	0.024*	0.434
	Upper 95% CI	0.218	-0.022	0.085
	Lower 95% CI	-0.061	-0.296	-0.195
EM - LA/LV	Pearson's r	-0.074	-0.206	0.134
	p-value	0.469	0.043*	0.189
	Upper 95% CI	0.127	-0.007	0.325
	Lower 95% CI	-0.27	-0.389	-0.067
EM - HA/HV	Pearson's r	0.029	-0.1	-0.149
	p-value	0.68	0.155	0.034*
	Upper 95% CI	0.167	0.038	-0.011
	Lower 95% CI	-0.109	-0.235	-0.281

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

Table 3.1.3.2.
Bayesian Pearson Correlations - Pupillometry and EMV Data for Women across all Videos

		Pup. - LA/NV	Pup. LA/LV	Pup. - HA/HV
EM - LV/NV	Pearson's r	0.08	-0.162	-0.056
	BF_{10}	0.165	1.143	0.121
EM - LA/LV	Pearson's r	-0.074	-0.206	0.134
	BF_{10}	0.164	0.955	0.297
EM - HA/HV	Pearson's r	0.029	-0.1	-0.149
	BF_{10}	0.096	0.24	0.813

Pupillometry and Valence & Arousal Ratings

Table 3.1.3.3.
Pearson Correlations - Pupillometry and Valence and Arousal Ratings across all Videos

		A- HA/HV	*A- LA/LV*	*A - LA/NV*	*V - HA/HV*	*V - LA/LV*	*V - LA/NV*
Pup. - LA/NV	Pearson's r	0.308	0.207	-0.077	0.238	-0.005	0.243
	p-value	0.056	0.207	0.642	0.145	0.977	0.136
	Upper 95% CI	0.568	0.49	0.245	0.515	0.311	0.519
	Lower 95% CI	-0.008	-0.117	-0.383	-0.084	-0.32	-0.078
Pup. - LA/LV	Pearson's r	0.121	0.332	0.179	0.1	0.234	0.205
	p-value	0.463	0.039*	0.276	0.544	0.152	0.21
	Upper 95% CI	0.42	0.586	0.468	0.403	0.512	0.489
	Lower 95% CI	-0.202	0.018	-0.145	-0.222	-0.088	-0.118
Pup. - HA/HV	Pearson's r	-0.026	0.254	0.016	-0.279	0.276	0.259
	p-value	0.876	0.119	0.925	0.086	0.089	0.112
	Upper 95% CI	0.292	0.527	0.329	0.04	0.544	0.531
	Lower 95% CI	-0.339	-0.067	-0.301	-0.546	-0.043	-0.062

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

Table 3.1.3.4.
Bayesian Pearson Correlations - Pupillometry and Valence and Arousal Ratings across all Videos

		A- HA/HV	*A- LA/LV*	*A - LA/NV*	*V - HA/HV*	*V - LA/LV*	*V - LA/NV*
Pup. - LA/NV	Pearson's r	0.308	0.207	-0.077	0.238	-0.005	0.243
	BF_{10}	1.154	0.43	0.221	0.555	0.199	0.583
Pup. - LA/LV	Pearson's r	0.121	0.332	0.179	0.1	0.234	0.205
	BF_{10}	0.258	1.555	0.353	0.238	0.536	0.426
Pup. - HA/HV	Pearson's r	-0.026	0.254	0.016	-0.279	0.276	0.259
	BF_{10}	0.202	0.645	0.2	0.829	0.805	0.674

Table 3.1.3.5.
Pearson Correlations - Pupillometry and Valence and Arousal Ratings for Men across all Videos

		A- HA/HV	*A- LA/LV*	*A - LA/NV*	*V - HA/HV*	*V - LA/LV*	*V - LA/NV*
Pup. - HA/HV	Pearson's r	0.622	0.575	0.731	0.374	0.162	0.192
	p-value	0.188	0.233	0.099	0.465	0.76	0.716
	Upper 95% CI	0.953	0.945	0.968	0.91	0.86	0.868
	Lower 95% CI	-0.383	-0.444	-0.199	-0.628	-0.748	-0.734
Pup. - LA/LV	Pearson's r	-0.638	-0.921	-0.778	0.591	-0.403	-0.434
	p-value	0.173	0.009**	0.068	0.216	0.428	0.39
	Upper 95% CI	0.359	-0.435	0.091	0.948	0.607	0.583
	Lower 95% CI	-0.955	-0.992	-0.974	-0.423	-0.915	-0.921
Pup. - LA/NV	Pearson's r	0.677	0.103	0.156	0.394	0.438	-0.031
	p-value	0.139	0.846	0.768	0.44	0.385	0.953
	Upper 95% CI	0.961	0.844	0.859	0.913	0.922	0.801
	Lower 95% CI	-0.298	-0.773	-0.751	-0.614	-0.58	-0.822

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

Table 3.1.3.6.
Bayesian Pearson Correlations - Pupillometry and Valence and Arousal Ratings for Men across all Videos

		A- HA/HV	*A- LA/LV*	*A - LA/NV*	*V - HA/HV*	*V - LA/LV*	*V - LA/NV*
Pup. - HA/HV	Pearson's r	0.622	0.575	0.731	0.374	0.162	0.192
	BF_{10}	1.031	0.906	1.538	0.62	0.512	0.52
Pup. - LA/LV	Pearson's r	-0.638	-0.921	-0.778	0.591	-0.403	-0.434
	BF_{10}	1.086	7.013	1.948	0.946	0.646	0.677
Pup. - LA/NV	Pearson's r	0.677	0.103	0.156	0.394	0.438	-0.031
	BF_{10}	1.24	0.499	0.51	0.637	0.682	0.492

Table 3.1.3.7.
Pearson Correlations - Pupillometry and Valence and Arousal Ratings for Women across all Videos

		A- HA/HV	*A- LA/LV*	*A - LA/NV*	*V - HA/HV*	*V - LA/LV*	*V - LA/NV*
Pup. - HA/HV	Pearson's r	0.103	0.23	0.103	-0.042	0.159	-0.017
	p-value	0.57	0.197	0.568	0.818	0.377	0.927
	Upper 95% CI	0.431	0.531	0.431	0.306	0.476	0.329
	Lower 95% CI	-0.25	-0.123	-0.249	-0.38	-0.195	-0.358
Pup. - LA/LV	Pearson's r	0.011	-0.226	-0.333	-0.131	-0.072	-0.162
	p-value	0.953	0.206	0.058	0.468	0.692	0.367
	Upper 95% CI	0.353	0.127	0.011	0.222	0.279	0.192
	Lower 95% CI	-0.334	-0.528	-0.607	-0.454	-0.405	-0.479
Pup. - LA/NV	Pearson's r	0.167	-0.006	0.173	-0.182	0.103	0.132
	p-value	0.352	0.975	0.335	0.311	0.567	0.463
	Upper 95% CI	0.483	0.338	0.487	0.172	0.431	0.455
	Lower 95% CI	-0.187	-0.348	-0.181	-0.494	-0.249	-0.221

Table 3.1.3.8.
Bayesian Pearson Correlations - Pupillometry and Valence and Arousal Ratings for Women across all Videos

		A- HA/HV	*A- LA/LV*	*A - LA/NV*	*V - HA/HV*	*V - LA/LV*	*V - LA/NV*
Pup. - HA/HV	Pearson's r	0.103	0.23	0.103	-0.042	0.159	-0.017
	BF_{10}	0.253	0.48	0.253	0.222	0.315	0.217
Pup. - LA/LV	Pearson's r	0.011	-0.226	-0.333	-0.131	-0.072	-0.162
	BF_{10}	0.217	0.466	1.211	0.279	0.233	0.32
Pup. - LA/NV	Pearson's r	0.167	-0.006	0.173	-0.182	0.103	0.132

BF_{10}	0.328	0.217	0.338	0.354	0.253	0.28