

**ASSESSING CHANGES IN SEXUAL ATTRACTIONS**

**LUCAS WALTERS**

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in partial Fulfillment of the requirements for the  
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School of Psychology  
Faculty of Social Science  
University of Ottawa

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**Author's Declaration Page**

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## Abstract

Sexual attraction is an important component of sexual orientation and is linked to people's sexual identity and behaviour. Emerging research, typically with samples of women, finds that people experience changes over time in the genders to which they are sexually attracted. Theories and clinical applications related to sexual fluidity continue to be developed based on findings that describe changes in gender-based sexual attractions. But people are sexually attracted to targets/acts beyond men and women. The extent of change in sexual attraction over time to targets/acts beyond gender has not been studied. The goal of this research program is to describe the extent of such changes by developing and using a measure of self-reported sexual attraction (i.e., the Sexual Attractions Inventory; SAI) toward diverse targets/acts over multiple time points. The research questions addressed are (1) how much change is observed in sexual attractions over time, (2) is the SAI a reliable and valid measure of sexual attraction, and (3) what is the extent of change to diverse targets/acts generally and between biographic groups? A three-part sequential research program was conducted. This program began with a systematic review of the literature on changes in sexual attractions, finding that among 15 unique samples, sexual attractions change for almost a fifth of participants. Following this, a measure development and psychometric evaluation study was conducted with a sample of 670 university students, resulting in the use of the SAI to detect change in sexual attraction to 40 items over six months. Finally, a one-year longitudinal study was conducted using an online sample of 2,000 international participants. Effect sizes of change, reliable change indices, and group-based trajectory modeling were used to analyze the data at three time points. The results of this dissertation indicate that some people experience changes in their sexual attractions over time, but stability is common. When people experienced a change, its magnitude varied by target/act

(i.e., different changes between normophilic and paraphilic targets/acts) and biographic factors (i.e., gender, age, and sexual orientation of the rater). These findings have both theoretical and clinical implications, which are further discussed.

## Preface

This dissertation is composed of five chapters. Chapters 1 and 5 represent the General Introduction and General Discussion, respectively, and are intended to guide the reader and orient them to the existing research on changes in sexual attractions and related concepts. Chapters 2, 3, and 4 are written in the form of scientific reports and prepared to meet common publication standards. Below, the publication status of each of these chapters is discussed, alongside the accompanying citations. The role of co-authors is also specified. The general format, language, and referencing style adhere to the standards and guidelines of the peer-reviewed journals where each report is published, submitted, or intended to be submitted. Each report concludes with references, tables, figures, and supplemental materials. All published reports were co-authored with supervisor Martin Lalumière. Dr. Lalumière contributed to the study planning, resourcing, and editing of all work included within this dissertation. Because the empirical chapters are written as articles for publication and therefore stand alone, there is some repetition of content across chapters.

Chapter 2 was published in *The Canadian Journal of Human Sexuality* in February 2025. This publication was co-authored by two undergraduate volunteer research assistants, Ms. Elena N. McCluskie and Ms. Mathilde Roberge, as well as an undergraduate honours student, Ms. Sara Moazami. All three students assisted with the coding of articles included in the systematic review. Each student was assigned a section of the articles to review; I reviewed *all* the articles and served as the primary coder. Each student also participated in the final review and minor editing of the article. Mr. Patrick Labelle, a social sciences librarian at the University of Ottawa, is acknowledged for his support in developing a search strategy. Dr. Michael Seto is acknowledged for his consultation in the study's conceptualization.

## Chapter 2:

Walters, L., McCluskie, E. N., Roberge, M., Moazami, S., & Lalumière, M. L. (2024) A systematic review of changes in sexual attractions. *Canadian Journal of Human Sexuality* aop, e20240030. DOI: [10.3138/cjhs-2024-0030](https://doi.org/10.3138/cjhs-2024-0030)

Chapter 3 is currently under review and consideration for publication by *Psychology & Sexuality* as of July 2025. The study was reviewed and approved by the University of Ottawa's Health Sciences and Sciences Research Ethics Board (H-11-22-8614; see Appendix A). This publication had no other co-authors beyond Dr. Lalumière, and I. Dr. Michael Seto is acknowledged for his consultation, review, and support in the development of this project. I acknowledge and thank Dr. Cousineau for his support in developing the code to run a novel effect size formula in R. I also acknowledge Ms. Julia Felgner for her review and double-checking of the data screening.

## Chapter 3:

Walters, L., & Lalumière, M. L. (2025). Psychometric Evaluation of a Novel Measure of Sexual Attraction: The Sexual Attraction Inventory. *Psychology & Sexuality* (Submitted).

Chapter 4 is being prepared for publication pending feedback from the dissertation review committee. The study was reviewed and approved by the University of Ottawa's Health Sciences and Sciences Research Ethics Board (H-09-23-9621; see Appendix B). There are no co-authors beyond Dr. Lalumière and I. I intend to acknowledge my committee members: Drs. Michael Seto, Serena Corsini-Munt, Elisa Romano, and Lisa Diamond for their review and suggestions to improve this work prior to its submission to an academic journal.

Overall, I acknowledge the support provided by the Social Sciences and Humanities Research Council of Canada and the Ontario Graduate Scholarship.

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I have been blessed with a supervisor whose favorite pastime is reading, because I produced many drafts and worked hard to improve my writing throughout this program of research. I am very thankful to my supervisor, Dr. Martin Lalumière, for his support in developing my scholarly skills. I admire his academic rigour, wit, and well-placed humour. I have learned a lot about the “Martinisms” that characterize his signature style, and I surely kept him busy with my own “Lucasisms”. Thank you, Martin, for believing in my potential and giving me what I needed to produce this work. I will consistently remind myself of what I have learned from you.

While I have worked diligently and passionately on my dissertation, I have also had my moments of being stubborn, preoccupied, overwhelmed, and have tended to let my anxious thoughts run amok. I needed my village to get through. This dissertation would not have happened without my family, inherited and chosen, encouraging me, supporting me, and keeping me accountable. Throughout the years, I have made countless connections that have helped me endure. Old friends were left, new friends were made. Some connections employed me, others offered late-night words of wisdom, pushing me to think deeper about my work. Countless cups of coffee were brewed by baristas who offered words of encouragement and support. I cannot name you all, but I am forever in your debt.

Some names stick out to me that I would like to acknowledge more explicitly. Thank you to Mom, Dad, Reilly, Matt, Karle, Kailey (x2), Enya, Tessa, Justine, Mounica, Shayan, Ashley, Isabelle, and Jordyn.

## **Dedication**

To my grandfather, Darrell Walters. I wish you were here to see me soar, but I am thankful for the wings you helped me grow.

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## **Chapter 1: General Introduction**

Sexual attractions are an important part of people's lives. To illustrate, the development of sexual attractions is a marker of human pubescence (McClintock & Herdt, 1996); sexual attractions can make or break friendships (Halatsis & Christakis, 2009); psychotherapists worry about being sexually attracted to their clients (Giovazolias & Davis, 2001; Ladany et al., 1997); sexual attractions can get people excommunicated from their faith communities (Jacobsen & Wright, 2014); some people report feeling no sexual attraction at all and wonder what that means (Gupta, 2017; Yule et al., 2017); others worry their strong and persistent attractions could lead to legal consequences or leave them on the periphery of society (Schaefer et al., 2023). But what are sexual attractions, and how do they develop across the lifespan? Over time, sexual attractions may shift among partners, sexual acts, objects, or contexts. Yet, there are significant gaps in our understanding of what sexual attractions are and what happens to them over time.

This dissertation begins by synthesizing the academic literature about the stability and fluidity of sexual attractions (Chapter 2). Stemming from this review, a survey instrument to measure people's sexual attractions is developed and psychometrically evaluated (Chapter 3); Using this instrument, I survey a large online community sample thrice over one year and evaluate the size and prevalence of changes in sexual attraction to diverse targets/acts (Chapter 4). But first, what are sexual attractions, and why might they change?

### **What are Sexual Attractions?**

Sexual attractions have been defined and measured inconsistently by researchers. McClelland et al. (2016) wrote that our current body of research lacks a basic understanding of the phenomenology of sexual attraction. Some researchers believe that sexual attractions are independent of sexual identity/behaviors; some do not (Dickson et al., 2013; Johns et al., 2013; Savin-Williams, 2014). Some researchers view sexual and romantic attractions as the same;

some do not (Harris et al., 2019; Scheller et al., 2024; Thompson & Morgan, 2008). Some researchers define sexual attraction in terms of magnitude (magnitude of attraction; Rosario et al., 2008), while others do not (e.g., frequency of attraction; Bos et al., 2008; age of first known attraction; Dunne et al., 2000).

McClelland et al. (2016) are not the first, nor the most recent, to call for more cohesion in the research on sexual attractions. For example, Le Moëne et al. (2018) discussed the lack of an operational definition of sexual attraction in their review of the neuroendocrinology of sexual attraction in rodents and non-human primates. Coulaud et al. (2024) discussed the limitations of current research on sexual fluidity and make the specific recommendation for future researchers to develop more precise measures of sexual attraction. Katz-Wise and Todd (2022) discussed the need for more research to define, conceptualize, and measure sexual attraction in their opinion-based review of sexual fluidity research.

One way of determining a definition of sexual attraction would be to examine well-cited studies of human sexuality. This, however, does not provide the clarity or precision needed to define sexual attraction. Consider, for example, the Capilano Suspension Bridge study, one of the most-cited studies with sexual attraction in its title (Dutton & Aron, 1974). In this study, Canadian participants supposedly experienced sexual attraction when in an anxiety-inducing environment. Sexual attraction was, however, defined as sexual arousal and was measured using the Thematic Apperception Test (Murray, 1943). Participants were exposed to an anxiety-inducing environment (i.e., crossing a suspension bridge), viewed an image of a person covering their face, and were then asked to write a narrative about the image. The participants' responses were coded based on the presence of any sexual content (e.g., "the girl in the image wants to be held and kissed"), which supposedly indicated sexual arousal. The title of their seminal paper

made no mention of sexual arousal but inferred that the study was on sexual attraction.

Alternatively, one could turn to large-scale studies to glean how sexual attraction is defined. Robust studies like the National Survey of Family Growth (NSFG; Centres for Disease Control and Prevention, 2021), the National Surveys of Sexual Attitudes and Lifestyles (NATSAL; Mitchell et al., 2012), or the Youth Risk Behaviour Surveys (YRBS; Brener et al., 2013) all collect data on sexual attraction in large samples of participants. Reviewing these studies would leave one with the notion that sexual attraction is solely about the gender to whom you are attracted. In short, sexual attraction in these studies is exclusively about whether one is attracted to men/boys, women/girls, or both.

Indeed, it is common for researchers to restrict sexual attraction to gender targets (e.g., Chandra et al., 2013; Johns et al., 2013; Su & Zheng, 2022; Timmins et al., 2021). This gender-focused conceptualization of sexual attraction is seen among older studies (e.g., Kinsey et al., 1998) and more recently published studies (e.g., Keinan-Bar et al., 2024), and among Western (e.g., Diamond, 2016; Petit et al., 2023) and Eastern research as well (e.g., Su & Zheng, 2022; Vasey et al., 2007). Yet, people are sexually attracted to targets/acts beyond genders.

The study of paraphilias (or atypical sexual attraction) diverges from the focus on gender because paraphilias involve sexual attractions to different age groups (i.e., chronophilias; Money, 1986), objects (e.g., chairs or bridges; Simner et al., 2019), specific acts/behaviors (e.g., rubbing against a nonconsenting person; Långström, 2010), and internal feelings or self-expressions (e.g., adults role-playing and assuming the identity of a baby; Hsu & Bailey, 2023). Research on paraphilias does not typically use gender-based definitions of sexual attraction in its conceptualization of this construct. No currently published definition of sexual attraction could be used by researchers interested in sexual attraction to gender and other diverse or atypical

sexual targets/acts concurrently.

### **A Proposed Definition of Sexual Attraction**

In this research program (and as introduced below in Chapter 2), I define sexual attraction as *an orienting response to a stimulus (persons, attributes, contexts, acts, etc.) that generates sexual states (e.g., sexual behaviours, arousal, fantasy, or interest)*. In developing this definition, I used knowledge from modern theories of how human sexuality could change (sexual fluidity; Diamond, 2008) and how sexual attraction relates to other components of human sexuality (Sexual Configurations Theory; van Anders, 2015). There are several unique features of this definition: (1) It encompasses all stimuli to which one may be attracted, (2) it differs from other related constructs in human sexuality (e.g., sexual arousal), and (3) it proposes a link between sexual stimuli and the states elicited by these stimuli.

The first feature of this definition is that it describes sexual attraction as an orienting response to a broad array of stimuli. As discussed, researchers typically focus on *who* someone is sexually attracted to, and primarily to sex or gender attributes. However, people report sexual attraction to diverse stimuli (e.g., robots, leather, scents, whips, bedrooms, strangers, and personality traits). As an example, Hsu (2019) collected data from 334 adults reporting sexual attraction to anthropomorphic animals, 148 adults reporting sexual attraction to adult diapers, and 75 adults sexually attracted to the idea of being a eunuch (i.e., someone who has had their testes removed).

Reports of sexual attraction to diverse stimuli are also observed in the non-scientific literature. Pygmalion was sexually attracted to his statue (Carr, 1960). In Victor Hugo's *The Hunchback of Notre Dame* (1879), a young Quasimodo is described as having such an intense attraction to a large copper bell that it is likened to the attraction between Romeo and Juliet. In

2007, American citizen Erika LaBrie married the object of her sexual attraction, the Eiffel Tower, and adopted the name Erika Eiffel (Piotrowska, 2018). Modern American television shows like TLC's *My Strange Addiction* frequently depict individuals with atypical sexual attractions to cars, balloons, and buildings (Violet Media, 2025).

A second feature of the proposed definition of sexual attraction is that it distinguishes it from related but dissimilar constructs in human sexuality research. Notably, this definition separates sexual attraction from sexual orientation, which is used to describe someone's sexuality across multiple dimensions (e.g., sexual attraction, sexual behavior, sexual identity; Rosario & Schrimshaw, 2014; van Anders, 2015). This separation allows for a more precise conceptualization of sexual attractions.

The proposed definition also differs from sexual arousal, which is a motivational state brought on by an internal or external stimulus and includes the process of physiological response and subjective arousal (Bancroft, 2005). Where sexual attraction is more passive (representing continuous, cumulative responses formed by innate and learned experience; Abé, 2025) and indirectly preparatory (whereby sexual attraction generates sexual states that may consequently lead to sexual preparedness), sexual arousal is active (i.e., a triggered temporary state with greater variability in responsivity) and directly preparatory (directly prepares the individual for sexual behavior). It is likely that sexual attraction and arousal interact or share characteristics and mechanisms of action. However, the proposed definition attempts to clarify what sexual attraction is, separate from other constructs like sexual arousal.

To further illustrate these differences, a man may identify and express/label his sexual orientation as straight (i.e., a heterosexual sexual orientation) but is sexually attracted to both men and women, particularly in the context of group sex. Furthermore, he may be sexually

attracted to something like group sex, as he tried it once in high school and had a pleasurable experience, but when engaging in group sex again, he may not experience any arousal at all. This could be for several reasons (e.g., stressful environments suppressing the arousal response). Yet, his sexual attraction to group sex and associated sexual feelings may persist and still live within a heterosexual sexual orientation.

A third feature of the proposed definition of sexual attraction is that it differentiates sexual attraction from other sexual states that attraction may generate (e.g., sexual fantasy, desire, drive, interest; Scheller et al., 2023). This differentiation is important for researchers interested in isolating sexual attraction as a variable in study designs and separating its phenomenology from other related constructs. Similar to sexual arousal, sexual attraction likely shares features with the states it generates (e.g., sexual fantasy, desire, drive, and interest), but this definition is a guide for future researchers to separate them and study sexual attraction more effectively.

Firstly, sexual fantasy can be distinguished in that it is defined as thoughts that have sexual meaning for someone (Dawson et al., 2012; Sierra et al., 2006). A single definition of sexual desire (sometimes referred to as sexual wanting) is hard to agree upon. Sexual desire was first conceptualized in literature through the work of Sigmund Freud, who postulated that all psychological forces were products of two main drives: Eros, the force of sexuality and life, and Thanatos, the force of death (as per Spector et al., 1996). Since this conceptualization, sexual desire has become more empirically defined and studied, but in diverse ways. Some, like Spector et al. (1996), define sexual desire as an interest in sexual activity. Others view sexual desire as including both sexual fantasy and the desire to engage in sexual behaviors (Brotto & Smith, 2014). Sexual desire is often conflated with the terms *libido* or *sexual drive* (which refers to the

strength of sexual motivation; Baumeister et al., 2001). In studying how sexual drive and attraction converge (or not) in self-reports, Lippa (2006) has suggested that sexual drive is a generalized energizer for sexual attraction, which may motivate sexual desire for someone or something. Lastly, sexual interest is often used to refer to positive cognitive appraisals (e.g., thoughts or sex-related fantasies) that are sexual in nature and relate to planned behaviour (DeLamater et al., 2017).

Building upon the previous example, a man may report a strong sexual attraction to group sex, but he may also report spending no time at all fantasizing about this. The man does not experience sexual fantasy related to group sex but would still endorse sexual attraction to group sex when asked. He may scroll through dating applications and organize a group sex encounter only to find that he is experiencing little to no sexual desire for group sex. He may be tired, have negative appraisals of the benefits of engaging in group sex, or may generally lack the sexual drive to engage in the behavior.

In the above example, this man is experiencing low sexual desire and drive simultaneously with sexual attraction as they relate to group sex. He still considers pursuing this in the future, perhaps when he is experiencing more sexual desire, but he maintains more positive than negative thoughts and ideas about it, expressing his sexual interest. By exploring the nuances and overlap between these concepts in human sexuality, we can begin to understand better the unique ways we can conceptualize and define sexual attraction. Defining sexual attraction, however, is only the first step in understanding how sexual attractions may change across our lives.

### **How Might Sexual Attractions Change?**

Researchers have proposed hypotheses and theories to explain how sexual attractions

change with time. “Change” in this sense includes the development of new sexual attractions, and the strengthening/weakening and extinguishment of existing ones. Some researchers, like Diamond and colleagues (2019), define change in multiple ways and compare “types” of change. For example, Diamond and colleagues propose four types of sexual fluidity in attractions:

(1) fluidity as overall erotic responsiveness to one’s less-preferred gender, (2) fluidity as situational variability in erotic responsiveness to one’s less-preferred gender, (3) fluidity as discrepancy between the gender patterning of sexual attractions and the gender patterning of sexual partnering, and (4) fluidity as instability in day-to-day attractions over time. (pp. 2389)

The present program of research considers change in its most parsimonious quantitative form: a difference between scores over time, represented as an absolute value.

Although no single theory exists to explain how diverse sexual attractions change (or do not change), there is value in considering research from different schools of thought and perspectives. This may also inform novel research questions about whether different mechanisms and variables influence the adoption of new sexual attractions versus modifying or extinguishing existing ones. Using a biopsychosocial approach, I briefly review biological, psychological, and social factors that may influence changes in sexual attractions.

### ***Biological Theories of Change***

Biological-based hypotheses and theories of sexual attraction are typically reported within broader studies of sexual orientation. The origins of same-sex attraction have long puzzled researchers who seek to explain this attraction based on neural, hormonal, genetic, and immunological mechanisms. This focus on sexual orientation and same-sex attraction typically involves questions of how sexual attractions develop, with less attention paid to how they change

in intensity over time.

Earlier biological research questions examined the role of adrenarche and the “magic age of 10” being when humans develop sexual attraction (McClintock & Herdt, 1996). Herdt (2010) went so far as to suggest that understanding the development of sexual attraction through adrenarche represents the “key to our thinking about the interaction of nature and culture in human development” (pp. 357). Indeed, pubescent adolescents spend a significant amount of time thinking about sexuality and attraction (Fortenberry, 2013). However, sexual attractions change in older age groups as well (e.g., Diamond, 2000), suggesting other biological mechanisms that might influence such changes.

Wang et al. (2019) reviewed the research on biological mechanisms only to conclude that the development of sexual attractions (as a component of sexual orientation) is complex and warrants further research. The authors review hypotheses involving steroid hormones (e.g., Bao & Swaab, 2011; van Hemmen et al., 2017), brain structure (e.g., Poepl et al., 2016; Taziaux et al., 2016), handedness and morphometrics (e.g., Lalumière et al., 2000; Skorska et al., 2015), genetics (e.g., Harden, 2014; Sanders et al., 2017), and epigenetics (e.g., Rice et al., 2013). These hypotheses mostly rely on correlational evidence between biological phenomena (e.g., left-handedness) and sexual attraction. The review by Wang et al. reflects the literature in that we have many studies and hypotheses, but few theories of the biological mechanisms that change the strength or targets of sexual attractions.

For the studies that do propose biological theories of sexual attraction, most seek to explain how sexual attractions come to be, and less attention is given to how sexual attractions change. Some may argue that this makes sense; we often want to understand how something comes to be before understanding where it goes. For example, the dopaminergic reward system

is a well-studied system that influences our engagement with pleasurable activities. As has been proposed before (e.g., Acevedo & Aron, 2014), this reward system may play a key role in how we choose sexual partners and activities. Acevedo and Aron (2014) suggested that dopamine may be related to who and what people are sexually and romantically interested in. Alternatively, Le Moëne and Ågmo (2018), in their review of the neuroendocrinology of sexual attraction literature, concluded that while there is evidence to suggest dopamine plays a role in general arousal, it is not likely to play a determinative role in sexual response (inclusive of attraction). They suggested that the focus on dopamine, one of the most studied neurotransmitters in sexual attraction literature, has been insufficient to help us understand *how* we are sexually attracted to various targets.

Continuing with dopamine as an example, the biological research on human sexual attraction has encountered other challenges in understanding *how* we are sexually attracted (and how sexual attractions change). Most researchers study sexual attraction using animal models and focus on behavior changes (e.g., the time one rat spends near another, as reviewed by Melis et al., 2022). Recently, Melis et al. (2022) reviewed the literature on dopamine, sexual function, and sexual behavior in males. They reported that most studies reviewed were with rodent models, and they found converging evidence that specific dopaminergic receptors (i.e., D<sub>2</sub> and D<sub>4</sub>) facilitate dopamine's effect on sexual responsiveness, specifically on penile erection.

Melis et al. (2022) did not study sexual attraction, but the focus on animal modeling and behavior change is seen in the literature on sexual attraction as well. The review by Le Moëne and Ågmo (2018) focused on sexual attraction and potential neurotransmitters that may influence attraction. They exclusively cited research done with animal models that infer sexual attraction from approach-related behaviors (e.g., one rodent sniffing the genitals of another; Hawcock et

al., 2010). Little research exists to examine how dopamine may (or may not) influence changes in human sexual attractions (Brom et al., 2014).

Expanding beyond hypotheses related to dopamine, neuroendocrinological research on sexual attraction is dominated by non-human animal models that focus on observable changes (e.g., erection). As noted by Melis et al. (2022), this has paid off in the past; many current treatments of human sexual dysfunction were informed by rodent models. Indeed, the review by Melis et al. could inform the development of new pharmaceutical interventions for people experiencing erectile dysfunction. However, there are major differences between how rodents and humans respond to neuroendocrinological changes (as reviewed in Ågmo & Laan, 2022; Melis et al., 2022). The cost of focusing on animal models and physical change has been that we have few (and newly emerging) biological theories of how sexual attractions change in humans.

One of the most recent hypotheses comes from Yang et al. (2020), who used a randomized control design to study the effect of kisspeptin on male sexual attraction. Kisspeptin is a peptide hormone implicated in pubertal development and the general modulation of sex steroids (Trevisan et al., 2018). Yang et al. hypothesized that kisspeptin would enhance our ability to feel attraction, particularly when processing visual or olfactory cues. They tested this with a randomized, double-blind, two-way crossover, placebo-controlled study of 33 heterosexual men.

In their study, Yang et al. (2020) administered intravenous kisspeptin up to a level demonstrating the dose was biologically active (i.e., when intravenous kisspeptin increased luteinizing hormone levels). The control group was given an equal-dose placebo (vehicle). During injection and post-injection, participants were given questionnaires (e.g., the Sexual Quality of Life Questionnaire; Abraham et al., 2008; the Sexual Desire Inventory 2; Spector et

al., 1996; the International Index of Erectile Function; Rosen et al., 1997) and underwent functional magnetic resonance imaging (fMRI). All participants were given olfactory cues (e.g., popular perfume validated at baseline) and visual cues (faces of women of varying attractiveness from a validated database) and rated their feelings of attraction and attractiveness. Yang et al. reported that participants who received kisspeptin infusions showed increased brain activity within olfactory and limbic systems compared with the placebo group. The specific neural pathways affected were those associated with the production of sexual behaviors and perceptions of beauty. Additionally, men who reported a lower sexual quality of life showed greater brain activity in these regions in response to kisspeptin than other men. They concluded that kisspeptin and the related effects may represent an undescribed mechanism of human sexual attraction and warrant further investigation.

Collectively, these biological hypotheses and theories are insufficient to explain how sexual attractions change. Significant progress has been made in understanding various biological correlates of sexual attraction, but we still know very little about the role of biology in how sexual attractions develop. Even less is known about the role of biology in explaining how sexual attractions change.

### ***Psychological Theories of Change***

Psychologically based hypotheses and theories of change in sexual attraction have largely focused on learning, conditioning, and the incentive theory of motivation (Logan, 1968; Smid & Wever, 2019; Toates, 2009). Learning is the process of acquiring knowledge through experience that results in a behavior change (e.g., De Houwer et al., 2013), while conditioning is a more specific learning process where we learn about relations between events or stimuli (e.g., Hoffman, 2017). Learning and conditioning help us understand our world and increase our

ability to predict future events accurately.

Human sexual conditioning has been studied empirically for at least the past 60 years (Hoffmann, 2017). Researchers have studied how various conditioning paradigms (e.g., classical conditioning, operant conditioning) influence sexual responses and sexual interests (see Hoffman, 2012; Hoffman, 2017; Lalumière & Quinsey, 1998). As discussed in Hoffman's review (2017), much of this research has studied male sexuality, happens in laboratory settings, and often results in an effect size that is not considered to be robust.

For example, Lalumière and Quinsey (1998) had 10 male participants view 11 pairings of images of moderately attractive women (that the men rated before the trial) with videos of explicit sexual interactions. They also had 10 other participants view the images of attractive women without the videos. Sexual arousal was measured via penile plethysmography (i.e., changes in penile circumference). They found that the men who experienced pairings had an increase in sexual arousal to the images of approximately 10% compared with the group that had just viewed the images. However, it is unclear how generalizable these conditions are outside of laboratories. While this is just one example of the challenges with demonstrating sexuality-based conditioning in research, the theory of learning and conditioning might still help us understand how sexual attractions change.

The more we experience something (e.g., sexual arousal), the more we pair this experience with other relevant and concurrent stimuli (e.g., the flirting with a sexual partner that motivated sexual arousal), and the more we can update our knowledge about what we are sexually aroused to (Abé, 2025). In line with hypotheses related to sexual arousal (e.g., Roche & Barnes-Holmes, 2002), as we pair stimuli (e.g., feet, penetrative sex, perfume) with sexual gratification or pleasure (e.g., orgasm), we reinforce positive psychological appraisals of these

stimuli. These stimuli are then given increasingly sexual labels and reinforce our attraction and seeking of these stimuli (Pfaus et al., 2001). Someone with an attraction to feet may trace this attraction back to a first particularly positive sexual experience with feet (e.g., feeling a partner's feet during foreplay and before orgasm; Ventriglio et al., 2019). With time and pairing, this attraction may strengthen or weaken depending on rewards (e.g., pleasurable experiences with feet) or punishments (e.g., experiencing shame for socially undesirable or culturally taboo behaviors).

Furthermore, the incentive theory of motivation may help us understand how sexual attractions change. This theory holds that we orient ourselves towards stimuli that incentivize our motivation to act (e.g., Ågmo & Laan, 2022; Killeen, 1982; Smid & Wever, 2019). This theory differs from learning and conditioning in that it explicitly involves a cognitive, evaluative process whereby we decide whether something is worth pursuing based on incentive and motivation. The value, or how incentivizing something is, changes with time and can be influenced by learning and conditioning.

The incentive theory of motivation can be applied to many of our behaviors. For example, I may want to walk with my partner because we will get ice cream back home. I know that I love ice cream, and it is a worthy reward for a 30-minute walk, so I decided to go for a walk. If my partner decides, upon leaving, that we won't be getting ice cream, I will re-evaluate my decision to go on the walk. I may decide to go still because the exercise would be nice, or the sunshine would be relaxing, or I may stay home because I am not sufficiently motivated. Alternatively, we may go for a walk and get ice cream, but the ice cream makes me sick. In this example, I may update my knowledge of how incentivizing ice cream is, which may not be motivating enough to convince me to take a walk the following day.

This example could also be explained using the principles of learning and conditioning. Indeed, learning and conditioning still allow people to update their knowledge based on experiences (e.g., not going for walks if the ice cream starts making them sick). Still, it does not directly include evaluating if something is incentive enough to motivate behavior to occur. Both theories still point to a similar concept; we are likely to pursue something more when it has an outcome that we perceive to be rewarding.

Sex can result in several rewarding outcomes, including orgasm. When we achieve these rewards, their benefits (e.g., pleasure, bonding, stress relief) may motivate us to seek methods to achieve this again (Meston & Buss, 2007). The incentive to seek out sex is likely to activate approach behaviors (Hernández-González et al., 2008). The type and intensity of these approach behaviors may be heavily influenced by how *attractive* the reward is. Smid and Weaver (2019) have proposed a model of sexual motivation that explains this clearly. They propose that when we are not pulled towards other important activities that require our attention (e.g., satiating hunger), we are predisposed to be attuned to stimuli that could signal sexual reward. Such detection would activate neural circuitry to alert us to the possibility of sexual reward (e.g., the dopaminergic system), which would motivate approach behaviors towards attractive stimuli. Rewarding experiences with these stimuli would reinforce our motivation to detect and seek them out in the future. The more we reinforce this motivational cycle, the more likely we are to seek more sexually arousing stimuli and experience decreasing inhibition.

Smid and Weaver's (2019) proposition is a succinct, clear, and theory-based model of sexual motivation. Their work includes sexual attraction and how sexual attractions may change based on incentives and motivations. I would, however, argue that it underplays the role of sexual attraction. Smid and Weaver discussed how the sexual motivation cycle pulls us towards

sexually attractive stimuli, but it does not directly comment on where this attraction comes from or how it may change.

A sexually attractive stimulus is not the same as a stimulus that someone has sexual attraction for. Sexual attractiveness is the adjective that describes how appealing a stimulus is to *most* people (Townsend & Wasserman, 1997). For example, a group of heterosexual women may agree that Taylor Swift (a popular singer/celebrity) is sexually attractive, but they may all report having no sexual attraction to this person. Smid and Weaver (2019) discussed how stimulus attractiveness can be determined by the individual (e.g., what people personally are attracted to) or by culture and society (e.g., body hair; Dixson et al., 2019). Despite this differentiation in their introduction, both their model and their defining terms only mentioned “sexually attractive” stimuli. Some people may interpret “sexually attractive” as something they personally find attractive (e.g., their romantic partner), and others may interpret this as what the majority finds sexually attractive (e.g., Taylor Swift). Smid and Weaver’s model of sexual motivation does not differentiate what someone is attracted to versus what someone thinks others are attracted to.

There is likely a considerable overlap between what we are sexually attracted to and what we find sexually attractive, and thus, inferences can be made about how Smid and Weaver’s model can inform us of how sexual attractions may change as a product of motivation. For example, if someone is sexually attracted to having sex in the back of a car since it has been rewarding for them in the past (e.g., many orgasms in that context), their attractions may shift if they start to have negative sexual experiences. Perhaps they lose access to a car, or perhaps they have a sexual encounter in a car that leaves them feeling uncomfortable. Following this, the incentive to have sex in a car decreases. They may start to see sex in the bedroom as more rewarding, and the target of their sexual attractions may change.

Learned experience likely shapes the degree of sexual attraction someone holds toward a specific stimulus. This hypothesis is included in Abé's (2025) recent theoretical model of sexual attraction. In this model (see Figure 5 of Abé, 2025), both innate (e.g., genetic predispositions) and learned factors (e.g., previous experience) contribute to the individual's evaluation of sexual attraction via prior knowledge ("sexual priors"). These sexual priors are mental images that function as cognitive reference points for a person to evaluate their sexual attraction to a specific stimulus. This model also accounts for the influence of memory in the sexual attraction evaluation process. Abé's theoretical model takes a more specific approach than classic learning or motivation models and includes several psychological and biological processes that may shape how one determines the magnitude and composition of sexual attraction. It would be interesting for future research to measure the various components of this model longitudinally to determine how suitable it is for explaining psychological mechanisms of change in sexual attractions.

### ***Social Theories of Change***

Social factors may also influence changes in sexual attractions. LaTorre (1980) demonstrated that, when faced with social rejection in sexual relationships, heterosexual men were more likely to rate images of women more negatively (e.g., less *attractive*, less pleasant) than those without histories of rejection. This seems to suggest that there are interpersonal dynamics that may influence the targets of our sexual attractions. Belu and O'Sullivan (2025) study change in sexual attractions among romantic partners and theorize that the quality of a relationship and the presentation of alternative partners can shift the magnitude of attraction one experiences toward specific people. These studies all suggest that how we feel and relate to others plays a role in the target and intensity of our sexual attraction.

Diamond (2008) has exemplified this through her hypotheses of sexual attraction and

love. As women develop stronger emotional bonds with others, interpersonal love may facilitate or alter sexual attractions. In her longitudinal study, Diamond noted that when women experienced changes in sexual attractions, the reason was often a change in love interest.

Diamond is not the only researcher who pointed to the relationship between love and sexual attraction. Sexual attraction and love have also been explored in Martijn and colleagues' (2020) survey of 306 men, recruited online, who reported being sexually attracted to children. They reported that most of these men (72%) had also fallen in love with a child at some point. They also reported that men in their study who reported more attraction to children than to adults had 2.67 greater odds of loving a child than those who reported equal attractions to both children and adults. However, it remains unclear whether sexual attraction fosters love, if love promotes sexual attraction, or if there exists a bidirectional connection between the two constructs.

In an earlier study, Kaplan and Keys (1997) studied the social determinants of sexual attractions in mixed-sex friendships. They reported results like what Diamond later qualitatively reported (among women): love significantly predicted sexual attraction among people. More love shared between friends was associated with more reported sexual attraction. Kaplan and Keys also reported that liking a friend did not predict reported sexual attraction, highlighting the unique role that love plays in the interpersonal development of sexual attraction. Although this does not explain sexual attractions in everyone (e.g., some people identify as asexual yet still have a deep love for partners, or vice versa), it does offer insight into the social factors that may contribute to changes in our sexual attractions.

Another social factor to consider in studying how sexual attractions change is sexual identity. Sexual identity is the way we organize and understand our sexuality in a way that makes sense for ourselves and others. Sexual identity often includes the use of labels that are shared

with others to confer this information succinctly (e.g., gay, queer, straight, heteroflexible; Dillon et al., 2011). The labels used and the ways people present their sexuality in social settings have practical implications for how they are perceived, understood, and treated by others. This is not new, and research on sexual identity has focused on its links to harassment, violence, and social isolation (e.g., Garofalo et al., 1998; Jackman et al., 2020; Peterson et al., 2021).

There is evidence to suggest that, for some, sexual attraction and sexual identity develop and change independently. Draganic (2013) conducted several qualitative and quantitative studies using a sample of 128 bisexual women (117 of whom were American, with some representation from Canada, Australia, and New Zealand). As participants reported their sexual attractions, Draganic asked them to recall their sexual attractions to men/women/both at age 20, 21, and 30. Participants were between 30 and 73 years old at the time of testing, with a median age of 38. Draganic calculated changes between the three time points and slotted participants into one of four groups: stable/no fluidity, minimal fluidity, moderate fluidity, and significant fluidity. Most participants exhibited some degree of fluidity ( $n = 82$ ; 64%), which can be broken down into 30% showing minimal fluidity, 33% showing moderate fluidity, and 1% showing significant fluidity. A total of 36% of participants did not experience fluidity in these self-reports. Stability appeared to be common. These results should be interpreted within the context of participants providing retrospective reports of their attractions in the (distant) past. Some participants in this study would have recalled their attractions from over 50 years ago and were asked to delineate between gender-based attractions and orientations experienced just a year apart (e.g., from age 20 to 21).

Draganic then proceeded to map these groups of stability and fluidity in sexual attractions onto the four stages of Bradford's model of bisexual identity (see Bradford, 2004). These stages

are not currently supported by empirical literature but represent a theoretical linear progression of how bisexual people come to solidify their sexual identity. The first stage is conceptualized as the pressure to identify as either hetero- or homosexual, the second as being comfortable with sexual orientation labels, the third as participation in the sexually diverse community, and the fourth as advocacy related to sexual diversity issues. Neither of the groups of stability/fluidity was related to participants' responses to where they were in the development of their bisexual identity. This suggests that sexual attractions develop independently (to some degree) of sexual identity.

Overall, there is sufficient evidence across social hypotheses and theories to hypothesize that sexual attractions change, to some degree, because of social factors. This also makes sense considering that people's sexual attractions often reference other people (e.g., being attracted to people of a specific gender or age). It would be interesting for future research to track changes in social factors (e.g., identity labels, relationship quantity/quality) alongside changes in sexual attractions. Further, it would be valuable to explore cultural differences in changes in sexual attraction (e.g., international samples from diverse sociocultural groups) to explore more macro-level social factors that may influence fluidity (Eastwick, 2013).

### **Changes in Atypical Attractions**

Not all sexual attractions are common. Few studies have assessed sexual attraction to diverse stimuli; most have measured sexual arousal, which is likely comparable to and predictive of sexual attraction (e.g., Blanchard et al., 2012; Singer, 1984; Suschinsky et al., 2017). As an example of how uncommon some sexual attractions might be, sexual arousal toward feces (scatophilia) may only be reported by less than a single percent of people (e.g., Dawson et al., 2016; 0.6% of men from a Canadian sample of 305 and 0.1% of women from a sample of 710).

Sexual attraction to feces would likely follow a similar pattern of prevalence and gender differences. These sexual attractions that are not commonly reported amongst the public are often referred to as atypical sexual attractions, or paraphilias.

The atypical attraction that is the most studied is pedophilia. Pedophilia, the sexual attraction towards prepubescent children, can be diagnosed as a paraphilic disorder (as per Pedophilic Disorder in the DSM-5-TR; American Psychiatric Association, 2022). Pedophilia as a paraphilia has been proposed to be a sexual age orientation and is prevalent in cisgender men who have committed sexual crimes against children (Seto, 2012). Seto (2009; 2017) has suggested a prevalence rate of pedophilia of approximately 1% in the general population.

Researchers have attempted to understand how a pedophilic attraction (or pedophilic interest, as is most commonly studied) can develop and change across the lifespan. For many people with pedophilic interests, their fantasies and interests have an early age onset and remain stable for long periods without intervention or criminal offense (Grundmann et al., 2016). Tozdan and Briken (2015) have suggested, in their interviews with 75 German men (20 – 70 years old) with self-reported interest in pubescent children, that their average age of onset was 17 years old, with some reporting an onset at the early age of six years. Sexual attraction to pubescent children likely follows a comparable pattern, but this has not been directly studied.

The stability of pedophilic attractions has been challenged by Müller et al. (2014), who reported, in a sample of 43 Canadian men diagnosed with pedophilic disorder, that between two phallometric assessments six months apart, nearly half the men ( $n = 21$ ) had shifted from larger penile responses to child stimuli to larger responses to adult stimuli. Lalumière (2015) and others (e.g., Bailey, 2015; Cantor, 2015) critiqued the methodology used in that study, calling into question the validity of their phallometric testing protocol, the lack of information about

measurement sensitivity and specificity, the misunderstanding of  $z$ -scores, and a regression to the mean as an alternative explanation for the results. Overall, research has yet to change the prevailing opinion that pedophilia is stable throughout the life course.

It has been suggested that atypical sexual interests may change differently from typical sexual interests (e.g., differing age of onset and lifetime patterns in sexual interests; Tozdan & Briken, 2015; 2020). This is likely true of sexual attractions as well. The research here is limited, perhaps due to the stigma associated with studying this topic, the stigma associated with reporting this information in a study, or the difficulty in accessing participants. It would be valuable to have more direct comparisons of changes in sexual attraction to typical and atypical targets/acts to make more informed inferences about the nature of changes in paraphilia broadly.

Harvey and Jeglic (2020) reported that atypical sexual *fantasies* seem to change across the lifespan, decreasing in frequency with time, whilst normative fantasies remain stable. This finding comes from a cross-sectional study of 318 nonoffending American males, divided into age groups (i.e., 18–30 years, 31–50 years, 51–76 years). The age groups were compared based on what types of fantasies (normative or atypical) the participants reported. Older age groups reported fewer atypical sexual fantasies. This generates an interesting hypothesis that there is a negative or decreasing trend in sexual fantasy as a function of age. For example, the mean score (on a 5-point Likert scale of how often participants fantasize about an item) for atypical sexual fantasies was 0.35 for the 18–30-year group, 0.34 for the 31–50-year group, and 0.23 for the 51–76-year group. This trend was not seen among normative fantasies, which showed a curvilinear pattern of mean scores: 1.08, 1.15, and 1.04 for the respective age groups. Notably, the authors have left the definition of normative fantasy unclear. Cohort effects are also possible here, and a longitudinal study would more adequately address the question of change as a function of age.

## **How Are Sexual Attractions Measured?**

Various methodologies have been used to assess sexual attractions (Keinan-Bar et al., 2024). Some methods are used by researchers to indirectly evaluate sexual attractions via a proxy such as sexual arousal (e.g., plethysmography; Prause & Janssen, 2006; Sawatsky et al., 2021), visual attention (e.g., eye-tracking; Israel & Strassberg, 2009; Quinsey et al., 1996), or through rapid cognitive associations (e.g., implicit association tasks; IATs; Babchishin et al., 2013; Cvencek et al., 2010). Although each method has its strengths and limitations, the self-report method may be the most suitable measure to capture the breadth and depth of sexual attractions, especially in longitudinal surveys of large samples.

### ***Advantages of Using Self-Report Measures***

Self-report measures can identify many aspects of what one is sexually attracted to and are relatively easy to administer to large groups of participants. One advantage to using the self-report method is that it is less invasive than other methods, such as plethysmography (which involves the physiological measurement of blood flow through genital areas). From a large survey ( $n = 1,032$ ), Dawson et al. (2019) reported differences in Canadians who participated in sexuality research based on gender, sexual attraction, and other sociodemographic variables. These variables were related to what types of studies people signed up for (e.g., men were more likely than women to participate in psychophysiology studies) and the perceived invasiveness of the studies. Dawson et al. concluded that the number of people willing to participate was inversely related to study invasiveness. The self-report method is the least invasive of the potential measurement options (e.g., plethysmography, eye-tracking, IAT) and would likely engage more participants than other methods.

Other results from the Dawson et al. (2019) study highlight the advantages of using the

self-report method. Not only is the self-report method less invasive than others, but it has the greatest chance of engaging volunteers, regardless of gender or gender-based sexual attractions. The researchers found that self-report surveys were the only measure for which men and women were equally likely to volunteer (98% of men and 99% of women). Furthermore, it was the only method that people, regardless of their sexual attraction to same- or other-genders, were equally likely to volunteer for (98% other-gender attracted volunteers and 99% same-gender attracted volunteers). This is important to consider because there are other individual differences associated with willingness to participate in sexuality research. Indeed, those who participate in sexuality research are more sexually experienced and hold more liberal sexual attitudes or values compared to the general population (Wiederman, 1999). Self-report, however, is not without its limitations and considerations in practical use.

### ***Limitations of Using Self-Report Measures***

Response bias is one pervasive issue and potential limitation of self-reporting. For example, social desirability may influence participants' responses (Kreitchmann et al., 2019); participants may respond in ways that buffer social judgment (e.g., when reporting pedophilic attractions) or garner social support (e.g., by reporting common sexual attractions of the majority group). The self-report method is flexible in that it can be adapted to measure and control for the limitation of socially desirable responding, at least partially. The most direct way of adjusting for socially desirable responses is to provide anonymity or confidentiality to participants (Larson, 2019). These accommodations can reduce participants' worry or fear of being personally identified and connected to their responses. Additionally, using honest and plain language in the survey's introduction increases the assurance of confidentiality/anonymity for participants (Larson, 2019). Lastly, by including a validated measure of socially desirable responding (e.g.,

Marlowe-Crowne Scale; Crowne & Marlow, 1960), we can better understand the impact of social desirability and remove some of its influence in the analyses.

A second limitation of the self-report method is that it requires participants to rely on cognitive functions. Researchers must be wary of the various introspective errors that participants could make in their self-reports. Items that ask participants to rely more on cognitive functions such as memory or decision-making may increase the likelihood of participants reporting responses that are not entirely accurate (e.g., asking participants for information 20 years ago instead of 20 days ago: Mega & Volz, 2014). Indeed, adjustments can still be made to maximize the value of using the self-report method. One adjustment is to word items so that they are only asking participants to respond based on current information in lieu of retrospective information. By asking participants to rate their current sexual attractions, they are less likely to rely on memory retrieval and, thus, less susceptible to the errors that commonly occur in the retrieval process. Additionally, one can include response options in self-report measures that are worded and written with accessible language. Doing so increases the chances that participants understand what is being asked and respond accordingly.

### ***Current Self-Report Measures of Sexual Attraction***

Self-report measures of sexual attraction have a long history of being intertwined with measures of sexual orientation. One of the most common self-reported measures of sexual attraction is the Kinsey scale (Kinsey et al., 1948). This scale asks participants to assign a numbered value along a scale of sexual attraction toward women and men (-3 to 0 to +3 in some versions, or 0 to 6 in others). The measure was first (and still commonly) used to assess a participant's sexual orientation along a continuum ranging from heterosexual to bisexual to homosexual. Fusing sexual attraction with sexual orientation is common in research using self-

report as exemplified by measures like the Quebec Youth Risk Behaviour Survey (with added items as per Igartua et al., 2009), the Relationship Rating Form (and the adaptation made by Kaplan and Keys; Davis, 2001; Davis & Todd, 1982; Kaplan & Keys, 1997), the Sexual Fluidity Grid (Draganic, 2017), and the Sexual Attraction Questionnaire (Féernandez et al., 2006), which all define sexual attraction in terms of gender- or partner-preferences.

There has not been significant development in the measurement of sexual attraction beyond the Kinsey framework of asking about partner gender preferences. In the third edition of the *Handbook of Sexuality-Related Measures* (Fisher et al., 2013), the authors listed only one measure of sexual attraction: *Assessing Multiple Facets of Attraction to Men and Women* (Diamond, 2010). This measure captures components of partner preference, describing the attractions people hold towards others based on gender and the frequency with which they have had sexual encounters with people of varying genders. The most recent version of the *Handbook of Sexuality-Related Measures* (Milhausen et al., 2019) has removed the chapter on sexual attraction and does not include any measure specifically capturing the content of one's sexual attractions.

Some measures have been developed to evaluate constructs like sexual attraction beyond gender preference. The Explicit Sexual Interest Questionnaire (ESIQ), for example, measures participants' interest in various sexual behaviors with specific partners (Banse et al., 2010). The ESIQ asks participants to select yes/no responses to 10 prompts across four categories (e.g., men, women, boys, and girls) to describe the age and gender of a preferred partner and various sexual acts they would be interested in engaging in (i.e., oral sex with a young woman). This measure thus concurs with the proposed conceptualization of sexual attraction as being more than just gender-based attractions. However, the ESIQ exclusively measures sexual behaviors enacted in

the past (e.g., I have sexually caressed a woman) and current sexual interests and fantasies. It does not include a direct focus on sexual attraction. Furthermore, with only 10 prompts per category and yes/no responses, the measure is very limited in breadth and depth of assessment.

Measures used to capture paraphilic interests and arousal have considered incorporating diverse targets outside of just gender preference. A measure like the Paraphilia Scale (PS; Chivers et al., 2014; Seto et al., 2012) is a contemporary example of the integration of multiple targets into a single measure. The Paraphilia Scale (Chivers et al., 2014; Seto et al., 2012) includes Likert scale options, is relatively brief (40 items), and asks about sexual arousal to several types of stimuli. One concern with the scale is that it uses a bipolar scale, with *very repulsive* on one pole (i.e., -3) and *very arousing* (i.e., +3) on the other. As mentioned, sexual arousal is an excitatory state brought on by an internal or external stimulus and includes the process of physiological response (as adapted from Bancroft, 2005). Repulsion can be described as an inhibitory state and is characterized by distaste or disgust. It is unclear whether these two states can be placed on a single dimension.

Fleischman et al. (2015) differentiated sexual arousal from disgust in an experimental paradigm. In this study, 76 women rated their disgust before or after watching pornographic films. In addition to ratings of disgust, the researchers measured women's sexual arousal using vaginal plethysmography. In different conditions (e.g., disgust measured before pornography vs. disgust measured after), there were different relations between disgust and arousal. In the pornography-before-disgust condition, sexual arousal did not directly predict ratings of disgust. In the disgust-before-pornography condition, disgust and sexual arousal were negatively correlated, whereby greater disgust was related to lower sexual arousal.

The negative correlation between sexual arousal and disgust has also been reported by

other researchers (e.g., Andrews et al., 2015; Oaten et al., 2019). One hypothesis often raised for the negative correlation focuses on an adaptation to avoid the risk of disease transmission. If we are exposed to things that induce disgust (e.g., signs of potential disease), we are less motivated to engage sexually. This adaptation preserves our health and safety as well as our potential offspring.

Another explanation for why sexual arousal and disgust may not lie on a single dimension has to do with social influences. Both sexual arousal and disgust have been associated with socialization, or the process of learning to behave in socially desirable/acceptable ways (sexual arousal; Laan & Janssen, 2007; disgust; Tybur et al., 2018). In short, there is correlational evidence to suggest that sexual arousal is influenced by gendered norms and stereotypes that are socially learned and internalized (Laan & Janssen, 2007). Disgust, on the other hand, is a phenomenon that children may learn from their parents. This has been evidenced by children not typically showing disgust until late-toddler years and positive correlations between offspring and parents on measures of disgust sensitivity (as per Tybur et al., 2018).

Regardless of the reason, sexual arousal and disgust are likely distinct but related. The Paraphilia Scale (Chivers et al., 2014; Seto et al., 2012) measures responses using both constructs, making the scale multidimensional despite the measure being designed only to measure sexual arousal. As discussed in Study 2 of this research program, the framework of the Paraphilias Scale may be adapted to capture sexual attraction specifically, with some adjustments made to the response options.

### **Clinical Relevance**

Changes in sexual attractions are clinically relevant. The first reason to discuss, and perhaps the one with the most apparent relevance, is that clinical psychologists assess and

diagnose conditions directly related to sexual attractions (e.g., pedophilic disorder; American Psychiatric Association, 2022). However, the field of clinical psychology is also working through two additional relevant situations: the ethics associated with conversion therapy, and sexual attraction between therapists and their clients.

In 2020, the Government of Canada tabled an amendment to the Criminal Code, Bill C-6, the ban on conversion therapy (Bill C-6: An Act to Amend the Criminal Code, 2021). The Department of Justice stated in the bill that the ban would apply to therapies aimed at reducing non-heterosexual sexual attractions. Although this ban is supported by research on the harms and ethical concerns of conversion therapy (e.g., American Psychological Association, Task Force on Appropriate Therapeutic Responses to Sexual Orientation, 2009; Andrade & Redondo, 2022), it does not cite any literature on whether human sexual attractions can change (or how they change). As discussed, the academic literature on the stability of sexual attractions over time is sparse. As the field of clinical psychology continues to contend with the ethics and practice of therapies designed to shift people's attractions, there is a significant lack of data about how or if sexual attractions naturally fluctuate with time. Further, it could be valuable to understand if people experience psychological distress (or relief) with such fluctuations and if there exists a relationship between changes in sexual attractions and changes in psychological health.

Clinical psychology also continues to grapple with how therapists manage sexual interests and attractions to clients (Gewirtz-Meydan et al., 2024; Stefana & Youngstrom, 2024). Bersen et al. (1994) sent questionnaires about sexual attraction to clients to an American sample of 1,000 nationally registered social workers. Of this sample, 444 returned the questionnaires with information about sexual attractions. More therapists ( $n = 361$ ; 81%) reported sexual attractions to clients than not ( $n = 83$ ; 19%). Subsequently, Giovazolias and Davis (2001) sent

questionnaires about sexual attractions to 286 counseling psychologists in the British Psychological Society. Only 122 questionnaires were returned to the researchers for analysis. They found that many psychologists ( $n = 95$ ; 78%) reported at least one instance of sexual attraction to a client.

Less research has been published in the late 2000s on this topic, but what does exist has shown much the same results. Vesentini et al. (2022) mailed questionnaires to psychotherapists in Belgium with a response rate of 40% ( $n = 786$ ). Their results replicated much of what has been previously reported; the majority (71%) reported some degree of sexual attraction to a client or that they found a client sexually attractive. Furthermore, about 3% of psychotherapists reported having had a sexual relationship with clients.

Research across these decades shows us that sexual attractions are an important consideration for therapists and their clients. Much like with conversion therapy, as clinical psychologists contend with unwanted sexual attractions, there is little research on how or if these attractions shift naturally with time. Thus, knowing more about the general nature of changes in sexual attractions could assist future research to investigate specific instances of unwanted sexual attractions and how to best support therapists in such positions.

### **Research Objectives**

The broad goal of the present research program is to describe the presence and extent of changes in many different (i.e., diverse) sexual attractions (e.g., toward genders, ages, objects, situations). The main research questions designed to meet this goal are: (1) based on current literature, how much change (if any) is observed in sexual attractions over time, (2) is the SAI a reliable and valid measure of sexual attraction, and (3) what is the extent of change (if any) to diverse stimuli generally and between biographic groups? A three-part sequential research

program is described to address these questions. It consists of (1) a systematic review of the literature on changes in sexual attractions (Chapter 2), (2) a measure development and psychometric evaluation study among a sample of 670 university students (Chapter 3), and (3) a one-year longitudinal study of a sample of 2,000 international participants (Chapter 4). In this third study, I also evaluate whether changes in sexual attractions differ among men, women, and diverse gender identities, and as a function of the raters' age and sexual orientation. These findings are aggregated and integrated in the discussion of current theory and clinical practice in a General Discussion (Chapter 5).

## References

- Abé, C. (2025). The concept of innate sexual priors in the brain: A theory on why we are attracted to what we are attracted to. *Sexuality & Culture*, 29, 636–666.  
<https://doi.org/10.1007/s12119-024-10290-4>
- Abraham, L., Symonds, T., & Morris, M. F. (2008). Psychometric validation of a sexual quality of life questionnaire for use in men with premature ejaculation or erectile dysfunction. *Journal of Sexual Medicine*, 5, 595–601. <https://doi.org/10.1111/j.1743-6109.2007.00749.x>
- Acevedo, B. P., & Aron, A. P. (2014). Romantic love, pair-bonding, and the dopaminergic reward system. In M. Mikulincer & P. R. Shaver (Eds.), *Mechanisms of social connection: From brain to group* (pp. 55–69). American Psychological Association.  
<https://doi.org/10.1037/14250-004>
- Ågmo, A., & Laan, E. (2022). Sexual incentive motivation, sexual behavior, and general arousal: Do rats and humans tell the same story? *Neuroscience & Biobehavioral Reviews*, 104595.  
<https://doi.org/10.1016/j.neubiorev.2022.104595>
- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.; DSM-5-TR®). American Psychiatric Association.  
<https://doi.org/10.1176/appi.books.9780890425787>
- American Psychological Association, Task Force on Appropriate Therapeutic Responses to Sexual Orientation. (2009). *Report of the American Psychological Association Task Force on Appropriate Therapeutic Responses to Sexual Orientation*. Retrieved from <http://www.apa.org/pi/lgbcc/publications/therapeutic-resp.html>

- Andrade, G., & Redondo, M. C. (2022). Is conversion therapy ethical? A renewed discussion in the context of legal efforts to ban it. *Ethics, Medicine and Public Health*, 20, 100732. <https://doi.org/10.1016/j.jemep.2021.100732>
- Andrews, A. R., Crone, T., Cholka, C. B., Cooper, T. V., & Bridges, A. J. (2015). Correlational and experimental analyses of the relation between disgust and sexual arousal. *Motivation and Emotion*, 39, 766–779. <https://doi.org/10.1007/s11031-015-9485-y>
- Babchishin, K. M., Nunes, K. L., & Hermann, C. A. (2013). The validity of Implicit Association Test (IAT) measures of sexual attraction to children: A meta-analysis. *Archives of Sexual Behaviour*, 42, 487–499. <https://doi.org/10.1007/s10508-012-0022-8>
- Bailey, J. M. (2015). A failure to demonstrate changes in sexual interest in pedophilic men: Comment on Müller et al. (2014). *Archives of Sexual Behaviour*, 44, 249–252. <https://doi.org/10.1007/s10508-014-0338-7>
- Bancroft, J. (2005). The endocrinology of sexual arousal. *Journal of Endocrinology*, 186, 411–427. <https://doi.org/10.1677/joe.1.06233>
- Banse, R., Schmidt, A. F., & Clarbour, J. (2010). Indirect measures of sexual interest in child sex offenders: A multimethod approach. *Criminal Justice and Behavior*, 37, 319–335. <https://doi.org/10.1177/0093854809357598>
- Bao, A. M., & Swaab, D. F. (2011). Sexual differentiation of the human brain: relation to gender identity, sexual orientation and neuropsychiatric disorders. *Frontiers in Neuroendocrinology*, 32, 214–226. <https://doi.org/10.1016/j.yfrne.2011.02.007>
- Baumeister, R. F., Catanese, K. R., & Vohs, K. D. (2001). Is there a gender difference in strength of sex drive? Theoretical views, conceptual distinctions, and a review of relevant

evidence. *Personality and Social Psychology Review*, 5, 242–273.

[https://doi.org/10.1207/S15327957PSPR0503\\_5](https://doi.org/10.1207/S15327957PSPR0503_5)

Belu, C. F., & O’Sullivan, L. F. (2025). It’s just a little crush: Attraction to an alternative and romantic relationship quality, breakups and infidelity. *Journal of Sex Research*, 62(4), 515-528. <https://doi-org.proxy.bib.uottawa.ca/10.1080/00224499.2024.2310702>

Bernsen, A., Tabachnick, B. G., & Pope, K. S. (1994). National survey of social workers' sexual attraction to their clients: Results, implications, and comparison to psychologists. *Ethics & Behavior*, 4, 369–388. [https://doi.org/10.1207/s15327019eb0404\\_4](https://doi.org/10.1207/s15327019eb0404_4)

Bill C-6: An Act to Amend the Criminal Code (Conversion Therapy). (2021). 1st Reading Oct. 5, 2020, 43rd Parliament, 2nd session. Retrieved from the Parliament of Canada website: <https://lop.parl.ca/staticfiles/PublicWebsite/Home/ResearchPublications/LegislativeSummaries/PDF/43-2/43-2-C6-E.pdf>

Blanchard, R., Kuban, M. E., Blak, T., Klassen, P. E., Dickey, R., & Cantor, J. M. (2012). Sexual attraction to others: A comparison of two models of alloerotic responding in men. *Archives of Sexual Behavior*, 41, 13-29. <https://doi.org/10.1007/s10508-010-9675-3>

Bos, H. M., Sandfort, T. G., De Bruyn, E. H., & Hakvoort, E. M. (2008). Same-sex attraction, social relationships, psychosocial functioning, and school performance in early adolescence. *Developmental Psychology*, 44, 59. <https://doi.org/10.1037/0012-1649.44.1.59>

Bradford, M. (2004). The bisexual experience: Living in a dichotomous culture. *Journal of Bisexuality*, 4, 7–23. [https://doi.org/10.1300/J159v04n01\\_02](https://doi.org/10.1300/J159v04n01_02)

- Brener, N. D., Kann, L., Shanklin, S., Kinchen, S., Eaton, D. K., Hawkins, J., & Flint, K. H. (2013). Methodology of the youth risk behavior surveillance system—2013. *Morbidity and Mortality Weekly Report: Recommendations and Reports*, *62*, 1–20.
- Brom, M., Both, S., Laan, E., Everaerd, W., & Spinhoven, P. (2014). The role of conditioning, learning and dopamine in sexual behavior: A narrative review of animal and human studies. *Neuroscience & Biobehavioral Reviews*, *38*, 38–59.  
<https://doi.org/10.1016/j.neubiorev.2013.10.014>
- Brotto, L. A., & Smith, K. B. (2014). Sexual desire and pleasure. In D. L. Tolman, L. M. Diamond, J. A. Bauermeister, W. H. George, J. G. Pfaus, & L. M. Ward (Eds.), *APA handbook of sexuality and psychology, Vol. 1: Person-based approaches* (pp. 205–244). American Psychological Association. <https://doi.org/10.1037/14193-008>
- Cantor, J. M. (2015). Purported changes in pedophilia as statistical artefacts: Comment on Müller et al., (2014). *Archives of Sexual Behaviour*, *44*, 253–254.  
<https://doi.org/10.1007/s10508-014-0343-x>
- Carr, J. L. (1960). Pygmalion and the Philosophes: The animated statue in eighteenth-century France. *Journal of the Warburg and Courtauld Institutes*, *23*, 239–255.  
<https://doi.org/10.2307/750594>
- Centers for Disease Control and Prevention. (2021). *National Survey of Family Growth*.  
[https://www.cdc.gov/nchs/nsfg/index.htm?CDC\\_AA\\_refVal=https%3A%2F%2Fwww.cdc.gov%2Fnchs%2Fnsfg.htm](https://www.cdc.gov/nchs/nsfg/index.htm?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fnchs%2Fnsfg.htm)
- Chandra, A., Copen, C. E., & Mosher, W. D. (2013). Sexual behavior, sexual attraction, and sexual identity in the United States: Data from the 2006–2010 National Survey of Family

- Growth. In *International handbook on the demography of sexuality* (pp. 45–66). Dordrecht: Springer Netherlands. [https://doi.org/10.1007/978-94-007-5512-3\\_4](https://doi.org/10.1007/978-94-007-5512-3_4)
- Chivers, M. L., Roy, C., Grimbos, T., Cantor, J. M., & Seto, M. C. (2014). Specificity of sexual arousal for sexual activities in men and women with conventional and masochistic sexual interests. *Archives of Sexual Behaviour*, *43*, 931–940. <https://doi.org/10.1007/s10508-013-0174-1>
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, *24*, 349. <https://doi.org/10.1037/h0047358>
- Cvencek, D., Greenwald, A. G., Brown, A. S., Gray, N. S., & Snowden, R. J. (2010). Faking of the Implicit Association Test is statistically detectable and partly correctable. *Basic and Applied Social Psychology*, *32*, 302–314. <https://doi.org/10.1080/01973533.2010.519236>
- Davis, K. E. (2001). The relationship rating form (RRF): A measure of characteristics of romantic relationships and friendships. In J. Touliatos, B. Perlmutter, & G. Holden (Eds.), *Handbook of family measurement techniques* (2nd ed., pp. 195–197). Sage Publications.
- Davis, K. E., & Todd, M. J. (1982). Friendship and love relationships. In K. E. Davis & T. O. Mitchell (Eds.), *Advances in descriptive psychology* (Vol. 2, pp. 79–112). JAI Press.
- Dawson, S. J., Bannerman, B. A., & Lalumière, M. L. (2016). Paraphilic interests: An examination of sex differences in a nonclinical sample. *Sexual Abuse*, *28*, 20–45. <https://doi.org/10.1177/1079063214525645>
- Dawson, S. J., Huberman, J. S., Bouchard, K. N., McInnis, M. K., Pukall, C. F., & Chivers, M. L. (2019). Effects of individual difference variables, gender, and exclusivity of sexual

- attraction on volunteer bias in sexuality research. *Archives of Sexual Behaviour*, *48*, 2403–2417. <https://doi.org/10.1007/s10508-019-1451-4>
- Dawson, S. J., Suschinsky, K. D., & Lalumière, M. L. (2012). Sexual fantasies and viewing times across the menstrual cycle: A diary study. *Archives of Sexual Behaviour*, *41*, 173–183. <https://doi.org/10.1007/s10508-012-9939-1>
- De Houwer, J., Barnes-Holmes, D., & Moors, A. (2013). What is learning? On the nature and merits of a functional definition of learning. *Psychonomic Bulletin & Review*, *20*, 631–642. <https://doi.org/10.3758/s13423-013-0386-3>
- DeLamater, J. D., Weinfurt, K. P., & Flynn, K. E. (2017). Patients' conceptions of terms related to sexual interest, desire, and arousal. *Journal of Sexual Medicine*, *14*, 1327–1335. <https://doi.org/10.1016/j.jsxm.2017.09.009>
- Diamond, L. M. (2000). Sexual identity, attractions, and behavior among young sexual-minority women over a 2-year period. *Developmental Psychology*, *36*, 241. <https://doi.org/10.1037/0012-1649.36.2.241>
- Diamond, L. M. (2008). *Sexual fluidity*. Harvard University Press.
- Diamond, L. M. (2010). Assessing multiple facets of attraction to women and men. In T. D. Fisher, C. M. Davis, & W. L. Yarber (Eds.), *The handbook of sexuality-related measures* (pp. 81–84). Routledge.
- Diamond, L. M. (2016). Sexual fluidity in male and females. *Current Sexual Health Reports*, *8*, 249–256. <https://doi.org/10.4324/9781315697215-26>
- Diamond, L. M., Alley, J., Dickenson, J., & Blair, K. L. (2020). Who counts as sexually fluid? Comparing four different types of sexual fluidity in women. *Archives of Sexual*

- Behavior*, 49, 2389-2403. <https://doi-org.proxy.bib.uottawa.ca/10.1007/s10508-019-01565-1>
- Dickson, N., van Roode, T., Cameron, C., & Paul, C. (2013). Stability and change in same-sex attraction, experience, and identity by sex and age in a New Zealand birth cohort. *Archives of Sexual Behaviour*, 42, 753–763. <https://doi.org/10.1007/s10508-012-0063-z>
- Dillon, F. R., Worthington, R. L., & Moradi, B. (2011). Sexual identity as a universal process. In *Handbook of identity theory and research* (pp. 649–670). Springer. [https://doi.org/10.1007/978-1-4419-7988-9\\_27](https://doi.org/10.1007/978-1-4419-7988-9_27)
- Dixson, B. J., Rantala, M. J., & Brooks, R. C. (2019). Cross-cultural variation in women's preferences for men's body hair. *Adaptive Human Behavior and Physiology*, 5, 131–147. <https://doi.org/10.1007/s40750-019-0107-x>
- Draganic, J. (2013). Sexual fluidity and women's bisexual identity development (Doctoral dissertation). The University of North Dakota. Retrieved from <https://www.proquest.com/pagepdf/1476211090?accountid=14701>
- Dunne, M. P., Bailey, J. M., Kirk, K. M., & Martin, N. G. (2000). The subtlety of sex-atypicality. *Archives of Sexual Behaviour*, 29, 549–565. <https://doi.org/10.1023/A:1002002420159>
- Dutton, D. G., & Aron, A. P. (1974). Some evidence for heightened sexual attraction under conditions of high anxiety. *Journal of Personality and Social Psychology*, 30, 510. <https://doi.org/10.1037/h0037031>
- Eastwick, P. W. (2013). Cultural influences on attraction. *Handbook of Close Relationships*, 161–182. <https://doi.org/10.1093/oxfordhb/9780195398694.013.0008>
- Fernández, J., Quiroga, M. Á., & Rodríguez, A. (2006). Dimensionalidad de la atracción sexual. *Psicothema*, 18, 392–399.

- Fisher, T. D., Davis, C. M., & Yarber, W. L. (2013). *Handbook of sexuality-related measures*. Routledge. <https://doi.org/10.4324/9781315881089>
- Fleischman, D. S., Hamilton, L. D., Fessler, D. M., & Meston, C. M. (2015). Disgust versus lust: Exploring the interactions of disgust and fear with sexual arousal in women. *PLOS ONE*, *10*, e0118151. <https://doi.org/10.1371/journal.pone.0118151>
- Garofalo, R., Wolf, R. C., Kessel, S., Palfrey, J., & DuRant, R. H. (1998). The association between health risk behaviors and sexual orientation among a school-based sample of adolescents. *Pediatrics*, *101*, 895–902. <https://doi.org/10.1542/peds.101.5.895>
- Gewirtz-Meydan, A., Lans, O., & Reuveni, L. (2024). Lo(u)st in Therapy: Development and Psychometric Evaluation of the Therapists' Attitude toward Sexual and Erotic Feelings Scale (TASEF). *Journal of Sex & Marital Therapy*, *50*, 35–54. <https://doi.org/10.1080/0092623X.2023.2246477>
- Giovazolias, T., & Davis, P. (2001). How common is sexual attraction towards clients? The experiences of sexual attraction of counselling psychologists toward their clients and its impact on the therapeutic process. *Counselling Psychology Quarterly*, *14*, 281–286. <https://doi.org/10.1080/09515070110100974>
- Grundmann, D., Krupp, J., Scherner, G., Amelung, T., & Beier, K. M. (2016). Stability of self-reported arousal to sexual fantasies involving children in a clinical sample of pedophiles and hebephiles. *Archives of Sexual Behaviour*, *45*, 1153–1162. <https://doi.org/10.1007/s10508-016-0729-z>
- Gupta, K. (2017). What does asexuality teach us about sexual disinterest? Recommendations for health professionals based on a qualitative study with asexually identified people. *Journal of Sex & Marital Therapy*, *43*, 1–14. <https://doi.org/10.1080/0092623X.2015.1113593>

- Halatsis, P., & Christakis, N. (2009). The challenge of sexual attraction within heterosexuals' cross-sex friendship. *Journal of Social and Personal Relationships*, *26*, 919–937.  
<https://doi.org/10.1177/0265407509345650>
- Harden, K. P. (2014). Genetic influences on adolescent sexual behavior: Why genes matter for environmentally oriented researchers. *Psychological Bulletin*, *140*, 434.  
<https://doi.org/10.1037/a0033564>
- Harris, K. M., Halpern, C. T., Whitsel, E. A., Hussey, J. M., Killeya-Jones, L. A., Tabor, J., & Dean, S. C. (2019). Cohort Profile: The National Longitudinal Study of Adolescent to Adult Health (Add Health). *International Journal of Epidemiology*, *48*, 1415.  
<https://doi.org/10.1093/ije/dyz115>
- Harvey, T. A., & Jeglic, E. L. (2020). Attenuation of deviant sexual fantasy across the lifespan in United States adult males. *Psychiatry, Psychology and Law*, *27*, 246–264.  
<https://doi.org/10.1080/13218719.2020.1719376>
- Hawcock, A. B., Dawkins, T. E., & Reynolds, D. S. (2010). Assessment of 'active investigation' as a potential measure of female sexual incentive motivation in a preclinical non-contact rodent model: observations with apomorphine. *Pharmacology Biochemistry and Behavior*, *95*, 179–186. <https://doi.org/10.1016/j.pbb.2010.01.002>
- van Hemmen, J., Cohen-Kettenis, P. T., Steensma, T. D., Veltman, D. J., & Bakker, J. (2017). Do sex differences in CEOAEs and 2D:4D ratios reflect androgen exposure? A study in women with complete androgen insensitivity syndrome. *Biology of Sex Differences*, *8*, 1–10. <https://doi.org/10.1186/s13293-017-0132-z>
- Herd, G. (2010). Sex/gender, culture, and development: Issues in the emergence of puberty and attraction. In *Formative experiences: The interaction of caregiving, culture, and*

*developmental psychobiology* (pp. 356–374).

<https://doi.org/10.1017/CBO9780511711879.032>

Hernández-González, M., Guevara, M. A., & Ágmo, A. (2008). Motivational influences on the degree and direction of sexual attraction. *Annals of the New York Academy of Sciences*, 1129, 61–87. <https://doi.org/10.1196/annals.1417.010>

Hoffmann, H. (2012). Considering the role of conditioning in sexual orientation. *Archives of Sexual Behaviour*, 41, 63–71. <https://doi.org/10.1007/s10508-012-9915-9>

Hoffmann, H. (2017). Situating human sexual conditioning. *Archives of Sexual Behaviour*, 46, 2213–2229. <https://doi.org/10.1007/s10508-017-1030-5>

Hsu, K. J. (2019). Erotic target identity inversions in male furies, adult baby/diaper lovers, and eunuchs (Doctoral dissertation). Northwestern University. Retrieved from <https://www.proquest.com/docview/2276865844?pqorigsite=gscholar&fromopenview=true>

Hsu, K. J., & Bailey, J. M. (2023). Sexual orientation, sexual motivation, and erotic target identity inversions in male adult baby/diaper lovers. *Archives of Sexual Behaviour*, 52, 2385–2401. <https://doi.org/10.1007/s10508-023-02564-z>

Hugo, V., & Seaside Library Collection. (1879). *The Hunchback of Notre Dame*. G. Munro. Retrieved from the Library of Congress: <https://www.loc.gov/item/ca07005178/>

Igartua, K., Thombs, B. D., Burgos, G., & Montoro, R. (2009). Concordance and discrepancy in sexual identity, attraction, and behavior among adolescents. *Journal of Adolescent Health*, 45, 602–608. <https://doi.org/10.1016/j.jadohealth.2009.03.019>

- Israel, E., & Strassberg, D. S. (2009). Viewing time as an objective measure of sexual interest in heterosexual men and women. *Archives of Sexual Behaviour, 38*, 551–558.  
<https://doi.org/10.1007/s10508-007-9246-4>
- Jackman, K., Kreuze, E. J., Caceres, B. A., & Schnall, R. (2020). Bullying and peer victimization of minority youth: Intersections of sexual identity and race/ethnicity. *Journal of School Health, 90*, 368–377. <https://doi.org/10.1111/josh.12883>
- Jacobsen, J., & Wright, R. (2014). Mental health implications in Mormon women's experiences with same-sex attraction: A qualitative study. *The Counseling Psychologist, 42*, 664–696.  
<https://doi.org/10.1177/0011000014533204>
- Johns, M. M., Zimmerman, M., & Bauermeister, J. A. (2013). Sexual attraction, sexual identity, and psychosocial wellbeing in a national sample of young women during emerging adulthood. *Journal of Youth and Adolescence, 42*, 82–95. <https://doi.org/10.1007/s10964-012-9795-2>
- Kaplan, D. L., & Keys, C. B. (1997). Sex and relationship variables as predictors of sexual attraction in cross-sex platonic friendships between young heterosexual adults. *Journal of Social and Personal Relationships, 14*, 191–206.  
<https://doi.org/10.1177/0265407597142003>
- Katz-Wise, S. L., & Todd, K. P. (2022). The current state of sexual fluidity research. *Current Opinion in Psychology, 101497*. <https://doi.org/10.1016/j.copsyc.2022.101497>
- Keinan-Bar, S., Joel, D., & Bar-Anan, Y. (2024). A comparative investigation of indirect measures of sexual attraction. *Collabra: Psychology, 10*.  
<https://doi.org/10.1525/collabra.125184>

- Killeen, P. R. (1982). Incentive theory: II. Models for choice. *Journal of the Experimental Analysis of Behaviour*, 38, 217–232. <https://doi.org/10.1901/jeab.1982.38-217>
- Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. W. B. Saunders.
- Kinsey, A. C., Pomeroy, W. B., Martin, C. E., & Gebhard, P. H. (1998). *Sexual behavior in the human female*. Indiana University Press. <https://doi.org/10.2979/2944.0>
- Kreitchmann, R. S., Abad, F. J., Ponsoda, V., Nieto, M. D., & Morillo, D. (2019). Controlling for response biases in self-report scales: forced-choice vs. psychometric modeling of Likert items. *Frontiers in Psychology*, 10, 2309. <https://doi.org/10.3389/fpsyg.2019.02309>
- Laan, E., & Janssen, E. (2007). How do men and women feel? Determinants of subjective experience of sexual arousal. In *The Psychophysiology of Sex* (pp. 278–290).
- Ladany, N., O'Brien, K. M., Hill, C. E., Melincoff, D. S., Knox, S., & Petersen, D. A. (1997). Sexual attraction toward clients, use of supervision, and prior training: A qualitative study of predoctoral psychology interns. *Journal of Counseling Psychology*, 44, 413. <https://doi.org/10.1037/0022-0167.44.4.413>
- Lalumière, M. L. (2015). The lability of pedophilic attractions as measured by phallometry. *Archives of Sexual Behaviour*, 44, 255–258. <https://doi.org/10.1007/s10508-014-0340-0>
- Lalumière, M. L., Blanchard, R., & Zucker, K. J. (2000). Sexual orientation and handedness in men and women: a meta-analysis. *Psychological Bulletin*, 126, 575. <https://doi.org/10.1037/0033-2909.126.4.575>
- Lalumière, M. L., & Quinsey, V. L. (1998). Pavlovian conditioning of sexual interests in human males. *Archives of Sexual Behaviour*, 27, 241–252. <https://doi.org/10.1023/A:1018686817316>

- Långström, N. (2010). The DSM diagnostic criteria for exhibitionism, voyeurism, and frotteurism. *Archives of Sexual Behaviour*, *39*, 317–324. <https://doi.org/10.1007/s10508-009-9577-4>
- Larson, R. B. (2019). Controlling social desirability bias. *International Journal of Market Research*, *61*, 534–547. <https://doi.org/10.1177/1470785318805305>
- LaTorre, R. A. (1980). Devaluation of the human love object: Heterosexual rejection as a possible antecedent to fetishism. *Journal of Abnormal Psychology*, *89*, 295. <https://doi.org/10.1037/0021-843X.89.2.295>
- Le Moëne, O., & Ågmo, A. (2018). The neuroendocrinology of sexual attraction. *Frontiers in Neuroendocrinology*, *51*, 46–67. <https://doi.org/10.1016/j.yfrne.2017.12.006>
- Lippa, R. A. (2006). Is high sex drive associated with increased sexual attraction to both sexes? It depends on whether you are male or female. *Psychological Science*, *17*, 46–52. <https://doi.org/10.1111/j.1467-9280.2005.01663.x>
- Logan, F. (1968). Incentive Theory and Changes in Reward. *Journal of Psychology of Learning and Motivation*, *2*, 1–30. [https://doi.org/10.1016/S0079-7421\(08\)60420-X](https://doi.org/10.1016/S0079-7421(08)60420-X)
- Martijn, F. M., Babchishin, K. M., Pullman, L. E., & Seto, M. C. (2020). Sexual attraction and falling in love in persons with pedohebephilia. *Archives of Sexual Behaviour*, *49*, 1–14. <https://doi.org/10.1007/s10508-019-01579-9>
- McClelland, S. I., Rubin, J. D., & Bauermeister, J. A. (2016). "I liked girls and I thought they were pretty": Initial memories of same-sex attraction in young lesbian and bisexual women. *Archives of Sexual Behaviour*, *45*, 1375–1389. <https://doi.org/10.1007/s10508-015-0507-3>

- McClintock, M. K., & Herdt, G. (1996). Rethinking puberty: The development of sexual attraction. *Current Directions in Psychological Science*, 5, 178–183.  
<https://doi.org/10.1111/1467-8721.ep11512422>
- Mega, L. F., & Volz, K. G. (2014). Thinking about thinking: implications of the introspective error for default-interventionist type models of dual processes. *Frontiers in Psychology*, 5, 86. <https://doi.org/10.3389/fpsyg.2014.00864>
- Melis, M. R., Sanna, F., & Argiolas, A. (2022). Dopamine, erectile function and male sexual behaviour from the past to the present: A review. *Brain Sciences*, 12, 826.  
<https://doi.org/10.3390/brainsci12070826>
- Meston, C. M., & Buss, D. M. (2007). Why humans have sex. *Archives of Sexual Behavior*, 36, 477–507. <https://doi.org/10.1007/s10508-007-9175-2>
- Milhausen, R. R., Sakaluk, J. K., Fisher, T. D., Davis, C. M., & Yarber, W. L. (2019). *Handbook of sexuality-related measures*. Routledge. <https://doi.org/10.4324/9781315183169>
- Mitchell, K. R., Ploubidis, G. B., Datta, J., & Wellings, K. (2012). The Natsal-SF: a validated measure of sexual function for use in community surveys. *European Journal of Epidemiology*, 27, 409–418. <https://doi.org/10.1007/s10654-012-9697-3>
- Money, J. (1986). *Lovemaps: Clinical concepts of sexual/erotic health and pathology, paraphilia, and gender transposition of childhood, adolescence, and maturity*. Amherst, NY: Prometheus.
- Müller, K., Curry, S., Ranger, R., Briken, P., Bradford, J., & Fedoroff, J. P. (2014). Changes in sexual arousal as measured by penile plethysmography in men with pedophilic sexual interest. *Journal of Sexual Medicine*, 11, 1221–1229. <https://doi.org/10.1111/jsm.12488>
- Murray, H. A. (1943). *Thematic apperception test manual*. Harvard University Press.

- Oaten, M., Stevenson, R. J., Tapp, C., Case, T. I., & Cousins, A. (2019). The role of disgust in male sexual decision-making. *Frontiers in Psychology, 9*, 2602.  
<https://doi.org/10.3389/fpsyg.2018.02602>
- Peterson, Z. D., Vaughan, E. L., & Carver, D. N. (2021). Sexual identity and psychological reactions to COVID-19. *Traumatology, 27*, 6. <https://doi.org/10.1037/trm0000283>
- Petit, M. P., Blais, M., & Hébert, M. (2023). Dating violence victimization disparities across sexual orientation of a population-based sample of adolescents: An adverse childhood experiences perspective. *Psychology of Sexual Orientation and Gender Diversity, 10*, 217. <https://doi.org/10.1037/sgd0000518>
- Pfaus, J. G., Kippin, T. E., & Centeno, S. (2001). Conditioning and sexual behavior: a review. *Hormones and Behavior, 40*, 291–321. <https://doi.org/10.1006/hbeh.2001.1686>
- Piotrowska, A. (2018). Married to the Eiffel Tower: Notes on love, loss and replacement. In *On Replacement: Cultural, Social and Psychological Representations* (pp. 177–184). Cham: Springer International Publishing. [https://doi.org/10.1007/978-3-319-76011-7\\_17](https://doi.org/10.1007/978-3-319-76011-7_17)
- Poeppl, T. B., Langguth, B., Rupprecht, R., Safron, A., Bzdok, D., Laird, A. R., & Eickhoff, S. B. (2016). The neural basis of sex differences in sexual behavior: A quantitative meta-analysis. *Frontiers in Neuroendocrinology, 43*, 28–43.  
<https://doi.org/10.1016/j.yfrne.2016.10.001>
- Prause, N., & Janssen, E. (2006). Blood flow: Vaginal photoplethysmography. In I. Goldstein, C. M. Meston, S. R. Davis, & A. M. Traish (Eds.), *Women's sexual function and dysfunction: Study, diagnosis and treatment*. CRC Press. [https://doi.org/10.1201/b14618-](https://doi.org/10.1201/b14618-53)

- Quinsey, V. L., Ketsetzis, M., Earls, C., & Karamanoukian, A. (1996). Viewing time as a measure of sexual interest. *Ethology and Sociobiology*, *17*, 341–354.  
[https://doi.org/10.1016/S0162-3095\(96\)00060-X](https://doi.org/10.1016/S0162-3095(96)00060-X)
- Rice, W. R., Friberg, U., & Gavrilets, S. (2012). Homosexuality as a consequence of epigenetically canalized sexual development. *Quarterly Review of Biology*, *87*, 343–368.  
<https://doi.org/10.1086/668167>
- Roche, B., & Barnes-Holmes, D. (2002). Human sexual arousal: A modern behavioral approach. *Behavior Analyst Today*, *3*, 145. <https://doi.org/10.1037/h0099973>
- Rosario, M., Schrimshaw, E. W., & Hunter, J. (2008). Predicting different patterns of sexual identity development over time among lesbian, gay, and bisexual youths: A cluster analytic approach. *American Journal of Community Psychology*, *42*, 266–282.  
<https://doi.org/10.1007/s10464-008-9207-7>
- Rosario, M., & Schrimshaw, E. W. (2014). Theories and etiologies of sexual orientation. In D. L. Tolman, L. M. Diamond, J. A. Bauermeister, W. H. George, J. G. Pfaus, & L. M. Ward (Eds.), *APA handbook of sexuality and psychology, Vol. 1: Person-based approaches*. American Psychological Association. <https://doi.org/10.1037/14193-018>
- Rosen, R. C., Riley, A., Wagner, G., Osterloh, I. H., Kirkpatrick, J., & Mishra, A. (1997). The international index of erectile function (IIEF): A multidimensional scale for assessment of erectile dysfunction. *Urology*, *49*, 822–830. [https://doi.org/10.1016/S0090-4295\(97\)00238-0](https://doi.org/10.1016/S0090-4295(97)00238-0)
- Sanders, A. R., Beecham, G. W., Guo, S., Dawood, K., Rieger, G., Badner, J. A., Gershon, E. S., Krishnappa, R. S., Kolundzija, A. B., Duan, J., Gejman, P. V., Bailey, M. J., & Martin, E.

- R. (2017). Genome-wide association study of male sexual orientation. *Scientific Reports*, 7, 1–6. <https://doi.org/10.1038/s41598-017-15736-4>
- Savin-Williams, R. C. (2014). An exploratory study of the categorical versus spectrum nature of sexual orientation. *Journal of Sex Research*, 51, 446–453. <https://doi.org/10.1080/00224499.2013.871691>
- Sawatsky, M. L., Suschinsky, K. D., Lavrinsek, S., Chivers, M. L., & Lalumière, M. L. (2021). Can the vaginal photoplethysmograph and its associated methodology be used to assess anal vasocongestion in women and men? *Archives of Sexual Behaviour*, 50, 3865–3888. <https://doi.org/10.1007/s10508-021-02069-7>
- Schaefer, A., Wittenberg, A., Galynker, I., & Cohen, L. J. (2023). Qualitative analysis of minor attracted persons' subjective experience: Implications for treatment. *Journal of Sex & Marital Therapy*, 49, 391–411. <https://doi.org/10.1080/0092623X.2022.2126808>
- Scheller, M., de Sousa, A. A., Brotto, L. A., & Little, A. C. (2024). The role of sexual and romantic attraction in human mate preferences. *Journal of Sex Research*, 61, 299–312. <https://doi.org/10.1080/00224499.2023.2176811>
- Seto, M. C. (2009). Pedophilia. *Annual Review of Clinical Psychology*, 5, 391–407. <https://doi.org/10.1146/annurev.clinpsy.032408.153618>
- Seto, M. C. (2012). Is pedophilia a sexual orientation? *Archives of Sexual Behaviour*, 41, 231–236. <https://doi.org/10.1007/s10508-011-9882-6>
- Seto, M. C. (2017). The puzzle of male chronophilias. *Archives of Sexual Behaviour*, 46, 3–22. <https://doi.org/10.1007/s10508-016-0799-y>

- Seto, M. C., Lalumière, M. L., Harris, G. T., & Chivers, M. L. (2012). The sexual responses of sexual sadists. *Journal of Abnormal Psychology, 121*, 739.  
<https://doi.org/10.1037/a0028714>
- Sierra, J. C., Ortega, V., & Zubeidat, I. (2006). Confirmatory factor analysis of a Spanish version of the Sex Fantasy Questionnaire: Assessing gender differences. *Journal of Sex & Marital Therapy, 32*, 137–159. <https://doi.org/10.1080/00926230500442318>
- Simner, J., Hughes, J. E., & Sagiv, N. (2019). Objectum sexuality: A sexual orientation linked with autism and synaesthesia. *Scientific Reports, 9*, 19874.  
<https://doi.org/10.1038/s41598-019-56449-0>
- Singer, B. (1984). Conceptualizing sexual arousal and attraction. *Journal of Sex Research, 20*, 230-240. <https://doi.org/10.1080/00224498409551222>
- Skorska, M. N., Geniole, S. N., Vrysen, B. M., McCormick, C. M., & Bogaert, A. F. (2015). Facial structure predicts sexual orientation in both men and women. *Archives of Sexual Behaviour, 44*, 1377–1394. <https://doi.org/10.1007/s10508-014-0454-4>
- Smid, W. J., & Wever, E. C. (2019). Mixed emotions: An incentive motivational model of sexual deviance. *Sexual Abuse, 31*, 731–764. <https://doi.org/10.1177/1079063218775972>
- Spector, I. P., Carey, M. P., & Steinberg, L. (1996). The Sexual Desire Inventory: Development, factor structure, and evidence of reliability. *Journal of Sex & Marital Therapy, 22*, 175–190. <https://doi.org/10.1080/00926239608414655>
- Stefana, A., & Youngstrom, E. A. (2024). Erotic feelings towards patients in the psychotherapy session: Investigating their relationship with the characteristics of the therapist, the patient, and the treatment. *Sexual Abuse, 36*, 692–713.  
<https://doi.org/10.1177/10790632231190081>

- Su, Y., & Zheng, L. (2022). Sexual orientation and gender differences in sexual minority identity in China: Extension to asexuality. *Current Psychology, 41*, 8678–8691.  
<https://doi.org/10.1007/s12144-021-01354-x>
- Suschinsky, K. D., Dawson, S. J., & Chivers, M. L. (2017). Assessing the relationship between sexual concordance, sexual attractions, and sexual identity in women. *Archives of Sexual Behavior, 46*, 179-192. <https://doi.org/10.1007/s10508-016-0874-4>
- Taziaux, M., Staphorsius, A. S., Ghatei, M. A., Bloom, S. R., Swaab, D. F., & Bakker, J. (2016). Kisspeptin expression in the human infundibular nucleus in relation to sex, gender identity, and sexual orientation. *Journal of Clinical Endocrinology & Metabolism, 101*, 2380–2389. <https://doi.org/10.1210/jc.2015-4175>
- Thompson, E. M., & Morgan, E. M. (2008). "Mostly straight" young women: Variations in sexual behavior and identity development. *Developmental Psychology, 44*, 15.  
<https://doi.org/10.1037/0012-1649.44.1.15>
- Timmins, L., Rimes, K. A., & Rahman, Q. (2021). Is being queer gay? Sexual attraction patterns, minority stressors, and psychological distress in non-traditional categories of sexual orientation. *Journal of Sex Research, 58*, 599–611.  
<https://doi.org/10.1080/00224499.2020.1849527>
- Toates, F. (2009). An integrative theoretical framework for understanding sexual motivation, arousal, and behavior. *Journal of Sex Research, 46*, 168–193.  
<https://doi.org/10.1080/00224490902747768>
- Townsend, J. M., & Wasserman, T. (1997). The perception of sexual attractiveness: Sex differences in variability. *Archives of Sexual Behaviour, 26*, 243–268.  
<https://doi.org/10.1023/A:1024570814293>

- Tozdan, S., & Briken, P. (2015). The earlier, the worse? Age of onset of sexual interest in children. *Journal of Sexual Medicine*, *12*, 1602–1608. <https://doi.org/10.1111/jsm.12927>
- Tozdan, S., & Briken, P. (2020). Paraphilias: Diagnostics, comorbidities, and treatment. In *Psychiatry and Sexual Medicine: A Comprehensive Guide for Clinical Practitioners* (pp. 407–416). Cham: Springer International Publishing. [https://doi.org/10.1007/978-3-030-52298-8\\_27](https://doi.org/10.1007/978-3-030-52298-8_27)
- Trevisan, C. M., Montagna, E., De Oliveira, R., Christofolini, D. M., Barbosa, C. P., Crandall, K. A., & Bianco, B. (2018). Kisspeptin/GPR54 system: What do we know about its role in human reproduction? *Cellular Physiology and Biochemistry*, *49*, 1259–1276. <https://doi.org/10.1159/000493406>
- Tybur, J. M., Çınar, Ç., Karinen, A. K., & Perone, P. (2018). Why do people vary in disgust? *Philosophical Transactions of the Royal Society B: Biological Sciences*, *373*, 20170204. <https://doi.org/10.1098/rstb.2017.0204>
- van Anders, S. M. (2015). Beyond sexual orientation: Integrating gender/sex and diverse sexualities via sexual configurations theory. *Archives of Sexual Behaviour*, *44*, 1177–1213. <https://doi.org/10.1007/s10508-015-0490-8>
- Vasey, P. L., Pocock, D. S., & VanderLaan, D. P. (2007). Kin selection and male androphilia in Samoan fa'afafine. *Evolution and Human Behavior*, *28*, 159–167. <https://doi.org/10.1016/j.evolhumbehav.2006.08.004>
- Ventriglio, A., Bhat, P. S., Torales, J., & Bhugra, D. (2019). Sexuality in the 21st century: Leather or rubber? Fetishism explained. *Medical Journal Armed Forces India*, *75*, 121–124. <https://doi.org/10.1016/j.mjafi.2018.09.009>

- Vesentini, L., Van Overmeire, R., Matthys, F., De Wachter, D., Van Puyenbroeck, H., & Bilsen, J. (2022). Intimacy in psychotherapy: An exploratory survey among therapists. *Archives of Sexual Behaviour*, *51*, 453–463. <https://doi.org/10.1007/s10508-021-02190-7>
- Violet Media (production). (2025). *My Strange Addiction* [Television series]. TLC.
- Wang, Y., Wu, H., & Sun, Z. S. (2019). The biological basis of sexual orientation: How hormonal, genetic, and environmental factors influence to whom we are sexually attracted. *Frontiers in Neuroendocrinology*, *55*, 100798. <https://doi.org/10.1016/j.yfrne.2019.100798>
- Wiederman, M. W. (1999). Volunteer bias in sexuality research using college student participants. *Journal of Sex Research*, *36*, 59–66. <https://doi.org/10.1080/00224499909551968>
- Yang, L., Demetriou, L., Wall, M. B., Mills, E. G., Zargaran, D., Sykes, M., Prague, J. K., Abbara, A., Owen, B. M., Bassett, P. A., Rabiner, E. A., Comminos, A. N., & Dhillon, W. S. (2020). Kisspeptin enhances brain responses to olfactory and visual cues of attraction in men. *JCI Insight*, *5*, e133633. <https://doi.org/10.1172/jci.insight.133633>
- Yule, M. A., Brotto, L. A., & Gorzalka, B. B. (2017). Human asexuality: What do we know about a lack of sexual attraction? *Current Sexual Health Reports*, *9*, 50–56. <https://doi.org/10.1007/s11930-017-0100-y>

## **Chapter 2: A Systematic Review of Changes in Sexual Attractions**

### Abstract

Does sexual attraction to specific targets change over the lifetime? This study consisted of a systematic review and narrative synthesis of longitudinal studies published before 2022 to examine this question. A novel definition of sexual attraction was drafted to guide our search: *an orienting response to a stimulus (persons, attributes, contexts, acts, etc.) that generates sexual states (e.g., sexual arousal, fantasy, or interest)*. Studies published in English or French that reported empirical, longitudinal, and prospective data on sexual attraction were included. Of 5,475 potential studies identified, 24 met the inclusion criteria for analyses (15 independent samples of 11,943 participants). Each study was coded for descriptive statistics, definitions and measures of sexual attraction used, the period between assessments, and the number of participants who experienced any change in sexual attraction. All the included studies exclusively measured gender-based attractions; no studies assessed other targets of sexual attraction. Researchers typically did not define sexual attraction in their articles and, when they did, offered diverse definitions and conceptualizations. The Kinsey scale was the most frequently used measure of sexual attraction. In a pooled sample of 8,008 participants, 18% experienced some change in self-reported sexual attractions over a median period of approximately 20 months. These findings have implications for future research, highlighting the need for a clear definition and better measurement of sexual attraction.

*Keywords:* sexual attraction, fluidity, synthesis, review, measurement

Some gay men and lesbians experience periodic other-sex attractions, just as some heterosexuals experience periodic same-sex attraction. The word *some* is used because sexual fluidity appears to vary from person to person. Hence, certain individuals show very stable patterns of same-sex and other-sex sexual attraction over the lifespan, whereas others show variations in sexual attractions (Diamond, 2016, p. 249-250).

Indeed, some people experience changes in their sexual attractions while others do not (e.g., Diamond, 2008a). Sexual attraction is most often studied, however, as a fixed variable measured at a single time point. The academic literature on the stability and fluidity of sexual attractions over time is sparse. The prevalence, magnitude, and factors associated with stability or fluidity in people's sexual attractions are unclear (see Katz-Wise & Todd, 2022). Even less is known about changes in atypical sexual attractions (i.e., paraphilic attractions). The current study aims to systematically review the relevant literature on changes in sexual attraction.

### **Defining Sexual Attraction**

The concepts of sexual attraction and sexual orientation are often blended (Mock & Eibach, 2012; Spitzer, 2003), but the two concepts should be distinguished in that sexual attraction is one of the three components of sexual orientation; the others being sexual behavior and sexual identity (Igartua et al., 2009; Sell, 1997; van Anders, 2015). Sexual attraction has also been mingled with romantic attraction (Hu et al., 2016; Kaestle, 2019; Kassis et al., 2021; Needham, 2012), but romantic attraction is distinct from sexual attraction in that it is characterized by emotional infatuation or attachment (Diamond, 2003a; Zheng & Su, 2018).

Researchers have most often asked participants to report their sexual attraction to someone's gender (e.g., "During the past year, how sexually attracted to males (females) were you?"; Johns et al., 2013, p. 88). Sexual attraction has also been defined as the feeling associated

with a partner's gender (e.g., Chandra et al., 2013). The interest in gender-based sexual attractions is pervasive, and a focus of some of the largest and most cited studies of human sexuality. For instance, the National Survey of Family Growth (NSFG; Centres for Disease Control and Prevention, 2021) is a nationally representative sample of 22,682 men and women from the USA. The NSFG has been collecting data in cycles since 1973, much of which has been about relationships, family dynamics, and sexuality. When measuring sexual attractions, the survey asked participants to report if they are only, mostly, or equally attracted to males and females. This approach ignores the possibility of other targets of sexual attraction.

In 1986, Money coined the term *chronophilia* to describe attraction to a partner's age or stage of physical development (e.g., those attracted to pre-pubescent children would be described as having *pedophilic* attractions). As later suggested by Seto (2017), chronophilias can range from nepiophilia (sexual attraction to infants/toddlers) to gerontophilia (sexual attraction to elderly adults), but discussions of pedophilia dominate the chronophilia literature. In addition, researchers often focus on men and the risk factors associated with acting on their sexual attraction to children. Nevertheless, this line of research suggests that there are diverse targets of sexual attractions worth investigating.

Indeed, humans are sexually attracted to qualities or stimuli beyond gender or age (Bailey et al., 2016; Seto, 2017). For a few examples, humans can be sexually attracted to or interested in non-human living stimuli (e.g., animals; Earls & Lalumière, 2002, 2009; Williams & Weinberg, 2003; Zidenberg & Olver, 2022), objects such as shoes (Darcangelo, 2008; Kafka, 2010; Rees & Garcia, 2017), or corpses (Rosman & Resnick, 1989). Seto (2017) described multiple dimensions of sexual orientations and how they capture diverse targets of sexual attraction. These dimensions include *auto-allo* (self vs. others), *bios-nekro* (living vs. non-living), *anthro-zoo*

(human vs. other species), and the sexual activities dimension (e.g., dominance/submission, sadism/masochism, or consent/nonconsent). There does not appear to be, however, a definition of sexual attraction that includes the diverse stimuli that people can be sexually attracted to, making it difficult to study changes in people's various sexual attractions.

To guide this review, we propose an inclusive definition of sexual attraction: *an orienting response to a stimulus (persons, attributes, contexts, acts, etc.) that generates sexual states (e.g., sexual behaviors, arousal, fantasy, or interest)*. This definition does not include romantic or emotional attraction, which likely involves different processes and meanings (see Diamond, 2003a; Yoneda, 2010). This definition (1) encompasses any stimuli to which one may be attracted, (2) differs from other related but different constructs in human sexuality (e.g., sexual desire), and (3) makes explicit the link between sexual stimuli and the states or reactions elicited by these stimuli.

### **Measuring Changes in Sexual Attractions**

Historically, the study of sexual attraction has focused on single assessments where participants indicate whether they are currently, or in general, attracted to men or women (e.g., Bailey et al., 2000; Casey, 2022; Kinsey et al., 1948; Klein et al., 1985; Morales Knight & Hope, 2012; Savin-Williams, 2014). Participants in such studies are often asked to select a number from one to seven to indicate the degree or direction of their attractions. Some researchers have used measures with more diverse response options, but these measures are rarely used (e.g., Diamond et al., 2017; Katz-Wise & Hyde, 2015).

The most frequently used measure of sexual attraction was originally conceptualized as a measure of sexual orientation, the Heterosexual-Homosexual Rating Scale, or, as it is more commonly known, the Kinsey scale (Kinsey et al., 1948). The Kinsey scale challenged the view

that sexual orientation was binary (e.g., people were categorically either heterosexual or homosexual) and provided the foundation for subsequent continuous measures (e.g., Klein Sexual Orientation Grid [KSOG]; Klein et al., 1985). The Kinsey scale is not without its critiques – namely, it is still seen as treating sexual orientation as binary (see Sell, 1997; Zietsch & Sidari, 2020) – but it remains the most cited measure of sexual orientation. The Kinsey scale was later adapted to measure facets of sexual orientation, including sexual attraction. The Kinsey scale has been used in longitudinal studies to measure sexual attraction (e.g., Jones & Yarhouse, 2011); however, the reliability and validity of this scale in measuring change are unknown.

When studying changes in sexual attractions, some researchers used retrospective approaches (e.g., Höglund et al., 2014; Katz-Wise & Hyde, 2015; Katz-Wise et al., 2017). For example, Katz-Wise (2015) asked participants to record the number of changes in sexual attractions they had ever experienced. Other researchers have asked participants about their sexual attractions in the past, present, and future/ideal (e.g., Weinrich et al., 2014). The KSOG (Klein et al., 1985) is a measure of sexual attraction (among other sexuality-based constructs) that is often administered in a single session where participants recall sexual attractions from the past year (e.g., Clarke et al., 2015) or for their entire lives (e.g., Bockting et al., 2009). The original KSOG instruction when asking about past sexual attractions was “Beginning with your past, ask yourself where you fit on this scale...” (Klein et al., 1985, p. 40). When participants are asked to reflect on their past, they need to accurately recall information about their past sexuality. Such a process is likely susceptible to memory biases or degradation (Graham et al., 2003; Talari & Goyal, 2020)

Prospective methods reduce the likelihood of recall biases that can arise in retrospective methods because participants are asked about their attractions at the present time and repeatedly

over a period (e.g., Schroder et al., 2003). Researchers have identified the limitations of retrospective methods when measuring sexuality-related constructs (Graham et al., 2003). For instance, in their study of the flexibility of sexual orientation over time, Kinnish et al. (2005) mentioned the methodological limitations of their study, given the use of retrospective measurement: They discussed potential concerns that their participants may not have been able to accurately recall how they felt, thought, or behaved decades before the present day. The present review focuses on prospective studies to reduce the likelihood of memory errors.

### **The Effect of Gender and Age on Sexual Attraction**

Two potential influences on sexual attraction are a respondent's gender and age. The study of sexual attraction should consider the influence of gender because some research has suggested different degrees of sexual attraction fluidity as a function of gender identity (Diamond, 2008a; Diamond et al., 2017; Timmins et al., 2021). Age has not been studied as much, but one could expect that targets of sexual attraction might change as a function of age (e.g., Kenrick & Keefe, 1992; Seto, 2017). Certainly, other influences on sexual attraction have been documented (e.g., number of sexual partners; Fu et al., 2019; sexual attractiveness changes among partners; Mark & Herbenick, 2014), but they are beyond the scope of this review.

#### ***Gender***

Diamond (2008a) suggested that sexual orientation is not a fixed or stable trait but rather mutable and dynamic. In addition, fluidity in sexual attraction may be experienced differently by women than by men. Diamond (2016) described sexual fluidity as a construct of "situation-dependent flexibility in sexual responsiveness" (pp. 249). This description of sexual fluidity implies that a stated sexual orientation at a given time is insufficient in predicting the sexual desires, attractions, and behaviors experienced by people over their lives. Diamond further

suggested that individuals can experience a range of sexual identities, attractions, and behaviors that can change together or independently with time. She mentioned that the reasons for gender differences in fluidity are unclear, but that sex differences in genital arousal may predispose men and women to different patterns of sexual attraction. Indeed, there may be several gender differences that contribute to varied rates of sexual fluidity (e.g., societal or cultural differences in how sexuality is expressed; Ventriglio & Bhugra, 2019)

The study of fluidity and gender has produced mixed results, with some reports of women being more fluid (e.g., Diamond, 2008a; Diamond et al., 2017; Katz-Wise, 2015), some reports of men being more fluid (e.g., Katz-Wise et al., 2016; Katz-Wise et al., 2017), and some reporting no gender effects (e.g., Mock & Eibach, 2012). Mock and Eibach (2012) followed a sample of 1,370 adult women and 1,190 adult men for ten years to examine the degree of change in reported sexual orientation. They reported that, between the first and second waves (ten years apart), approximately 2% of women and men experienced a change in sexual orientation. Some caveats are that participants' sexual attractions may have changed in many more ways during this long period, and that Mock and Eibach only focused on gender-based orientations.

### *Age*

People may also experience changes in sexual attraction as they age (Buunk et al., 2001; Kenrick & Keefe, 1992; Seto, 2017). One common finding is that women tend to maintain sexual attraction to partners relative to their age, but men tend to have sexual attraction to increasingly younger partners as they age (Blanchard et al., 2012; Buunk et al., 2001; Kenrick & Keefe, 1992).

Buss and Schmitt's sexual strategies theory (1993) suggests that people have context-dependent strategies for selecting sexual partners, and men and women may select sexual

strategies differently in short- versus long-term mating contexts. According to their theory, men may prioritize, in certain situations, having multiple short-term partners to produce more offspring, while women may prioritize long-term strategies more often, given the biological investment they must make in each child. Men and women also experience different physiological and hormonal changes with age. These changes may influence the sexual strategies used (e.g., see Vinogradov's 1998 interpretation of the male "live-fast-die-young" strategy). If men and women, with age, adopt different strategies for selecting sexual partners, they may also develop different and corresponding preferences, such as what people they are sexually attracted to. Little is known about the trajectories of change in sexual attractions as a function of age. Sexual strategies theory offers no explanation of changes regarding gender-based attractions. However, when applying sexual strategies theory, one might expect that men and women experience changes in their sexual attractions as they adjust their short- and long-term sexual selection strategies with age.

There is some evidence of change in sexual attractions with age for most sexually mature age groups. This includes research on adolescents aged 12 to 25 (e.g., Cohen et al., 2020; Petit et al., 2021a), young adults aged 18 to 35 (e.g., Dickson et al., 2013; Katz-Wise et al., 2017), and middle-aged adults aged 35 to 60 (e.g., Doolin, 2014; Talley et al., 2015). However, there is a paucity of research on the sexual attractions of older adults.

### **Year of Publication**

With time, people's sexual attitudes, sexual norms, and patterns of sexual behaviors may change (e.g., Hunt et al., 2019). Societal changes in what is acceptable or permissible in the context of changing sexual attractions may also have an influence (e.g., Hammack et al., 2018). In their 1996 paper, McClintock and Herdt describe the experience of a 10-year-old boy first

feeling sexual attraction to Star Trek's "Captain Kirk" shirtless on television, something that would likely be met with societal outrage in another epoch (e.g., Cheng et al., 2016; Pampel, 2016). David Levy's 2009 novel *Love and Sex with Robots* predicts a future where humans are sexually attracted to robots. Levy's predictions would have rung hollow in previous centuries; sexual attraction to advanced artificial intelligence was either inconceivable or highly stigmatized (Dubé et al., 2023). Notably, Peterson and Hyde (2010) reported that publication year moderated the effect size of various components of human sexuality in their meta-analysis of gender differences in sexuality. When studying sexual attraction, samples may vary in the attractions and fluidity they report as a function of when the study occurred and the cohort or generation into which they were born.

### **Types of Samples**

Whom researchers recruit may also influence the magnitude of change. For example, conversion therapies have a history of being conducted within a religious framework or with religiously devout people (Haldeman, 1994). People who are religious may report different understandings and experiences with their sexual attractions than others (Cohen et al., 2020; Visser et al., 2007). Other groups may also report different patterns of change in sexual attractions (e.g., students recruited from schools or universities; Denny et al., 2016; Rostosky et al., 2003). For example, Savin-Williams and Ream (2007) argued that school provides an environment of sexual opportunity that may influence sexual fluidity for students. Therefore, each study's sample type was coded (e.g., samples from the general public, religious groups, and student groups) to explore if changes in sexual attractions differ between these groups.

### **Measurement Differences**

When researchers compare results across studies, they must consider if this decision is justified given the diverse methods of measurement that might be used (Borenstein et al., 2021). For example, Diamond (2008b) asked participants to rate their attraction by shading portions of a pie chart, later converted to a percentage. Alternatively, the Kinsey scale requires participants to select one of seven options to classify their sexual attractions. How to compare “45% attraction” to a “Kinsey three” is unclear. For the present study, each study’s measure of sexual attraction was coded (e.g., the Kinsey scale versus Diamond’s pie chart). Reviewing measure differences may generate hypotheses for future research on changes in sexual attractions.

### **Period Differences**

Researchers also use varying periods when measuring changes in sexual attractions. For example, Katz-Wise et al. (2017) had a one-year gap between the baseline and final assessments, while Yarhouse et al. (2009) had five years. Larger changes might be expected over longer periods. Therefore, the length of time each study had between initial and final assessments of sexual attraction was coded to assess if sexual attractions changed differently as a function of the time passed between assessments.

### **Current Study**

The current study aims to review the relevant prospective literature on changes in sexual attraction systematically. The focus of this study was on quantifying how many participants experienced any change in sexual attractions. Four general questions were tested:

- RQ1: How are researchers defining sexual attraction when they study change?
- RQ2: What measures have researchers used to assess changes in sexual attraction?
- RQ3: What measurement period (i.e., time between first and final assessment) have researchers used to measure changes in sexual attraction?

- RQ4: How many people experience changes in their sexual attractions?

### **Method**

This review was conducted with a data collection plan and a coding system informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). Coding included participant biographic variables, study methodology, and measures and definitions of sexual attractions.

Meta-analytic calculations were originally planned to aggregate studies, and meta-regressions were planned to assess the influence of gender, age, year of the study, type of sample, type of measure used, and the period between initial and final assessments. However, this quantitative analysis could not be completed because of a lack of available individual-level data and a small number of studies meeting the inclusion criteria. As the focus of the present study was to measure change in any direction, individual-level data were needed because the mean scores reported by researchers represent an aggregate of changes in multiple directions, producing a considerably conservative estimate of change. For example, if a study with two participants finds that one participant changed from a Kinsey “5” to a Kinsey “3” (net change of -2) while the other changed from “3” to “5” (net change of +2), researchers typically report a  $\text{mean}_{\text{change}}$  of 0 ( $2 - 2 / 2$ ) because they do not use absolute values, which does not reflect the change exhibited by both participants. There was insufficient individual-level data to calculate change using absolute values for each participant. Thus, a narrative synthesis was used to provide insight into hypotheses and research questions that may interest researchers. Additionally, to quantify changes in sexual attractions, the number of participants who reported change is reported.

### **Search Strategy**

The following databases were selected because they contain numerous empirical studies on human sexual attraction: APAPsycInfo (Ovid), MEDLINE (Ovid), CINAHL(EBSCO), Sociological Abstracts (ProQuest), Web of Science, ProQuest Dissertations, and Theses Global (ProQuest). Given that sexual attraction has numerous overlapping constructs and synonyms, the initial search terms reflected a broad range of concepts. The following terms, their linguistic variants, and term-strings were used in each database and customized to the database as needed: “sexual attraction,” “sexual fantasy,” “sexual orientation,” “sex drive,” “sexual interest,” “sexual feelings,” or “sexual thoughts” in combination with “difference” or “stability” or “fluidity,” “lability” or “change.” A filter was used to select only studies with a prospective approach (e.g., “follow-up” studies, “pre- and post-” studies). This filter was designed with Mr. Patrick Labelle and has been used in previous research (e.g., Li et al., 2019). This search was conducted on January 1st, 2022, and was designed to capture all relevant studies published on these databases on dates on or before January 1st, 2022. The search identified 6,503 studies.

Identified studies were imported into the Covidence framework (Veritas Health Innovation, 2022). Duplicate studies were identified and removed from this initial database (1,028). Studies were then sorted and reviewed by (1) title and abstract screening, (2) full-text review and further screening, and (3) data extraction and coding. Studies were excluded for various reasons (e.g., if they contained a clinical sample of people undergoing intervention without a non-clinical comparison group). The inclusion/exclusion criteria used in making the decisions in the first phase (title and abstract screening) are listed in Table 2.1, while those used in the second phase (full-text review) are listed in Table 2.2.

### **Screening and Extraction**

See Figure 2.1 for an overview of the screening process through a PRISMA flow diagram. In the first phase, titles and abstracts were reviewed by the primary investigator and an independent reviewer (e.g., one of two co-authors). Independent reviewers were trained over two hour-long sessions and were given a sample of 25 studies to practice. In the first round of training, both reviewers achieved 100% agreement with the primary investigator. Each reviewer screened half of the studies included in this phase. Disagreements in decisions were resolved through discussion with each reviewer independently. When reviewers did not reach an agreement, the study was sent to the senior co-author to provide a final decision. Of the 5,475 studies reviewed at this stage, 660 were retained. This process involved 640 disagreements and 4,518 unanimously removed studies. In the title and abstract phase of the review, there was an average agreement rate of 87%. According to McHugh (2012), this value can be interpreted as substantial agreement. Only one study was sent to the senior author for a final decision (and was included).

The next phase involved the full-text review of 660 studies. The primary investigator and both independent reviewers reviewed the studies. Each independent reviewer screened half of the studies. Disagreements in decisions were resolved through discussion with each reviewer independently. The study was sent to the senior author for a final decision when reviewers disagreed. Of the 660 studies, 24 were retained. This process involved 48 disagreements and 588 studies that were unanimously removed. In the full-text review phase, there was an average agreement rate of 93%. All studies were reviewed and agreed upon, with no studies being sent to the senior author.

Data were extracted from the selected studies in the third phase to compute descriptive statistics. A coding form was used to code biographic information and statistics relevant to how

sexual attraction was measured. There was heterogeneity in how researchers used similar measures for sexual attraction and orientation. The wording of each measure was reviewed, and the study was included only when direct and exclusive mention of sexual attraction was made. Studies were also only included if it was clear that participants would be rating their sexual attraction. The primary investigator and the two independent reviewers coded all the studies. Each of the two independent reviewers coded half of the final sample of studies (final sample = 24). Disagreements in coding were resolved through collaborative discussion, with the senior author mediating unresolved disagreements. However, there were no disagreements at this phase.

In response to reviewer feedback, each study was coded for the sample's sexual orientation. Two independent reviewers scanned the primary studies for information regarding sexual orientation, sexual identity labels, and gender composition of the sample. Each reviewer then used a coding guide to select one label that best described the sample's sexual orientation (see Table 2.3). There was a 92% agreement rate among reviewers for this variable.

### **Selected Studies**

Table 2.3 provides an overview of the 24 studies that met the criteria for inclusion in this review. All 24 studies were reviewed for quality and risk of bias using the Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies tool (National Heart, Lung, and Blood Institute, 2021). All studies were labeled “fair” overall but ranged in what evidence was presented to reduce risk and indicate quality. Therefore, the certainty of the present study's findings is limited by each study's risk, bias, and quality. Of these 24 studies, 21 were missing essential information (e.g., a sexual attraction score at baseline or the percentage of the sample that experienced any degree of change). Accordingly, 21 authors were contacted for more information. Of these 21, 11 authors responded, 8 of whom provided the requested data (7 of

whom provided aggregate-level data, and one provided individual-level data), and 3 responded that the data were no longer available.

### **Analysis Plan**

As an accurate meta-analysis of coded data could not be completed, the nine-point synthesis without meta-analysis (SWiM) method was used to synthesize data across studies in a narrative format (Campbell et al., 2020). First, descriptive statistics of the samples and coded data were reviewed. Next, the participants from each study who experienced any change in sexual attraction were aggregated, and patterns among coded groups were reviewed (e.g., whether studies published earlier reported more participants who experienced change).

## **Results**

### **Overview of the Included Studies**

The present study's review strategy resulted in 24 studies meeting the criteria for inclusion. Of these 24 studies, nine had overlapping samples (e.g., drawing on the same data as another of the included studies), leaving 15 unique samples (herein referred to as primary studies). See Table 2.3 for a summary of the included studies. Of the 24 studies included, 22 were peer-reviewed articles published in academic journals, and two were published dissertations. The date of publication ranged from 2000 to 2021. Most of the primary studies were conducted in the USA (11), with representation from New Zealand (2), Canada (1), and Croatia (1).

### **Describing the Study Samples**

When reviewing recruitment strategies, most of the included studies used printed material to recruit participants (60%, 9/15). Online methods of recruitment (40%, 6/15) and in-person recruitment (33%, 5/15) were also used. Nearly half of the included studies used multiple

methods of recruitment (47%, 7/15). Three studies did not report how they recruited participants (20%, 3/15). Most studies recruited participants from the general public (60%, 9/15), with other samples coming from educational settings (universities; 13%, 2/15; middle/high schools; 13%, 2/15) and Christian religious groups (13%, 2/15).

Researchers primarily collected data through in-person questionnaires (60%, 9/15), online questionnaires (47%, 7/15 studies), in-person interviews (47%, 7/15), and phone-based interviews (7%, 1/15). One study (Yarhouse et al., 2009) did not have clear information about how the data were collected but noted that questionnaires (format unknown) were sent to participants. Multiple methods of data collection (e.g., in-person questionnaires for some participants, online questionnaires for others) were used by 10 of the 15 studies.

Pooling participants across primary studies with non-overlapping samples (15), 11,943 unique participants provided data on their sexual attractions. These participants ranged in age from 14 to 76, with an average age of 18.7. The pooled sample comprised women (61%) and men (39%). A very small percentage, .39% ( $n = 46$ ), of the pooled sample identified as transgender. While it was planned to code for participants' ethnic/racial identity, relationship status, and educational background, most studies did not collect or report this information.

### **Definitions of Sexual Attraction (RQ1)**

All the included studies described how they operationalized sexual attraction in terms of what measure they used. However, only two studies included a conceptual definition (e.g., sexual attraction as “feeling aroused by someone whom you find attractive”; Diamond et al., 2017; sexual attraction as the “degree of opposite- vs same-sex sexual desire”; Talley et al., 2015). Additionally, five studies reported sexual attraction as an “indicator” or “component” of sexual orientation (Diamond, 2000; Diamond, 2003b; Jones & Yarhouse, 2011; Petit et al., 2021a; Petit

et al., 2021b). All the included studies conceptualized sexual attraction as a gender-based construct (e.g., asking people the gender to whom they are sexually attracted), and none included other attraction targets.

### **Measuring Sexual Attraction (RQ2)**

Researchers used several measures to assess prospective changes in sexual attraction over time. All these measures directly (i.e., used the terms sexual attraction) and exclusively (i.e., only measured sexual attraction) referenced sexual attraction in the wording presented to participants (see Table 2.3 for brief descriptions of the measures used). They used the Kinsey scale or a modified version of the Kinsey scale (53%, 8/15), the Yarhouse Sexual Orientation Thermometer (YSOT; 13%, 2/14), Diamond's pie chart (7%, 1/15), the Shively and DeCecco scale (7%, 1/15) or the KSOG (7%, 1/15). Besides Diamond's measures (Diamond, 2008b; Diamond et al., 2017), which asked participants to shade in portions of a 16-part and 100-point pie chart or along a 10-point scale, all other researchers used measures with 6–7-point Likert scales. Several studies measured sexual attraction using items created for their study (20%, 3/15). All the measures and items exclusively assessed gender-based sexual attractions.

### **Timing of Measurement (RQ3)**

Researchers measured sexual attraction at multiple time points, with varying intervals between initial and final assessments. Six studies assessed sexual attraction at two time points, while nine included more than two time points. The range of the number of assessments was from two to 30. Each study's first and final time point data were used as reference points for the present study. Two studies assessed and reassessed sexual attractions within a month, one within six months, three within a year, two within two years, two within five years, four within ten

years, and one within 17 years. The average time from the initial to final assessment was 1,662 days, or approximately four years and six months (median = 19.7 months).

#### **Changes in Sexual Attraction (RQ4)**

A total of seven studies that reported on how much of their sample experienced any degree of change were identified (see Table 2.3). Among these seven studies, there were 8,008 participants, of whom 18% experienced changes in self-reported sexual attraction scores. Changes were calculated by comparing individuals who provided responses that differed from their original assessments (e.g., a different Kinsey or KSOG score at follow-up) to the total pooled sample size. Four studies reported changes within the manuscript (either in-text or within tables and figures), while three studies provided this data upon request.

The percentage of how many participants within each study experienced a change in self-reported sexual attraction scores over time ranged from approximately 11% (i.e., Katz-Wise et al., 2017) to 87% (i.e., Diamond, 2008b; 86.7%; Jones & Yarhouse, 2011; 86.9%). The study with the lowest percentage of the sample that experienced change (Katz-Wise et al., 2017; 11%) was conducted with a sample of varying ages ( $M = 25$  with a range of 16 – 54) and genders (45 transgender men, 42 cisgender men, 53 cisgender women). The study with the highest percentage of the sample that experienced the change (Jones & Yarhouse, 2011; 87%) was also the study with the highest participant mean age (37.5) and was conducted with participants (72 men and 26 women) from a religious organization who were interested in changing their attractions.

#### **Discussion**

The goal of the current study was to systematically review and document the relevant literature on changes in sexual attractions. Despite the small number of prospective studies, preliminary answers to the four research questions can be discussed and explored.

There were two conceptual definitions of sexual attraction identified among the included studies (sexual attraction as “feeling aroused by someone whom you find attractive”; Diamond et al., 2017; sexual attraction as the “degree of opposite- vs. same-sex sexual desire”; Talley et al., 2015). There was heterogeneity in how researchers operationalized sexual attraction and the measures they used, with differences also noted in how researchers used the same measures (e.g., the Kinsey scale). These methodological differences limit the scope and validity of the present study’s findings. Conceptual definitions without consensus nor standards for operationalization have been identified in other bodies of literature on human sexuality, such as the literature on pornography (Fisher & Kohut, 2020; Kohut et al., 2020). Fisher and Kohut (2020) discussed how the lack of agreement across conceptual definitions could produce a body of literature that varies in how researchers measure, interpret, and discuss their variables of interest. A similar state of affairs was documented in the present review.

All the studies in the present review conceptualized sexual attraction as attraction to one or more genders. Accordingly, this review did not identify any research on measuring prospective and longitudinal changes in sexual attractions to other stimuli (e.g., chronophilias; Seto, 2017). The working conceptual definition of sexual attraction used in conducting this review was *an orienting response to a stimulus (persons, attributes, contexts, acts, etc.) that generates sexual states (e.g., sexual arousal)*. This definition seems consistent with how others conceptualize and measure sexual attraction (e.g., Kauth, 2000). However, this novel definition includes diverse targets to which people may be sexually attracted (e.g., age, objects, acts). Future research should continue to assess our definition to determine if it would be a viable and comprehensive way of studying sexual attraction. This may also guide future prospective and longitudinal studies that assess changes in sexual attraction to diverse stimuli.

The second research question was to query what measurement methodologies were used to assess prospective changes in sexual attraction. With one exception (i.e., Katz-Wise et al., 2017, which had a categorical measure), all the measures in the final sample shared two characteristics: they measured sexual attraction along a continuum and to gender targets (e.g., men and women). Researchers most often measured the sexual attraction a participant reportedly felt towards one or more genders. Further, measures often required participants to respond using an inverse proportion method (e.g., indicating high attraction to one gender implies lower attraction to another). This method has been critiqued as problematic because participants must counterbalance their attraction to another target when responding (e.g., Shively & DeCecco, 1977). Some researchers, like Yarhouse et al. (2009), have alternatively chosen to measure sexual attraction to different genders along independent scales.

Researchers varied in the number of response options their measures included, with most consisting of seven response options. The variation in measurement limits the certainty of the main finding that approximately 18% of participants experienced a change in sexual attraction. Diamond's 100-point pie chart, the wider response option, still anchored participants' responses to 16 sections (e.g., Diamond, 2000; Diamond, 2003b; Diamond, 2005; Diamond, 2008b). Even if participants anchored their responses to these 16 sections, they still had many more options than those who were given other measures. Diamond's studies also reported the largest percentage of the sample that experienced any degree of change (i.e., 87% in the primary study, tied with another study). Perhaps this is a function of the diverse response options participants in these studies had, as they were the only studies that did not reduce ratings of sexual attraction to few response options. Future researchers should test the psychometric properties of the measures used to capture changes in sexual attraction with particular attention to precision.

According to this review and synthesis, the Kinsey scale continues to be the measure of sexual attraction most often used to *classify* participants. In developing the Kinsey scale, Kinsey et al. (1948) intended to create a research classification system to describe the sexualities of nearly 12,000 participants. The resulting 0–6 scale challenged the social norms at the time that sexual orientation was binary and that non-heterosexual attraction was rare and pathological. Their work did not focus on further expanding the scale with more response options. As other researchers used the scale, it became labeled a “self-report” measure and was subsequently used as such (Casey, 2022).

Casey (2022) discussed how researchers commonly use the Kinsey scale by selecting a 1–2-point range to classify groups of participants (e.g., comparing people who are a Kinsey 1 or 2 with those who are a Kinsey 5-6). This Kinsey scale method restricts the sample to discrete groups and excludes participants from specific analyses based on the measure’s specificity (or lack thereof). This may function well when attempting to make meaning of changes (e.g., interpreting a change from “2” to “3” is easier to interpret than a change from “98” to “93”). However, discrete groups and restricted options come at the expense of precision and nuance and limit the interpretability of variation in sexual attractions. In this review, the Kinsey scale was still used with its classification system and restricted response options. Thus, the scale is used in ways that seem continuous but are often refined into categories or groupings for statistical analyses (Casey, 2022). Comparing measures with varying response options in terms of how participants respond and how data are analyzed could help further our understanding of how sexual attraction (and changes therein) are best measured.

When studying sexual orientation, Morandini et al. (2021) demonstrated differences in how participants respond to continuous versus categorical measures. Participants in their studies

(180 university students in the first study and 460 participants from the general population in the second study) were more likely to report non-exclusive sexual orientations when reading a summary about sexual orientation existing on a continuum than as distinct categories. Exposing participants to conceptualizations of sexual orientation as fluid or continuous was related to heterosexual participants being up to five times more likely to report a non-exclusive heterosexual sexual orientation. This may apply to the measurement of sexual attraction. When participants are given diverse response options, they may be more likely to select ‘in-between’ responses than if given a small number of discrete categorical responses.

The third research question asked what time periods researchers used to measure sexual attraction. Among the studies included in this review, the time periods researchers used varied from daily diary studies (e.g., Diamond, 2008b) to follow-up assessments 17 years after first assessing participants (e.g., Dickson et al., 2013). The average period used was approximately four years and six months. Researchers did not typically discuss the influence of timing and most focused on standardized intervals of time between assessments instead of exploring variation in timing intervals. Some researchers calculated changes between standardized intervals and found significant changes but varying directionalities (i.e., a decrease in same-sex attraction between T1 and T2 but an increase between T2 and T3; Jones & Yarhouse, 2011). This finding may help generate hypotheses related to sexual fluidity and directionality in changes with time.

Without more individual-level data, a robust assessment of the influence of timing and changes in sexual attraction was not possible. However, studies published in earlier years were noted to have larger percentages of their sample who experienced any degree of change than other studies. A reasonable hypothesis could be that this finding is a function of the recruitment

strategies used by researchers and the sociocultural epochs of each sample. Two of the earliest published studies, Diamond (2008b) and Yarhouse et al. (2009), offer some insight in this regard.

Diamond (2008b) and Yarhouse et al. (2009) are the earliest publications and report larger percentages of their sample that experienced change than most other studies in this review. These two studies have several similarities in their recruitment tactics; both recruited participants at a similar time in the USA (i.e., the late 1990s and early 2000s) and used purposeful sampling of specific groups of people questioning their sexual attractions. Diamond sampled participants from targeted groups of women who were specifically likely to “acknowledge same-sex attraction or who have begun to question their sexuality” (Diamond, 1998, p. 1089). Diamond also sampled specifically from lesbian, gay, and bisexual (LGB) communities as she was interested in oversampling minoritized women in line with her hypotheses that they would experience sexual fluidity. Yarhouse et al. also used targeted recruitment of participants questioning their sexuality, which involved people “struggling” with same-sex sexual attractions. Yarhouse et al. used a “gatekeeper” within the Christian community who “made the study available to potential participants” (pp. 329). Practically, this means the participants in this study were selected only if they were contending with their attractions.

Diamond (2008b) and Yarhouse et al. (2009) recruited participants who presumably believed that sexual attractions are mutable. Perhaps these beliefs were shaped by personal experiences, but it is also likely that the sociocultural and political attitudes of the epoch shaped them. The 1990s and early 2000s were contentious times for LGB rights in American society, and social attitudes were becoming progressively more accepting of same-sex behavior (Twenge et al., 2016). There was a rise in the claims of the innateness and immutability of sexual orientation, notably among LGB groups trying to establish legitimacy and legal rights (Diamond

& Rosky, 2016). Religious groups were at the center of moral and social disapproval of same-sex sexual attractions and influenced policies and laws of the time (see Diamond & Rosky, 2016). However, people on “both sides” of these debates were likely still experiencing changes in their sexual attractions (as noted by the effect sizes reported by these two studies). Therefore, both studies selected participants experiencing changes in sexual attraction yet living in a society that held the narrative that sexual orientation or attraction was fixed. This may represent a sample bias and likely inflates the degree of change that other people from the general public and those living in other epochs experience.

The final research question asked how much people’s sexual attractions change with time. In a pooled sample of 8,008, 18% of participants experienced some degree of change in their sexual attractions. To qualify this finding, studies were coded to label their sample in terms of sexual orientation. However, there was a mix of orientations and genders included in the 18% change statistic (i.e., mostly heterosexual women from Manley et al., 2015 were grouped with non-heterosexual women from Diamond, 2008). Three studies accounted for most participants in this pooled sample of 8,008 (i.e., Cohen et al., 2020; Petit et al., 2021a; Spittlehouse et al., 2020). Of the 18% of people who experienced change, 87% (1,277 participants out of 1,473 that changed in the pooled sample of 8,008) came from these three studies, which largely consisted of heterosexual men and women. However, because there was insufficient individual data, this finding is imprecise, as it is uncertain which participants specifically changed and what their sexual orientations were. Therefore, it is uncertain if the finding that 18% of participants experienced change is representative of the general population or confounded by varying degrees of sexual fluidity among different attraction or orientation groups.

The study by Katz-Wise et al. (2017) reported the lowest percentage of the sample that experienced change (11%), but this was also measured using a categorical variable (change or no change). Asking participants if they changed or not, categorically, may not capture variation in changes and may underestimate the changes experienced if participants label “small changes” as “no changes.” While some studies reported high percentages of their sample experiencing change (e.g., Diamond, 2008b; Jones & Yarhouse 2011), the findings of the present study are heavily influenced by the Petit et al. study (2021a), which had the largest sample in this pooled sample (4,691; 59% of the pooled sample). The percentage of participants who experienced change (18%) in the study by Petit et al. (2021a) represents the median value amongst the pooled sample. Interestingly, this study had the lowest average participant age (16). This means that approximately half of the studies, all of which had older average ages than that of Petit et al. (2021a), reported higher percentages of participants who experienced a change in sexual attractions. The study with the highest average participant age (Jones & Yarhouse, 2011; 37.5) also reported the greatest percentage of the sample that experienced any change (87%). This generates an interesting research question related to age and changes in sexual attraction: Do people experience changes in sexual attraction differently as a function of their age?

It is likely and indeed supported that changes in sexual attraction are not linear through the lifespan and exhibit “peaks” and “valleys” with time (e.g., Diamond et al., 2016; Dickson et al., 2013). There is considerable evidence that sexual attractions and orientation are particularly labile during adolescence and into young adulthood (e.g., Cohen et al., 2020; Ott et al., 2011; Savin-Williams & Cohen, 2015). In the present review and synthesis, lability was not observed in any age group that was markedly distinguished from others in reference to the percentage of the sample that experienced change. Instead, these results seem to fit better with a variable

pattern of change with age. Future research should follow up on this finding to explore what such trajectories of change may look like across the lifespan and how linear (or not) these changes may be.

In addition to the influence of age, it was originally planned to explore if participants' own gender influenced their experienced change in sexual attraction. In the present review and synthesis, there was an interesting finding related to gender among the two studies that noted the greatest percentage of participants who experienced change (Diamond, 2008b; Jones & Yarhouse, 2011). The study by Diamond (2008b) was conducted with an all-women sample and reported that 87% of the sample experienced change. Alternatively, the Jones and Yarhouse (2011) study was conducted primarily with men (73% men) and also reported that 87% of the sample experienced change. Change seemed to occur similarly, or at least comparably, in men and women.

The present study's results can be compared to Diamond's hypotheses about women's sexuality based on her theory of sexual fluidity. Diamond (2016) conceptualized a pattern of results in her literature review that suggests women experience more change in sexual attractions than men. Only one of the studies identified in Diamond's review (Dickson et al., 2013) was included in the present study as the others did not meet the inclusion criteria and arguably did not measure sexual attraction specifically (see limitations section for an example of why studies such as Add Health were not included).

In later works, Diamond et al. (2017) also followed up on the theory of sexual fluidity with a study of men and women. In this study, Diamond et al. used a dynamic systems approach to examine the effect of gender on sexual fluidity. While women in the study experienced greater day-to-day shifts in sexual attractions, they did not retrospectively report greater changes in

attractions since adolescence. This finding helped inform one of the author's key conclusions: women may not be uniformly more sexually fluid than men, but the role of gender may depend on timescales of assessment. In short, men and women may both experience sexual fluidity in different ways.

The present study's findings provide some support for the findings of Diamond et al. (2017) but also raise questions about the influence of religiosity and changes in sexual attraction. In their study of Croatian high school students, Cohen et al. (2020) reported no significant influence of religiosity on changes in sexual attraction. However, Jones and Yarhouse (2011) had an older sample from a different country and sociocultural environment (i.e., USA and sampled from Exodus International ministries). Jones and Yarhouse reported that their participants were recruited from Exodus International, a Christian organization that claims homosexuality is a "sin" (Panozzo, 2013). Exodus-affiliated ministries, the primary recruitment source for the study, claim to help people achieve "freedom from homosexuality through the power of Jesus Christ" (Exodus, 2007). Organizations like Exodus International may benefit from results favoring significant change in sexual attraction towards heterosexuality (Haldeman, 1994). This organization likely influenced who was recruited for the study, but the authors did not thoroughly discuss the implications of their methodological decisions. Regardless of potential sample bias and methodological concerns (see Panozzo, 2013), the Jones and Yarhouse study reported variable results whereby participants decreased in same-sex attraction between T1 and T2 while increasing in same-sex attraction from T2 to T3. This generates interesting research questions about the influence of religiosity as a function of both age and gender. Simply put, do older men high in religiosity experience change in sexual attractions differently than younger

men, women, and those lower in religiosity? If religiosity has an influence on change, is it long-lasting?

### **Limitations and Future Directions**

The results of this study should be interpreted with knowledge of several limitations. The original goal of meta-analyzing findings could not be achieved given the lack of availability of individual-level data reported or stored by researchers. This limited the interpretation of several findings.

Importantly, it is difficult to adequately assess the validity of the finding that 18% of people experience some degree of change and to determine if these are “true” changes in sexual attraction. Assessing if “true” change occurred should involve considering variables such as self-presentation and measurement error. There are likely additional confounding variables (e.g., participants making errors, recall biases, feigned responses) as well.

Depending on underlying cultural or subcultural values, participants may over- or under-report a particular aspect of their sexuality to increase their perceived social value (Catania et al., 1990). This may precipitate a sample bias among the studies (e.g., participants from Exodus ministries reporting greater change toward heterosexual attractions given cultural values within the organization). Participants may also alter their responses to specific questions to appear more socially desirable. It is recommended that future studies measure sexual attraction with particular attention to social desirability and other individual variables that may facilitate biased responses (Dawson et al., 2019).

Further, the present study is limited in its deductions as a function of how precise (or imprecise) the measures used by researchers were. Many measures across the final sample of studies used Likert scales, which have notable limitations. In seven-point formats, such as the

Kinsey scale, there have been concerns that change scores may be unreliable or potentially invalid, given how imprecise or conceptually inappropriate the measure might be (Dolnica, 2021; Roberson et al., 1995). The results of this review should be interpreted accordingly, as combining the different measures from included studies can impact the validity and reliability of the results. Future studies should use more continuous measures of sexual attraction that provide diverse response options, are sensitive to change, and demonstrate appropriate short-term test-retest reliability.

All the measures used by the studies in the final sample measured sexual attraction to genders. Participants were often asked to rate their sexual attraction to one gender compared to another. Further, most measures included anchors with completely heterosexual on one end and completely homosexual on the other. People's sexual attractions may change differently towards one of these anchors than the other. Indeed, Diamond (2016) explained that sexually diverse women experience greater fluidity than exclusively heterosexual women. There are likely to be numerous individual differences beyond sexual orientation or identity that may influence one's sexual attractions (e.g., beliefs about sexuality and perceived social support, changes in partner dynamics and relationships). Given the diverse ways researchers conceptualize and measure sexual attraction, there was insufficient information to compare response anchors across measures. Similarly, directional differences in participants' responses could not be evaluated (e.g., are changes toward same-sex more likely, compared with changes toward other-sex?). Future research should use research designs that allow for comparisons of directionality by measuring sexual attraction to diverse targets using the same scale with the same anchors, along with absolute change.

Lastly, the present study's results are limited by a relatively small sample of included studies. Studies were excluded from this review for several reasons (e.g., having only a clinical sample, measuring sexual attraction vaguely or by using sexual orientation terminology, not quantifying sexual attractions). Many excluded studies reportedly measured sexual attraction but instead measured other constructs such as sexual attractiveness, sexual fantasy, or romantic attraction. While these constructs likely overlap, we focused on sexual attraction in an attempt to provide a more precise and valid analysis. For example, sexual attractiveness likely overlaps with sexual attraction; however, attractiveness refers to the quality of the stimuli, while attraction is a phenomenon of the rater (e.g., perhaps people would rate a certain celebrity as sexually attractive, but they themselves are not sexually attracted to the celebrity).

While the decision to focus on sexual attraction was made to increase the validity of our findings, it also limited the ability to capture all potential studies measuring changes in sexual attraction. For example, the National Longitudinal Study of Adolescent to Adult Health (Add Health) includes a "sexual attraction" item. However, it is framed and measured as romantic attraction, which differs from sexual attraction (Harris et al., 2019). The Add Health study is amongst the largest to collect data on human sexuality, is highly cited, and has had its data widely used (e.g., Hu et al., 2016; Kaestle, 2019; Needham, 2012; Russell et al., 2002; Savin-Williams et al., 2012). A study by Berona et al. (2018) was also excluded as participants were under 16 years of age at baseline, and the authors supplied no further data. Other studies, such as Rosario et al. (2006), Weinberg et al. (1995), and Stokes et al. (1997) used measures that combined sexual attraction with other constructs (i.e., sexual thoughts and fantasies; romantic attractions; sexual feelings) and thus were excluded.

Moreover, some excluded studies included items that relied on cognitive functions such as memory, which increased the likelihood of participants reporting responses that did not accurately reflect their change in sexual attraction. Hence, studies that used the KSOG scale once (e.g., Gregory, 2009; Iasenza, 1991) were excluded because participants were asked to identify their past and present sexual attraction simultaneously. In addition, the studies using KSOG once to measure present and ideal/future attraction were also excluded as using a projective measure may not demonstrate adequate validity, reliability, or comparability to prospective measures of sexual attraction (Sager, 2005). It is recommended that future researchers focus on how to ideally and appropriately measure changes in sexual attraction so that there could be some degree of consensus amongst the measures used.

## **Conclusion**

In conclusion, the results of this review suggest that sexual attractions change for almost a fifth of participants in studies with varying measures and time periods. Additionally, this review found that changes in sexual attractions have exclusively been studied in the context of gender-based sexual attractions. No authors included a definition, conceptualization, or measure of sexual attraction that asked participants about attraction to anything other than the gender identity of another. This study's narrative synthesis condenses evidence to suggest that future researchers should explore the influence of how we conceptualize and measure sexual attraction. These results also help inform hypotheses related to the influence of a participant's gender and age. It is recommended that future studies provide a clear conceptual definition of sexual attraction (or use the definition that we suggested here), identify and use psychometrically validated measures, control for socially desirable responses, and report more individual

biographic statistics. There is much to learn about sexual attraction; the path toward such knowledge appears to be anything but straight.

## References

**References selected for the systematic review are marked with \***

- Bailey, J. M., Hsu, K. J., & Bernhard, P. A. (2016). An Internet study of men sexually attracted to children: Sexual attraction patterns. *Journal of Abnormal Psychology, 125*, 976.  
<https://doi.org/10.1037/abn0000212>
- Bailey, J. M., Dunne, M. P., & Martin, N. G. (2000). Genetic and environmental influences on sexual orientation and its correlates in an Australian twin sample. *Journal of Personality and Social Psychology, 78*, 524. <https://doi.org/10.1037/0022-3514.78.3.524>
- Berona, J., Stepp, S. D., Hipwell, A. E., & Keenan, K. E. (2018). Trajectories of sexual orientation from adolescence to young adulthood: Results from a community-based urban sample of girls. *Journal of Adolescent Health, 63*, 57-61.  
<https://doi.org/10.1016/j.jadohealth.2018.01.015>
- Blanchard, R., Kuban, M. E., Blak, T., Klassen, P. E., Dickey, R., & Cantor, J. M. (2012). Sexual attraction to others: A comparison of two models of alloerotic responding in men. *Archives of Sexual Behaviour, 41*, 13-29. <https://doi.org/10.1007/s10508-010-9675-3>
- Bockting, W., Benner, A., & Coleman, E. (2009). Gay and bisexual identity development among female-to-male transsexuals in North America: Emergence of a transgender sexuality. *Archives of Sexual Behaviour, 38*, 688-701. <https://doi.org/10.1007/s10508-009-9489-3>
- Borenstein, M., Hedges, L. V., Higgins, J. P., & Rothstein, H. R. (2021). *Introduction to meta-analysis*. John Wiley & Sons. <https://doi.org/10.1002/9781119558378>
- Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: an evolutionary perspective on human mating. *Psychological Review, 100*, 204. <https://doi.org/10.1037/0033-295X.100.2.204>

- Buss, D. M., & Schmitt, D. P. (2019). Mate preferences and their behavioral manifestations. *Annual Review of Psychology*, 70, 77-110. <https://doi.org/10.1146/annurev-psych-010418-103408>
- Buunk, B. P., Dijkstra, P., Kenrick, D. T., & Warntjes, A. (2001). Age preferences for mates as related to gender, own age, and involvement level. *Evolution and Human Behavior*, 22, 241-250. [https://doi.org/10.1016/S1090-5138\(01\)00065-4](https://doi.org/10.1016/S1090-5138(01)00065-4)
- Campbell, M., McKenzie, J. E., Sowden, A., Katikireddi, S. V., Brennan, S. E., Ellis, S., Hartmann-Boyce, J., Ryan, R., Shepper, S., Thomas, J., Welch, V., & Thomson, H. (2020). Synthesis without meta-analysis (SWiM) in systematic reviews: reporting guideline. *bmj*, 368. <https://doi.org/10.1136/bmj.l6890>
- \*Caflisch, J. (2013). *Adjustment and change among bisexual women: A longitudinal analysis* [Doctoral dissertation, City University of New York]. ProQuest Dissertations and Theses Global. <https://www.proquest.com/docview/1467473419?parentSessionId=0uUFw7mENQNuhptLa6taexQ9vnsj7FqRuCf4szvtts%3D>
- Casey, D. (2022). *Revisiting the Kinsey scale: Toward a Higher Fidelity Measurement (and use of) the Original Kinsey Continuum* (Doctoral dissertation, San Francisco State University).
- Catania, J. A., Gibson, D. R., Chitwood, D. D. & Coates, T. J. (1990). Methodological problems in AIDS behavioral research: Influences on measurement error and participation bias in studies of sexual behavior. *Psychological Bulletin*, 108, 339-362. <https://doi.org/10.1037/0033-2909.108.3.339>

Centres for Disease Control and Prevention (2021) “*National Survey of Family Growth*”.

[https://www.cdc.gov/nchs/nsfg/index.htm?CDC\\_AA\\_refVal=https%3A%2F%2Fwww.cdc.gov%2Fnchs%2Fnsfg.htm](https://www.cdc.gov/nchs/nsfg/index.htm?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fnchs%2Fnsfg.htm)

Chandra, A., Copen, C. E., & Mosher, W. D. (2013). Sexual behavior, sexual attraction, and sexual identity in the United States: Data from the 2006–2010 National Survey of Family Growth. In *International handbook on the demography of sexuality* (pp. 45-66).

Dordrecht: Springer Netherlands. [https://doi.org/10.1007/978-94-007-5512-3\\_4](https://doi.org/10.1007/978-94-007-5512-3_4)

Cheng, Y. H. A., Wu, F. C. F., & Adamczyk, A. (2016). Changing attitudes toward homosexuality in Taiwan, 1995–2012. *Chinese Sociological Review*, 48, 317-345.

<https://doi.org/10.1080/21620555.2016.1199257>

Clarke, M. J., Marks, A. D., & Lykins, A. D. (2015). Effects of gender group norms on the endorsement of same-sex attraction, behavior, and identity. *Journal of Bisexuality*, 15,

319-345. <https://doi.org/10.1080/15299716.2015.1050537>

\*Cohen, N., Becker, I., & Štulhofer, A. (2020). Stability versus fluidity of adolescent romantic and sexual attraction and the role of religiosity: A longitudinal assessment in two independent samples of Croatian adolescents. *Archives of Sexual Behaviour*, 49, 1477-

1488. <https://doi.org/10.1007/s10508-020-01713-y>

Darcangelo, S. (2008). Fetishism: Psychopathology and theory. In D. R. Laws & W. T.

O’Donohue (Eds.), *Sexual deviance: Theory, assessment, and treatment* (pp. 108–118).

New York: Guilford Press.

Dawson, S. J., Huberman, J. S., Bouchard, K. N., McInnis, M. K., Pukall, C. F., & Chivers, M.

L. (2019). Effects of individual difference variables, gender, and exclusivity of sexual

attraction on volunteer bias in sexuality research. *Archives of Sexual Behaviour*, 48, 2403-2417. <https://doi.org/10.1007/s10508-019-1451-4>

Denny, S., Lucassen, M. F., Stuart, J., Fleming, T., Bullen, P., Peiris-John, R., Rossen, F. V., & Utter, J. (2016). The association between supportive high school environments and depressive symptoms and suicidality among sexual minority students. *Journal of Clinical Child & Adolescent Psychology*, 45, 248-261.

<https://doi.org/10.1080/15374416.2014.958842>

Diamond, L. M. (1998). Development of sexual orientation among adolescent and young adult women. *Developmental psychology*, 34, 1085. <https://doi.org/10.1037/0012-1649.34.5.1085>

\*Diamond, L. M. (2000). Sexual identity, attractions, and behavior among young sexual-minority women over a 2-year period. *Developmental Psychology*, 36, 241. <https://doi.org/10.1037/0012-1649.36.2.241>

Diamond, L. M. (2003a). New paradigms for research on heterosexual and sexual-minority development. *Journal of Clinical Child and Adolescent Psychology*, 32, 490–498. [https://doi.org/10.1207/S15374424JCCP3204\\_1](https://doi.org/10.1207/S15374424JCCP3204_1)

\*Diamond, L. M. (2003b). Was it a phase? Young women's relinquishment of lesbian/bisexual identities over a 5-year period. *Journal of Personality and Social Psychology*, 84, 352. <https://doi.org/10.1037//0022-3514.84.2.352>

\*Diamond, L. M. (2005). A new view of lesbian subtypes: Stable versus fluid identity trajectories over an 8-year period. *Psychology of Women Quarterly*, 29, 119-128. <https://doi.org/10.1111/j.1471-6402.2005.00174.x>

Diamond, L. M. (2008a). *Sexual fluidity*. Harvard University Press.

- \*Diamond, L. M. (2008b). Female bisexuality from adolescence to adulthood: results from a 10-year longitudinal study. *Developmental Psychology*, *44*, 5-14.  
<https://doi.org/10.1037/0012-1649.44.1.5>
- Diamond, L. M. (2016). Sexual fluidity in male and females. *Current Sexual Health Reports*, *8*, 249-256. <https://doi.org/10.4324/9781315697215-26>
- \*Diamond, L. M., Dickenson, J. A., & Blair, K. L. (2017). Stability of sexual attractions across different timescales: The roles of bisexuality and gender. *Archives of Sexual Behaviour*, *46*, 193-204. <https://doi.org/10.1007/s10508-016-0860-x>
- Diamond, L. M., & Rosky, C. J. (2016). Scrutinizing immutability: Research on sexual orientation and US legal advocacy for sexual minorities. *Journal of Sex Research*, *53*, 363-391. <https://doi.org/10.1080/00224499.2016.1139665>
- \*Dickson, N., Paul, C., & Herbison, P. (2003). Same-sex attraction in a birth cohort: Prevalence and persistence in early adulthood. *Social Science & Medicine*, *56*, 1607-1615.  
[https://doi.org/10.1016/S0277-9536\(02\)00161-2](https://doi.org/10.1016/S0277-9536(02)00161-2)
- \*Dickson, N., van Roode, T., Cameron, C., & Paul, C. (2013). Stability and change in same-sex attraction, experience, and identity by sex and age in a New Zealand birth cohort. *Archives of Sexual Behaviour*, *42*, 753-763. <https://doi.org/10.1007/s10508-012-0063-z>
- Dolnica, S. (2021). 5/7-Point 'Likert scales' aren't always the best option: Their validity is undermined by lack of reliability, response style bias, long completion times and limitations to permissible statistical procedures. *Annals of Tourism Research*, *91*.  
<https://doi.org/10.31235/osf.io/8p4yc>
- \*Doolin, H. N. (2014). *Sexual and relational satisfaction in mixed-orientation marriages* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses Full Text.

- Dubé, S., Santaguida, M., Anctil, D., Zhu, C. Y., Thomasse, L., Giaccari, L., Oassey, R., Vachon, D., & Johnson, A. (2023). Perceived stigma and erotic technology: From sex toys to erobots. *Psychology & Sexuality, 14*, 141-157.  
<https://doi.org/10.1080/19419899.2022.2067783>
- Earls, C. M., & Lalumière, M. L. (2002). A case study of preferential bestiality (zoophilia). *Sexual Abuse: A Journal of Research and Treatment, 14*, 83-88.  
<https://doi.org/10.1177/107906320201400106>
- Earls, C. M., & Lalumière, M. L. (2009). A case study of preferential bestiality. *Archives of Sexual Behaviour, 38*, 605-609. <https://doi.org/10.1007/s10508-007-9285-x>
- Exodus International (2007). *Policy Statements: Statement on Homosexuality*. Retrieved March 23, 2007, from <http://exodus.to/content/view/34/118>
- \*Farr, R. H., Diamond, L. M., & Boker, S. M. (2014). Female same-sex sexuality from a dynamical systems perspective: Sexual desire, motivation, and behavior. *Archives of Sexual Behaviour, 43*, 1477-1490. <https://doi.org/10.1007/s10508-014-0378-z>
- Fisher, W. A., & Kohut, T. (2020). Reading pornography: Methodological considerations in evaluating pornography research. *Journal of Sexual Medicine, 17*, 195-209.  
<https://doi.org/10.1016/j.jsxm.2019.11.257>
- Fu, T. C., Herbenick, D., Dodge, B., Owens, C., Sanders, S. A., Reece, M., & Fortenberry, J. D. (2019). Relationships among sexual identity, sexual attraction, and sexual behavior: Results from a nationally representative probability sample of adults in the United States. *Archives of Sexual Behaviour, 48*, 1483-1493. <https://doi.org/10.1007/s10508-018-1319-z>

- \*Gangestad, S. W., Garver-Apgar, C. E., Simpson, J. A., & Cousins, A. J. (2007). Changes in women's mate preferences across the ovulatory cycle. *Journal of Personality and Social Psychology, 92*, 151. <https://doi.org/10.1037/0022-3514.92.1.151>
- \*Garver-Apgar, C. E., Gangestad, S. W., Thornhill, R., Miller, R. D., & Olp, J. J. (2006). Major histocompatibility complex alleles, sexual responsivity, and unfaithfulness in romantic couples. *Psychological Science, 17*, 830-835. <https://doi.org/10.1111/j.1467-9280.2006.01789.x>
- Graham, C. A., Catania, J. A., Brand, R., Duong, T., & Canchola, J. A. (2003). Recalling sexual behavior: A methodological analysis of memory recall bias via interview using the diary as the gold standard. *Journal of Sex Research, 40*, 325-332. <https://doi.org/10.1080/00224490209552198>
- Gregory, A. M. (2009). *A comparison of bisexual women partnered with same or other-sex partners: Identity, assertion/disclosure of bisexual identity, cultural influences and experiences* [Doctoral dissertation, Alliant International University]. ProQuest Dissertations Publishing. <https://www.proquest.com/docview/275617005>
- Haldeman, D. C. (1994). The practice and ethics of sexual orientation conversion therapy. *Journal of Consulting and Clinical Psychology, 62*, 221. <https://doi.org/10.1037/0022-006X.62.2.221>
- Haldeman, D. C. (2002). Gay rights, patient rights: The implications of sexual orientation conversion therapy. *Professional Psychology: Research and Practice, 33*, 260. <https://doi.org/10.1037//0735-7028.33.3.260>

- Hammack, P. L., Frost, D. M., Meyer, I. H., & Pletta, D. R. (2018). Gay men's health and identity: Social change and the life course. *Archives of Sexual Behaviour*, *47*, 59-74. <https://doi.org/10.1007/s10508-017-0990-9>
- Harris, K. M., Halpern, C. T., Whitsel, E. A., Hussey, J. M., Killeya-Jones, L. A., Tabor, J., & Dean, S. C. (2019). Cohort Profile: The National Longitudinal Study of Adolescent to Adult Health (Add Health). *International Journal of Epidemiology*, *48*, 1415–1415k. <https://doi.org/10.1093/ije/dyz115>
- Hart, C.G., Saperstein, A., Magliozzi, D. & Westbrook, L. (2019) Gender and health: beyond binary categorical measurement. *Journal of Health and Social Behavior*, *60*, 101–118. <https://doi.org/10.1177/0022146519825749>
- Höglund, J., Jern, P., Sandnabba, N. K., & Santtila, P. (2014). Finnish women and men who self-report no sexual attraction in the past 12 months: Prevalence, relationship status, and sexual behavior history. *Archives of Sexual Behaviour*, *43*, 879-889. <https://doi.org/10.1007/s10508-013-0240-8>
- Hu, Y., Xu, Y., & Tornello, S. L. (2016). Stability of self-reported same-sex and both-sex attraction from adolescence to young adulthood. *Archives of Sexual Behaviour*, *45*, 651-659. <https://doi.org/10.1007/s10508-015-0541-1>
- Hunt, G., Wang, L., Bacani, N., Card, K., Sereda, P., Lachowsky, N., Roth, R., Hogg, R., Moore, D., & Armstrong, H. (2019). Generational differences in sexual behaviour and partnering among gay, bisexual, and other men who have sex with men. *Canadian Journal of Human Sexuality*, *28*, 215-225. <https://doi.org/10.3138/cjhs.2019-0014>

- Iasenza, S. (1991). *The relations among selected aspects of sexual orientation and sexual functioning in females* [Doctoral dissertation, New York University]. ProQuest Dissertations Publishing. <https://www.proquest.com/docview/303919703>
- Igartua, K., Thombs, B. D., Burgos, G., & Montoro, R. (2009). Concordance and discrepancy in sexual identity, attraction, and behavior among adolescents. *Journal of Adolescent Health, 45*, 602-608. <https://doi.org/10.1016/j.jadohealth.2009.03.019>
- Johns, M. M., Zimmerman, M., & Bauermeister, J. A. (2013). Sexual attraction, sexual identity, and psychosocial wellbeing in a national sample of young women during emerging adulthood. *Journal of Youth and Adolescence, 42*, 82-95. <https://doi.org/10.1007/s10964-012-9795-2>
- \*Jones, S. L., & Yarhouse, M. A. (2011). A longitudinal study of attempted religiously mediated sexual orientation change. *Journal of Sex & Marital Therapy, 37*, 404-427. <https://doi.org/10.1080/0092623X.2011.607052>
- Kaestle, C. E. (2019). Sexual orientation trajectories based on sexual attractions, partners, and identity: A longitudinal investigation from adolescence through young adulthood using a US representative sample. *Journal of Sex Research, 56*, 811-826. <https://doi.org/10.1080/00224499.2019.1577351>
- Kafka, M. P. (2010). The DSM diagnostic criteria for fetishism. *Archives of Sexual Behaviour, 39*, 357-362. <https://doi.org/10.1007/s10508-009-9558-7>
- Kassis, W., Aksoy, D., Favre, C. A., & Artz, S. T. G. (2021). Multidimensional and intersectional gender identity and sexual attraction patterns of adolescents for quantitative research. *Frontiers in Psychology, 12*, 4068. <https://doi.org/10.3389/fpsyg.2021.697373>

- Katz-Wise, S. L. (2015). Sexual fluidity in young adult women and men: Associations with sexual orientation and sexual identity development. *Psychology & Sexuality, 6*, 189-208. <https://doi.org/10.1080/19419899.2013.876445>
- Katz-Wise, S. L., & Hyde, J. S. (2015). Sexual fluidity and related attitudes and beliefs among young adults with a same-gender orientation. *Archives of Sexual Behaviour, 44*, 1459-1470. <https://doi.org/10.1007/s10508-014-0420-1>
- Katz-Wise, S. L., Reisner, S. L., Hughto, J. W., & Keo-Meier, C. L. (2016). Differences in sexual orientation diversity and sexual fluidity in attractions among gender minority adults in Massachusetts. *Journal of Sex Research, 53*, 74-84. <https://doi.org/10.1080/00224499.2014.1003028>
- Katz-Wise, S. L., & Todd, K. P. (2022). The current state of sexual fluidity research. *Current Opinion in Psychology, 101497*. <https://doi.org/10.1016/j.copsyc.2022.101497>
- \*Katz-Wise, S. L., Williams, D. N., Keo-Meier, C. L., Budge, S. L., Pardo, S., & Sharp, C. (2017). Longitudinal associations of sexual fluidity and health in transgender men and cisgender women and men. *Psychology of Sexual Orientation and Gender Diversity, 4*, 460. <https://doi.org/10.1037/sgd0000246>
- Kauth, M. R. (2000). *True nature: A theory of sexual attraction*. Springer Science & Business Media. <https://doi.org/10.1007/978-1-4615-4301-5>
- Kenrick, D. T., & Keefe, R. C. (1992). Age preferences in mates reflect sex differences in human reproductive strategies. *Behavioral and Brain Sciences, 15*, 75-91. <https://doi.org/10.1017/S0140525X00067595>

- Kinnish, K. K., Strassberg, D. S., & Turner, C. W. (2005). Sex differences in the flexibility of sexual orientation: A multidimensional retrospective assessment. *Archives of Sexual Behaviour, 34*, 173-183. <https://doi.org/10.1007/s10508-005-1795-9>
- Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. Philadelphia: W. B. Saunders.
- Klein, F., Sepekoff, B., & Wolf, T. J. (1985). Sexual orientation: A multi-variable dynamic process. *Journal of Homosexuality, 11*, 35-49. [https://doi.org/10.1300/J082v11n01\\_04](https://doi.org/10.1300/J082v11n01_04)
- Kohut, T., Balzarini, R. N., Fisher, W. A., Grubbs, J. B., Campbell, L., & Prause, N. (2020). Surveying pornography use: A shaky science resting on poor measurement foundations. *Journal of Sex Research, 57*, 722-742. <https://doi.org/10.1080/00224499.2019.1695244>
- Levy, D. (2009). *Love and sex with robots: The evolution of human-robot relationships*. New York.
- Li, L., Smith, H. E., Atun, R., & Car, L. T. (2019). Search strategies to identify observational studies in MEDLINE and Embase. *Cochrane Database of Systematic Reviews, 3*. <https://doi.org/10.1002/14651858.MR000041.pub2>
- \*Manley, M. H., Diamond, L. M., & van Anders, S. M. (2015). Polyamory, monoamory, and sexual fluidity: A longitudinal study of identity and sexual trajectories. *Psychology of Sexual Orientation and Gender Diversity, 2*, 168. <https://doi.org/10.1037/sgd0000098>
- Mark, K. P., & Herbenick, D. (2014). The influence of attraction to partner on heterosexual women's sexual and relationship satisfaction in long-term relationships. *Archives of Sexual Behaviour, 43*, 563-570. <https://doi.org/10.1007/s10508-013-0184-z>

- McClintock, M. K., & Herdt, G. (1996). Rethinking puberty: The development of sexual attraction. *Current Directions in Psychological Science*, 5, 178-183.  
<https://doi.org/10.1111/1467-8721.ep11512422>
- McHugh, M. L. (2012). Interrater reliability: the kappa statistic. *Biochemia Medica*, 22, 276-282.  
<https://doi.org/10.11613/BM.2012.031>
- Mock, S. E., & Eibach, R. P. (2012). Stability and change in sexual orientation identity over a 10-year period in adulthood. *Archives of Sexual Behaviour*, 41, 641-648.  
<https://doi.org/10.1007/s10508-011-9761-1>
- Money, J. (1986). *Lovemaps: Clinical concepts of sexual/erotic health and pathology, paraphilia, and gender transposition of childhood, adolescence, and maturity*. Amherst, NY: Prometheus.
- Morales Knight, L. F., & Hope, D. A. (2012). Correlates of same-sex attractions and behaviors among self-identified heterosexual university students. *Archives of Sexual Behaviour*, 41, 1199-1208. <https://doi.org/10.1007/s10508-012-9927-5>
- Morandini, J. S., Dacosta, L., & Dar-Nimrod, I. (2021). Exposure to continuous or fluid theories of sexual orientation leads some heterosexuals to embrace less-exclusive heterosexual orientations. *Scientific Reports*, 11, 16546. <https://doi.org/10.1038/s41598-021-94479-9>
- National Heart, Lung, and Blood Institute (2021, July). *Study quality assessment tools*. <https://www.nhlbi.nih.gov/health-topics/study-quality-assessment-tools>
- Needham, B. L. (2012). Sexual attraction and trajectories of mental health and substance use during the transition from adolescence to adulthood. *Journal of Youth and Adolescence*, 41, 179-190. <https://doi.org/10.1007/s10964-011-9729-4>

- Ott, M. Q., Corliss, H. L., Wypij, D., Rosario, M., & Austin, S. B. (2011). Stability and change in self-reported sexual orientation identity in young people: Application of mobility metrics. *Archives of Sexual Behavior, 40*, 519-532. <https://doi.org/10.1007/s10508-010-9691-3>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamsee, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., Macdonald, S., McGuinness, L. A., Stewart, L. A., Thomas, J., Tricco, A. C., Welch, V. A., & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *International Journal of Surgery, 88*, 105906. <https://doi.org/10.1016/j.ijssu.2021.105906>
- Pampel, F. C. (2016). Cohort changes in the social distribution of tolerant sexual attitudes. *Social Forces, 95*, 753-777. <https://doi.org/10.1093/sf/sow069>
- Panozzo, D. (2013). Advocating for an end to reparative therapy: Methodological grounding and blueprint for change. *Journal of Gay & Lesbian Social Services, 25*, 362-377. <https://doi.org/10.1080/10538720.2013.807214>
- \*Petit, M. P., Blais, M., & Hébert, M. (2021a). Prevalence, co-occurrence, and recurrence of teen dating violence across dimensions of sexual orientation: A longitudinal study using a representative sample of adolescents. *Psychology of Violence, 11*, 175. <https://doi.org/10.1037/vio0000349>
- \*Petit, M. P., Blais, M., & Hébert, M. (2021b). Dating violence victimization disparities across sexual orientation of a population-based sample of adolescents: An adverse childhood

- experiences perspective. *Psychology of Sexual Orientation and Gender Diversity*, 10, 217-231. <https://doi.org/10.1037/sgd0000518>
- Rees, G., & Garcia, J. R. (2017). An investigation into the solitary and interpersonal aspects of sexual object fetishism: A mixed-methods approach. *Psychology & Sexuality*, 8, 252-267. <https://doi.org/10.1080/19419899.2017.1383301>
- Roberson, P. K., Shema, S. J., Mundfrom, D. J., & Holmes, T. M. (1995). Analysis of paired Likert data: how to evaluate change and preference questions. *Family Medicine*, 27, 671-675.
- Rosario, M., Schrimshaw, E. W., Hunter, J., & Braun, L. (2006). Sexual identity development among lesbian, gay, and bisexual youths: Consistency and change over time. *Journal of Sex Research*, 43, 46-58. <https://doi.org/10.1080/00224490609552298>
- Rosman, J. P., & Resnick, P. J. (1989). Sexual attraction to corpses: A psychiatric review of necrophilia. *Journal of the American Academy of Psychiatry and the Law Online*, 17, 153-163.
- Rostosky, S. S., Owens, G. P., Zimmerman, R. S., & Riggle, E. D. (2003). Associations among sexual attraction status, school belonging, and alcohol and marijuana use in rural high school students. *Journal of Adolescence*, 26, 741-751. <https://doi.org/10.1016/j.adolescence.2003.09.002>
- Russell, S. T., Driscoll, A. K., & Truong, N. (2002). Adolescent same-sex romantic attractions and relationships: Implications for substance use and abuse. *American Journal of Public Health*, 92, 198-202. <https://doi.org/10.2105/AJPH.92.2.198>

- Sager, J. B. (2005). *A psychometric examination of the Klein Sexual Orientation Grid: What does it measure?* [Doctoral dissertation, The Pennsylvania State University]. ProQuest Dissertations Publishing. <https://www.proquest.com/docview/305452811>
- Savin-Williams, R. C. (2014). An exploratory study of the categorical versus spectrum nature of sexual orientation. *Journal of Sex Research, 51*, 446–453.  
<https://doi.org/10.1080/00224499.2013.871691>
- Savin-Williams, R. C., & Cohen, K. M. (2015). Developmental trajectories and milestones of lesbian, gay, and bisexual young people. *International Review of Psychiatry, 27*(5), 357-366. <https://doi.org/10.3109/09540261.2015.1093465>
- Savin-Williams, R. C., Joyner, K., & Rieger, G. (2012). Prevalence and stability of self-reported sexual orientation identity during young adulthood. *Archives of Sexual Behaviour, 41*, 103-110. <https://doi.org/10.1007/s10508-012-9913-y>
- Savin-Williams, R. C., & Ream, G. L. (2007). Prevalence and stability of sexual orientation components during adolescence and young adulthood. *Archives of Sexual Behaviour, 36*, 385-394. <https://doi.org/10.1007/s10508-006-9088-5>
- Schroder, K. E., Carey, M. P., & Venable, P. A. (2003). Methodological challenges in research on sexual risk behavior: II. Accuracy of self-reports. *Annals of Behavioral Medicine, 26*, 104-123. [https://doi.org/10.1207/S15324796ABM2602\\_03](https://doi.org/10.1207/S15324796ABM2602_03)
- Sell, R. L. (1997). Defining and measuring sexual orientation: A review. *Archives of Sexual Behaviour, 26*, 643-658. <https://doi.org/10.1023/A:1024528427013>
- Seto, M. C. (2017). The puzzle of male chronophilias. *Archives of Sexual Behaviour, 46*, 3-22.  
<https://doi.org/10.1007/s10508-016-0799-y>

- Shively, M. G., & De Cecco, J. P. (1977). Components of sexual identity. *Journal of Homosexuality*, 3, 41-48. [https://doi.org/10.1300/J082v03n01\\_04](https://doi.org/10.1300/J082v03n01_04)
- \*Spittlehouse, J. K., Boden, J. M., & Horwood, L. J. (2020). Sexual orientation and mental health over the life course in a birth cohort. *Psychological Medicine*, 50, 1348-1355. <https://doi.org/10.1017/S0033291719001284>
- Spitzer, R. L. (2003). Can some gay men and lesbians change their sexual orientation? 200 participants reporting a change from homosexual to heterosexual orientation. *Archives of Sexual Behaviour*, 32, 403-417. <https://doi.org/10.1023/A:1025647527010>
- Stokes, J. P., Damon, W., & McKirnan, D. J. (1997). Predictors of movement toward homosexuality: A longitudinal study of bisexual men. *Journal of Sex Research*, 34, 304-312. <https://doi.org/10.1080/00224499709551896>
- Talari, K., & Goyal, M. (2020). Retrospective studies—utility and caveats. *Journal of the Royal College of Physicians of Edinburgh*, 50, 398-402. <https://doi.org/10.4997/jrcpe.2020.409>
- \*Talley, A. E., Sher, K. J., & Littlefield, A. K. (2010). Sexual orientation and substance use trajectories in emerging adulthood. *Addiction*, 105, 1235-1245. <https://doi.org/10.1111/j.1360-0443.2010.02953.x>
- \*Talley, A. E., Sher, K. J., Steinley, D., Wood, P. K., & Littlefield, A. K. (2012). Patterns of alcohol use and consequences among empirically derived sexual minority subgroups. *Journal of Studies on Alcohol and Drugs*, 73, 290-302. <https://doi.org/10.15288/jsad.2012.73.290>
- \*Talley, A. E., Aranda, F., Hughes, T. L., Everett, B., & Johnson, T. P. (2015). Longitudinal associations among discordant sexual orientation dimensions and hazardous drinking in a

- cohort of sexual minority women. *Journal of Health and Social Behavior*, 56, 225-245.  
<https://doi.org/10.1177/0022146515582099>
- Timmins, L., Rimes, K. A., & Rahman, Q. (2021). Is being queer gay? Sexual attraction patterns, minority stressors, and psychological distress in non-traditional categories of sexual orientation. *Journal of Sex Research*, 58, 599-611.  
<https://doi.org/10.1080/00224499.2020.1849527>
- Twenge, J. M., Sherman, R. A., & Wells, B. E. (2016). Changes in American adults' reported same-sex sexual experiences and attitudes, 1973–2014. *Archives of Sexual Behavior*, 45, 1713-1730. <https://doi.org/10.1007/s10508-016-0769-4>
- van Anders, S. M. (2015). Beyond sexual orientation: Integrating gender/sex and diverse sexualities via sexual configurations theory. *Archives of Sexual Behaviour*, 44, 1177-1213. <https://doi.org/10.1007/s10508-015-0490-8>
- Ventriglio, A., & Bhugra, D. (2019). Sexuality in the 21st century: Sexual fluidity. *East Asian Archives of Psychiatry*, 29, 30-34. <https://doi.org/10.12809/eaap1736>
- Veritas Health Innovation (2022). Covidence systematic review software [Internet]. Melbourne, Australia. [www.covidence.org](http://www.covidence.org)
- Vinogradov, A. E. (1998). Male reproductive strategy and decreased longevity. *Acta Biotheoretica*, 46, 157-160. <https://doi.org/10.1023/A:1001181921303>
- Visser, R. O. D., Smith, A. M., Richters, J., & Rissel, C. E. (2007). Associations between religiosity and sexuality in a representative sample of Australian adults. *Archives of Sexual Behaviour*, 36, 33-46. <https://doi.org/10.1007/s10508-006-9056-0>

- Weinberg, M. S., Williams, C. J., & Pryor, D. W. (1995). *Dual attraction: Understanding bisexuality*. Oxford University Press.  
<https://doi.org/10.1093/oso/9780195084825.001.0001>
- Weinrich, J. D. (2014). Multidimensional measurement of sexual orientation: Ideal. *Journal of Bisexuality, 14*, 544-556. <https://doi.org/10.1080/15299716.2014.960958>
- Williams, C. J., & Weinberg, M. S. (2003). Zoophilia in men: A study of sexual interest in animals. *Archives of Sexual Behaviour, 32*, 523-535.  
<https://doi.org/10.1023/A:1026085410617>
- \*Yarhouse, M. A., Gow, C. H., & Davis, E. B. (2009). Intact marriages in which one partner experiences same-sex attraction: A 5-year follow-up study. *The Family Journal, 17*, 329-334. <https://doi.org/10.1177/1066480709347361>
- \*Yarhouse, M. A., & Seymore, R. L. (2006). Intact marriages in which one partner dis-identifies with experiences of same-sex attraction: A follow-up study. *The American Journal of Family Therapy, 34*, 151-161. <https://doi.org/10.1080/01926180500301568>
- Yoneda, A. (2010). *A nuanced perspective of sexual orientation and its relationship with well-being: Differentiating sexual and non-sexual attractions in heterosexual and sexual minority women and men*. State University of New York at Stony Brook.
- Zheng, L., & Su, Y. (2018). Patterns of asexuality in China: Sexual activity, sexual and romantic attraction, and sexual desire. *Archives of Sexual Behaviour, 47*, 1265-1276.  
<https://doi.org/10.1007/s10508-018-1158-y>
- Zidenberg, A. M., & Olver, M. E. (2022). Measurement and correlates of zoophilic interest in an online community sample. *Archives of Sexual Behaviour, 51*, 4179-4193.  
<https://doi.org/10.1007/s10508-022-02429-x>

Zietsch, B. P., & Sidari, M. J. (2020). The Kinsey scale is ill-suited to most sexuality research because it does not measure a single construct. *Proceedings of the National Academy of Sciences - PNAS*, *117*, 27080–27080.

<https://doi.org/10.1073/pnas.2015820117>

**Table 2. 1***Inclusion and Exclusion Criteria for Title and Abstract Screening.*

Criteria	Inclusion	Exclusion
Language	Must be in English or French.	Non-English and non-French.
Type of study	Must be an empirical study.	Non-empirical studies (i.e., narrative reviews).
Population	Must include human adolescents (16 years old) and older.	Participants who are children below 16 years old.
	Must be from a non-clinical sample.	Includes animals as subjects. Studies with only a clinical sample.
Focus of paper	Must focus on sexual attraction or a construct directly related to or synonymous with sexual attraction.	Subjects that are not related to sexual attraction.

**Table 2. 2***Inclusion and Exclusion Criteria for Full-Text Screening.*

Criteria	Inclusion	Exclusion
Text availability	Full text was available or available upon request.	Full text was not available or authors that were contacted did not reply/replied that the paper was unavailable.
Peer-reviewed	Peer-reviewed or a dissertation found in a database.	Any publications that are not peer-reviewed or published dissertations.
Methods used to study sexual attraction	Must use self-report methods of study sexual attraction (surveys, interviews, etc.).	Do not use self-report methods to study sexual attraction.
Focus of the paper	Must clearly measure sexual attraction.  May use scales or subscales to measure sexual attraction or may ask questions pertaining to sexual attraction.	Paper does not clearly measure sexual attraction.
Time points of assessment	Must measure sexual attraction across multiple time points.  Must examine the same participants over multiple prospective time points.	Do not measure sexual attraction across multiple time points.  Do not examine the same participants over multiple prospective time points.

**Table 2.3***Included Studies.*

Original study	Overlapping sample	Country	N	Sample description	Coded sexual orientation label for sample	Measure used	Time between measurements (in days, approximated)	Evidence of change
Caflich (2013)*		USA	40	Sampled from general public, all female	Mostly bisexual cisgender women	Modified Kinsey scale	365 - 425	+
Cohen et al. (2020)*#		CR	1,844	Sampled from youth/students, mixed gender/sex sample	Mostly heterosexual cisgender men and women	Modified Kinsey scale	480 - 730	+
Diamond (2000)		USA	80	Sampled from general public, all female	Completely non-heterosexual cisgender women	Diamond Pie Chart	730	+
→	Diamond (2003b)		80				1825	+
→	Diamond (2005)		79				2920	+
→	Diamond (2008b)*#		79				3650	+
→	Farr et al. (2014)		33				21	+
Diamond et al. (2017)*		USA	294	Sampled from general public, mixed gender/sex sample	Mixed homosexual, heterosexual, and bisexual cisgender men and women	Rate intensity of attraction on a 1-10 scale	30	+

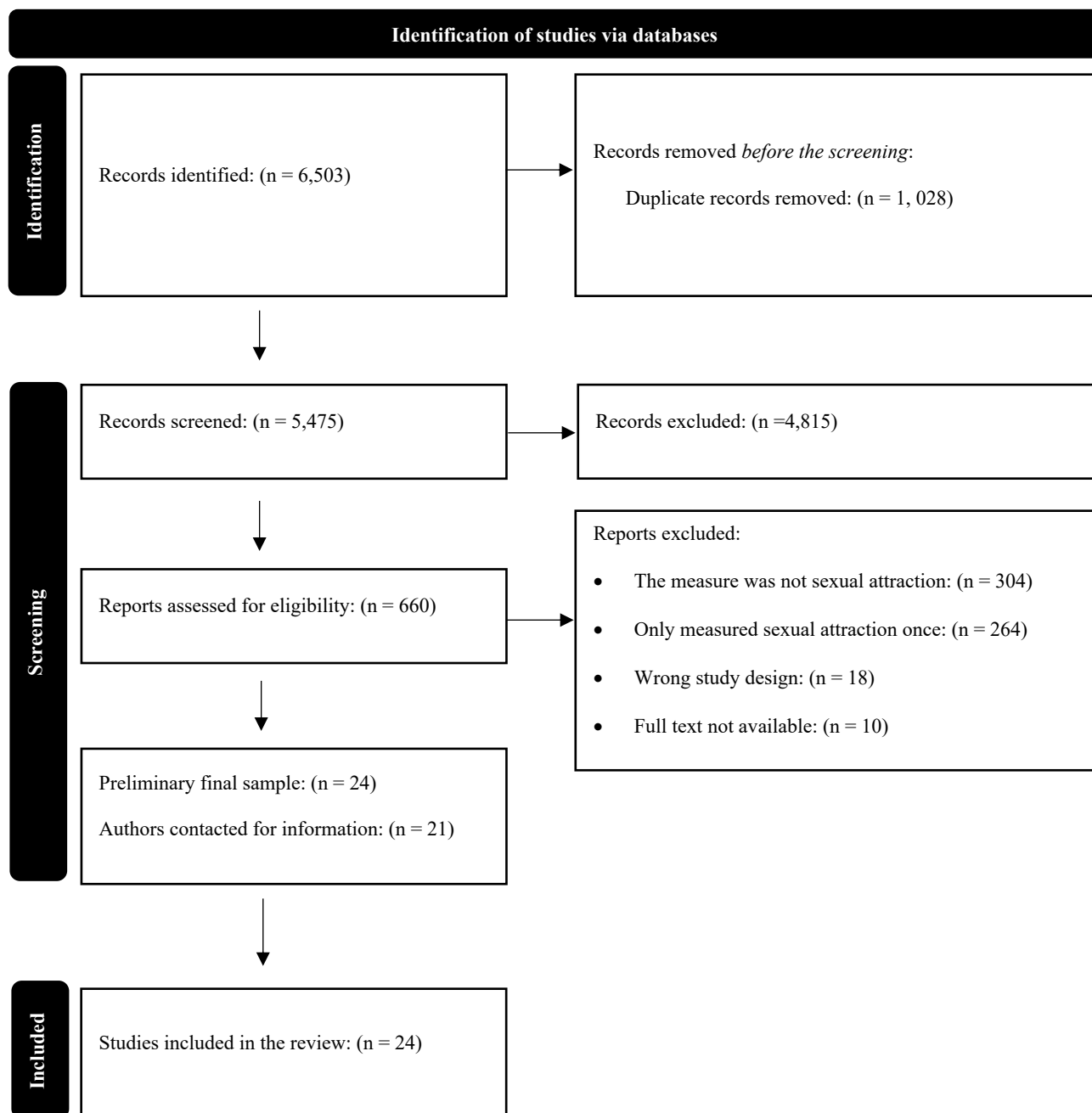
Dickson et al. (2003)	NZ	958	Sampled from general public, mixed gender/sex sample	Near even mix of mostly heterosexual cisgender men and women	Modified Kinsey scale	1825	+
→	Dickson et al. (2013)*	924				6205	+
Doolin (2014)*	USA	41	Sampled from general public, mixed gender/sex sample	Completely sexual minority cisgender men and women	YSOT	365	-
Gangestad et al. (2005)*	USA	108	Samples from university students, mixed gender/sex sample	Even mix of heterosexual cisgender men and women	Five-point Likert of frequency of agreement with statements about attraction to partner	2 - 14	+
→	Garver-Apgar et al. (2006)	96				2 - 14	+
Jones & Yarhouse (2011)*#	USA	98	Sampled from religious groups who were trying to change attractions but not clinical sample, mixed gender/sex sample.	Mostly homosexual cisgender men	Kinsey scale and Shively and DeCecco Scale	2373	+
Katz-Wise et al. (2017)*#	USA	140	Sampled from general public, mixed gender/sex sample	Mix of mostly heterosexual transgender men, cisgender men, and cisgender women	Four categorical options (e.g., men, women) for who participants were sexually attracted to	365	+
Manley et al. (2015)*#	USA	116	Sampled from general public, mixed gender/sex sample	Mostly heterosexual cisgender female	KSOG	212	+
Petit et al. (2021a)*#	CA	4,691	Samples from youth/students, mixed gender/sex sample	Mostly heterosexual cisgender girls/women	Modified Kinsey scale	183	+
→	Petit et al. (2021b)	4,597				183	+

Spittlehouse et al. (2020)*#	NZ	1,040	Sampled from general public, mixed gender/sex sample	Mix of heterosexual cisgender males and females	Modified Kinsey scale	3650	+
Talley et al. (2010)	USA	2,854	Sampled from university students, mixed gender/sex sample	Mix of sexual minority and heterosexual cisgender men and women	Modified Kinsey scale	1460	+
→	Talley et al. (2012)*	2,068				1460	+
Talley et al. (2015)*	USA	447	Sampled from general public, all female	Completely homosexual cisgender women	Modified Kinsey scale	3650	+
Yarhouse et al. (2006)	USA	15	Samples from religious groups, mixed gender/sex sample	Even mix of heterosexual cisgender men and women <sup>a</sup>	YSOT	365	+
→	Yarhouse et al. (2009)*	13				1825	+

Note. “USA” = United States of America, “CR” = Croatia, “CA” = Canada, “NZ” = New Zealand. “\*” Indicates that the study was included as a “primary study”; “#” indicates that the study sample was included in the pooled sample to calculate how many participants experienced changes; “+” indicates the presence of evidence; “-” indicates that evidence was not present and authors, when contacted, indicated that they did not have any further data/information; “<sup>a</sup>” although this sample identified as heterosexual, half of the sample were referred to as “strugglers” who experienced non-heterosexual attraction.

Figure 2. 1

*PRISMA Diagram of Systematic Review.*



**Chapter 3: Psychometric Evaluation of a Novel Measure of Sexual Attraction:  
The Sexual Attraction Inventory**

### Abstract

This study aimed to evaluate the measurement properties of the Sexual Attraction Inventory (SAI), a new measure of sexual attraction to diverse stimuli (e.g., genders, ages, sexual acts) that might be sensitive to changes (fluidity) over time. The SAI integrates research from the sexual orientation and the paraphilia literatures to provide a more comprehensive and dynamic assessment of sexual attractions than what is currently available. The 40-item inventory was administered to 670 university students three times (at baseline, two weeks later, and six months later) to evaluate its psychometric properties (i.e., convergent and divergent validity, test-retest reliability, factor structure, and face validity) and ability to detect change. Results showed evidence of convergent validity with a Kinsey scale, divergent validity with a measure of social desirability, and acceptable two-week test-retest reliability for 32 out of 40 items. The exploratory factor analysis of the reliable items resulted in a five-factor structure explaining 64% of the variance. The SAI showed face validity with high participant agreement on its effectiveness, acceptability, and clarity. The SAI detected changes over the six-month period, particularly for sexual attractions related to dominance and submissiveness. We conclude that the SAI is a viable tool for measuring diverse sexual attractions and can be used to explore the diverse and potentially fluid nature of sexual attraction. We caution about the reliability of low-endorsement items.

*Keywords:* Sexual attraction, measurement, sexual fluidity, paraphilia, sexual orientation

Sexual attraction has been defined in numerous ways; “feeling aroused by someone whom you find attractive” (Diamond et al., 2017, p. 196), “the degree of sexual desire toward individuals of the same sex and opposite sex” (Legate & Rogge, 2019, p. 1404), or “the kind of people you’re attracted to” (as reported by participants in Friedman et al., 2004, p. 308). Two instruments commonly used to measure sexual attraction, the Kinsey scale (Kinsey et al., 1948) and the Klein Sexual Orientation Grid (Klein et al., 1985), do not specifically define sexual attraction but rather situate the construct as a component of sexual orientation. However, sexual orientation represents a collective of one’s identity, attraction, and behavior and is generally more stable than attractions themselves (Bailey, 2009; van Anders, 2015). There is a need for measures of sexual attraction that go beyond a sexual orientation framework and assess sexual attractions to more diverse stimuli with many response options. The current study aims to evaluate such a measure.

### **The Self-Report Method of Measuring Sexual Attraction**

Sexual attraction is most often assessed through self-report, but numerous alternative and useful methodologies exist, such as plethysmography (e.g., Huberman & Chivers, 2015; Prause & Janssen, 2006; Sawatsky et al., 2021), viewing time tasks of sexual interest (e.g., Dawson & Chivers, 2019; Israel & Strassberg, 2009; Quinsey et al., 1996), and implicit association tasks (e.g., Babchishin et al., 2013). The self-report measures are generally more practical (Paulhus & Vazire, 2007) and give participants an active choice in representing their experiences.

There are numerous self-report measures of sexual attraction. One of the best known is the Kinsey scale (Kinsey et al., 1948), which prompts participants to assign a value along a 7- or 8-point scale of sexual attractions to men and/or women. Another common measure is the Klein Sexual Orientation Grid (KSOG; Klein et al., 1985), which functions similarly with its seven

response options about men and/or women; the KSOG includes seven concepts (e.g., sexual attraction, sexual fantasies, self-identification) assessed across three temporal dimensions (i.e., past, present, and ideal). Other self-report measures like the Quebec Youth Risk Behaviour Survey (with added items as per Igartua et al., 2009), the Relationship Rating Form (and the adaptation made by Kaplan and Keys; Davis, 2001; Davis & Todd, 1982; Kaplan & Keys, 1997), and the Sexual Attraction Questionnaire (F ernandez et al., 2006), follow a similar approach, defining sexual attraction in terms of gender-preferences. These measures, like the Kinsey scale and KSOG, assess sexual attraction within a sexual orientation framework (Busseri et al., 2008; Cohen et al., 2020; Fu et al., 2019; Johns et al., 2013; Martijn et al., 2020).

Thus, self-report measures of sexual attraction predominantly focus on the gender to which people are attracted. Accordingly, novel measures of sexual attraction could expand to include other targets of sexual attraction. Notably, there are various documented paraphilias characterized by sexual attractions or interests to targets beyond gender. Examples include attractions to objects, as seen in fetishism (e.g., Rees & Garcia, 2017), contexts, such as voyeurism (e.g., Joyal & Carpentier, 2017), and to other characteristics of people, as observed in pedophilia (e.g., Martijn et al., 2020). Accordingly, some self-report measures used by researchers to measure paraphilias have, to some extent, captured sexual attractions outside of just gender preference and to multiple targets (e.g., questions drafted by Wibowo et al., 2022).

The measurement of sexual attraction is largely split between two separate bodies of literature. While the Kinsey scales and KSOGs are often discussed in the sexual orientation literature, measures of sexual attractions to non-gender targets are typically found within the paraphilia literature. Despite some overlaps between these two bodies of literature (e.g., Cantor, 2012; Seto, 2012), they are distinct and are often discussed in separate journals or within

different intellectual traditions. Integrating research on sexual attractions from sexual orientation literature, with a specific emphasis on diverse target stimuli explored in paraphilia literature, holds promise for the development of novel self-report measures of sexual attraction.

Self-report measures of sexual attraction are not typically used to measure change over time. Sexual attraction, however, can and does seem to change with time for some people (e.g., Diamond, 2016; reviewed in Walters et al., 2025). Some measures, like the KSOG, include a “past,” “present,” and “ideal” grid but still provide static snapshots (i.e., how the participant would rate these attractions at the time of assessment) and are not often used in prospective longitudinal designs. A novel measure sensitive to changes over time might be valuable for researchers interested in sexual stability or in sexual fluidity (e.g., Diamond, 2008). The aim of this study is to evaluate a measure that can be used in longitudinal designs following an assessment of test-retest reliability and sensitivity to measure reliable change.

Self-report measures are susceptible to response biases, notably when measuring components of human sexuality (Dawson et al., 2019). One of these biases is social desirability, which refers to the tendency for people to self-present in a generally favorable light (Holden & Passey, 2009). Social desirability and the potential underreporting of atypical (e.g., paraphilic) attractions may impact the validity of self-report measures (Carvalho et al., 2020). Therefore, it is important for novel measures of sexual attraction to consider how participants respond to items. When developing such a measure, researchers can include measures of social desirability and provide participants with assurance about how their data on atypical/paraphilic attractions will be managed. Evidence of a weak correlation between social desirability and the measure of sexual attraction might increase confidence in the validity of the results.

### **Current Study**

This study explored the psychometric properties of a novel measure of sexual attraction, the Sexual Attraction Inventory (SAI). First, we report descriptive statistics of the sample, including mean sexual attraction scores from the SAI and the correlation with a measure of social desirability (divergent validity). Social desirability was used to evaluate divergent validity as it was hypothesized that it would not show a high degree of correlation with sexual attraction, as per the results of previous research using comparable designs with a measure of social desirability and the Kinsey scale (Meston et al., 1998). Second, we examined the convergent validity of the SAI by correlating gender-based items with the Kinsey scale, predicting a high correlation between analogous items. Thirdly, we examined the test-retest reliability of the SAI over a short period (two weeks, Time 2) in which sexual attractions were hypothesized not to change very much. Fourth, we evaluated changes in sexual attractions between baseline (i.e., Time 1) and a 6-month follow-up (i.e., Time 3). Based on the results from Walters et al. (2025), we expected to observe a change in approximately a fifth of participants, with varying magnitudes across items. Fifth, we evaluated the factor structure of the SAI as an exploratory analysis to assess whether the SAI captured patterns of sexual attractions in understandable ways. The SAI is intended to be used as an item-by-item inventory, but evaluating its potential factor structure helps determine whether the measure functions in understandable and predictable ways. Lastly, the face validity of the SAI was evaluated by asking participants to rate the measure's effectiveness, acceptability, and understandability.

## **Method**

### **Participants**

Before data cleaning, 715 students between 16 and 63 years of age ( $M = 19.40$ ,  $SD = 3.12$ ) were recruited from a large Canadian university for a three-part online survey of sexual

attractions in January 2023. Participants who did not respond to key variables (i.e., the Kinsey scale and SAI;  $n = 27$ ) or those who failed the honesty, attention, and effort checks ( $n = 18$ ) were removed. This left 670 participants at baseline ( $M = 19.40$ ,  $SD = 3.19$ , range = 16 to 63), 332 at the second assessment 2 weeks later ( $M = 19.55$ ,  $SD = 3.04$ , range = 16 to 47), and 146 at the third assessment 6 months later ( $M = 20.31$ ,  $SD = 3.35$ , range = 18 to 49). Participant sociodemographic information for each time point is presented in Table 3.1. At baseline, the sample was mostly cisgender (96%), gender binary (98%), heterosexual (65%), women (79%), and single (66%).

### **Measures**

At each time point, participants completed a brief sociodemographic questionnaire that assessed their gender (using the Gender/Sex 3x3; Beischel et al., 2022), age, sexual orientation labels (e.g., heterosexual, pansexual, queer, questioning, etc.), and relationship status. Participant age was assessed using a visual analog scale like the one used in the SAI, which gave participants practice using the sliding scale to indicate their age (the response option numbers were visible to them for this item).

### ***Sexual Attraction Inventory (SAI)***

The SAI is a 40-item self-report measure developed in multiple stages by the authors. It is intended to be used as an item-by-item inventory for evaluating changes in sexual attractions to diverse stimuli. Items were originally developed following a systematic review of changes in sexual attraction (Walters et al., 2025). Items in the SAI were drafted to represent three groups of stimuli that are most studied within the sexual attraction and paraphilia literatures (attraction to genders, ages, and actions/objects; Beier et al., 2005). These items are listed and numbered in Table 3. 2.

The gender group includes three items, two of which (i.e., “people who present as men” and “people who present as women”) represent a version of the typical anchors included in measures like the Kinsey scale. The third item (i.e., “people who present as a gender outside the binary of men/women”) includes diverse gender identities to expand upon previous research's binary options (e.g., man or woman; Su & Zheng, 2022).

The age group was informed by Seto’s analysis of age-based chronophilias (2017) and consists of eight items. These items range from “babies (0-11 months)” to “senior adults (65+)” with the goal of representing the human lifespan in discrete stages.

The paraphilia group comprises items from the Paraphilia Scale, as used by Seto et al. (2012) and Dawson et al. (2016). In their study, Dawson et al. administered the 40-item Paraphilia Scale to a nonclinical sample of more than 1,000 participants. They extracted data from 32 of the 40 items of the Paraphilia Scale that directly asked about paraphilic activities. The authors of the present study reviewed these 40 items and removed 11 items to reduce redundancy (i.e., some items were already included in the SAI as part of the age items) and to maximize relevance (i.e., Dawson et al. reported that several items may not be directly related to a paraphilia). The 29 remaining items included most of the original wording with minor revisions (e.g., where some items asked participants if they would like to dress as the “opposite sex,” we replaced this with “other genders”). The Supplemental Materials show how each item from the Paraphilia Scale was translated into the SAI and provide a rationale for any changes made to each item.

Participants were provided with a definition of sexual attraction at the beginning of the SAI to reduce misunderstanding related to the overlap between attraction and other phenomena (e.g., Austin et al., 2007). This definition was written to be easily understood by the public. It

was adapted from a formal definition reported in a systematic review of the literature on changes in sexual attractions (Walters et al., 2025): “anything that you feel attracted or pulled towards in a sexual way.” To differentiate sexual attraction from sexual identity and orientation, participants were given examples of diverse stimuli that they may be attracted to, such as specific objects, actions, and senses. They were also given specific examples of how sexual attraction differs from sexual arousal, desire, and fantasy. See Figure 3.1 for a depiction of how the SAI was presented to participants (i.e., definition, differentiation with other constructs, and instructions).

Following the definition, participants were instructed to rate their sexual attraction to each item by moving a 1-point slider along a 100-point visual analog unidimensional scale (VAS) presented on their digital screen (on either their computer or smartphone as a 400-pixel width scale). This differed from the bidimensional arousal/repulsion Likert scale used in the Paraphilia Scale (Dawson et al., 2016). The VAS was used as it is sensitive to subjective and continuous measurement, as is the case with sexual attraction (Vautier, 2011). The VAS was presented with two anchors: “Not sexually attracted” (coded as 0) and “Extremely sexually attracted” (coded as 100). The numerical value of ratings along the scale was hidden from participants but recorded for quantitative analyses. A small number of anchors were used so that participants were more likely to understand what each anchor meant and to reduce errors made when participants misunderstood differences between labels such as “somewhat” and “a lot” (Fok & Henry, 2015). Participants first rated their sexual attractions to the gender subgroup of items (as these may be most familiar to their concept of rating sexual attractions), followed by the age subgroup, and then the paraphilia subgroup. Finally, the items were presented in randomized orders within each subgroup for each participant. Figure 3.1 demonstrates how the measure was presented to participants.

The SAI was presented to a small group of participants before administration to the present study's sample. A group of five researchers in human sexuality (four of whom are doctoral students in clinical psychology, and one was a professor in clinical psychology) pilot-tested the SAI. Small adjustments were made to the font size, digital presentation, and page order. Following this, the SAI was given to a second group of five people within the lead author's personal network. No concerns or adjustments were noted at this phase.

### ***Kinsey Scale of Sexual Attraction***

To establish convergent validity with items from the SAI pertaining to gender-based attractions, a modified Kinsey scale (Kinsey et al., 1948, 1953) was presented to participants. Modifications were made in line with a recent publication by O'Kane et al. (2022) that used the wording "Please think about the people you have typically been sexually attracted to." For the present study, this prompt was reworded to increase the likelihood that participants understood they were rating sexual attractions specifically and not choosing an orientation label (i.e., "Typically, my sexual attractions can be understood as..."). Participants were presented with a 7-point scale that ranged from 0 (exclusively heterosexual) to 3 (equally heterosexual and homosexual) to 6 (exclusively homosexual) as is done with the Kinsey scale. Participants could also select "X" for those who report no gender-based sexual attraction. Limited research has been conducted on the psychometric properties of the scale, but Schrimshaw and colleagues (2006) reported the scale to have a test-retest reliability intra-class correlation (over two weeks) of .85 in a sample of older teenagers and young adults (i.e., comparable to our own sample). Although the Kinsey scale is not without its critiques (e.g., see Zietsch & Sidari, 2020), it is frequently used to assess sexual attraction.

### ***Social Desirability***

The Marlowe-Crowne Social Desirability Scale – Short Form (MCSD-SF; 13-item version) was administered to establish the degree to which participants responded in socially desirable ways (Crowne & Marlowe, 1960). The MCSD-SF is a widely used and validated 13-item true/false measure (e.g., Rasmussen et al., 2018). It has demonstrated convergent validity with the Edwards Social Desirability Scale (Reynolds, 1982) and the total Marlowe-Crowne scale (e.g., correlations above .80; Reynolds, 1982). However, the measure's internal consistency varies among undergraduate students (e.g.,  $\alpha = .60$ ; Rasmussen et al., 2018;  $\alpha = .76$ ; Reynolds, 1982) and community samples (e.g., law enforcement;  $\alpha = .74$ ; Greenberg & Weiss, 2012; public;  $\alpha = .44$ ; Tan et al., 2022). In the present study, the internal consistency (Cronbach's alpha) of the MCSD-SF was .66. The MCSD-SF is scored by assigning 1 to items marked as "True" and 0 to items marked as "False." Some items are reverse scored (e.g., 5, 7, 9, 10, 13). Higher summed scores indicate greater social desirability response tendencies.

### ***Survey Experience***

Participants were asked to respond to three open-ended questions. The questions prompted participants to reflect on their experience taking the survey and share their thoughts related to how effective (i.e., "In your opinion, how effective was the survey in assessing sexual attractions?"), acceptable (i.e., "In your opinion, was this survey an acceptable way of asking about sexual attractions?"), and understandable (i.e., "In your opinion, how easy to understand were the items?") the SAI was. Responses were coded by the lead author for agreement/disagreement using a five-category coding system (e.g., did participants agree or disagree that the survey was effective/acceptable/understandable). Coding options included agreement, strong agreement (defined as agreement with a positive connotation pre-modifier [e.g., "very," "extremely," "strongly"]), mixed opinions/unsure, disagreement, and strong

disagreement (defined as a disagreement with a negative connotation pre-modifier [e.g., “awfully,” “very,” “extremely”]).

### **Procedure**

Undergraduate students ( $n = 653$ ) were recruited through the university’s Integrated System for Participation in Research (ISPR) database. Graduate students ( $n = 17$ ) were recruited at baseline through email using non-academic opt-in/out listservs (e.g., the Graduate Association for Students in Psychology). The sample size was determined using G\*Power (Faul et al., 2007) using two studies that reported mean differences in sexual attractions over approximately six months, which were used to calculate an estimated effect size of .21 with an alpha of .05 and power of .95 (Diamond, 2000; Manley et al., 2015). The sample size calculation was made using this effect size, alpha, and power within a repeated-measures design with three time points over 6 months and multiplied by an estimated attrition factor of 60% throughout the study. This resulted in an estimated 500 participants needed to detect mean differences like those reported by Diamond (2000) and Manley et al. (2015). Oversampling was done to account for increased attrition rates related to COVID-19 (Yu et al., 2022),

Participants were informed of the longitudinal nature of the study and indicated, alongside their informed consent, their interest in receiving follow-up notifications. Participants provided their contact information separately from their stored data on the SoSci platform. Following this, participants confirmed their email address and received the link to their first survey. Each survey was approximately 15 minutes long and was given thrice (i.e., at baseline, 2 weeks later, and 6 months later). Undergraduate participants were given a 0.5 partial course credit for completing the first survey and an additional 0.5 partial course credit for participating at Time 2 (2 weeks later). If they once again completed the survey at Time 3 (6 months later),

they were entered into a draw to win one of five \$100 Amazon gift cards. Graduate students were automatically entered into the gift card draw if they participated in the study.

### **Data Analysis Plan**

The first objective of this study was to describe the sexual attractions of the sample. Accordingly, mean scores are reported for the total sample and gender groups. Pearson correlations were used to evaluate social desirability in responding to the SAI. After reporting demographic and descriptive statistics, the second objective of the present study was to evaluate the convergent validity of the SAI. Positive Pearson correlations among analogous items (i.e., gender-based attractions) in the SAI and the Kinsey scale were therefore evaluated as a metric of convergent validity.

Thirdly, the test-retest reliability of the SAI over a 2-week interval was assessed. It was hypothesized that changes in sexual attractions would be unlikely, as has been demonstrated by others using this timeframe with similar procedures (e.g., Welsch et al., 2021). Therefore, intraclass correlations (ICC) with two-way mixed effects and absolute agreement were used to evaluate the test-retest reliability of the SAI between baseline and the second assessment two weeks later. ICC values below .70 were considered weak or unacceptable evidence of test-retest reliability, and those above .70 were acceptable evidence (Matheson, 2019; Nunnally, 1978).

Fourthly, the degree of change over six months for each item was evaluated with a modified Cohen's  $d$  formula that uses the absolute within-individual change from Time 1 to Time 3 as the numerator and the pooled standard deviation as the denominator. This metric was labeled "Walters's standardized index of change" ( $d_{wsc}$ ) and can be used to calculate an effect size of directionless (i.e., absolute) change in sexual attraction scores within participants over

time<sup>1</sup>. Because absolute values were used in calculating  $d_{wsc}$ , traditional confidence interval methods would not be appropriate. Therefore, a 95% confidence interval was calculated for each change index using 5,000 bootstrap samples. Changes were also assessed at the individual level using a reliable change index (RCI) and the formula from Ley (1972), which used the generic variance of each item at baseline and the test-retest consistency from the two-week assessment (as per Guhn et al., 2014). Factor scores derived from the exploratory factor analysis (see below) were compared across time using the same methods described.

Fifthly, the factor structure of the SAI was assessed. The SAI was developed to be an inventory of diverse sexual stimuli. Therefore, an EFA was planned to identify potential latent variables or clusters of attractions. The goal was not to reduce the measure but to analyze its multidimensional nature and provide evidence that the measure functions in ways comparable to what others have reported in factor structures of measures of sexual attraction and interests (e.g., Molen et al., 2023; Schippers et al., 2021; Schippers et al., 2023). However, as reported below, eight items on the SAI were unreliable over two weeks, leaving 32 items for the exploratory factor analysis.

To prepare data for an EFA, sexual attraction scores at Time 1 were standardized, and univariate outliers were winsorized (resulting in 1.7% of the data being winsorized). Multivariate normality was assessed through Mahalanobis distances, and 10 outliers were removed. This left 660 participants for factor analyses. As multivariate outliers were removed and all 32 sexual attractions originally included in the EFA were within acceptable limits of skew and kurtosis

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<sup>1</sup> This formula was developed in consultation with Dr. Dennis Cousineau. I acknowledge and thank Dr. Cousineau for his thoughtful and instructive support in developing the code to run my formula in R.

(i.e., 2 and 7, respectively; Ryu, 2011), a maximum likelihood extraction method with an oblique rotation (i.e., Promax) was used (Osborne et al., 2008; Sakaluk & Short, 2016). Other assumptions for EFA were evaluated by assessing the Kaiser-Meyer-Olkin measure of sampling adequacy ( $KMO = .79$ ) and Bartlett's test of sphericity ( $p < .001$ ). Multicollinearity was assessed using the determinant of the correlation matrix (determinant = .00005). The number of factors to retain was assessed by triangulating the results of a parallel analysis, scree plot, and eigenvalues. Items with communalities below .20 were then removed stepwise. This step resulted in 15 items being removed from the factor analysis and 17 retained. Finally, summed item factor scores were generated across each time point to compare test-retest reliability and change over six months (DiStefano et al., 2019).

Lastly, the participants were asked to rate the measure's effectiveness, acceptability, and understandability. As discussed, responses were coded and grouped into qualitative descriptors (e.g., agreement, disagreement). These results are reported to contextualize the participants' experience taking the SAI and evaluate the measure's face validity.

## **Results**

### **Descriptive Statistics of Sexual Attractions**

Participants in this sample, on average, were most sexually attracted to young adults, people who present as men, having sex with an adult man, and being controlled or dominated, at all three time points. At baseline, men reported the greatest mean sexual attraction scores for young adults, people who present as women, having sex with an adult woman, and controlling or dominating someone. Women reported the greatest mean sexual attraction scores for people who present as men, young adults, having sex with an adult man, and being controlled or dominated. Non-binary+ (“+” indicating that several identities were combined into this category; see Table

3.1) participants reported the greatest mean sexual attraction scores for young adults, people who present as a gender outside the binary of men/women, people who present as women, and being controlled or dominated by someone.

Participants were, on average, least sexually attracted to babies, toddlers, children, and having sex with animals; men, however, reported lower attraction for being defecated on than for having sex with animals. Descriptive statistics of each item in the SAI across time points are listed in Table 3.2, and gender differences at baseline are highlighted in Table 3.3.

### **Social Desirability**

Social desirability scores were weakly correlated to sexual attraction items, Pearson's  $r = -.18$ , 95% CI [-.25, -.11] (sexual attraction to adults) to  $.03$ , 95% CI [-.05, .10] (sexual attraction to babies). Similarly, social desirability scores were weakly correlated to the factor scores derived from an EFA, Pearson's  $r = -.18$  (Factor 1 – men and submissiveness) to  $-.05$  (Factor 2 – women and non-binary genders). These correlations are presented in Table 3.4.

### **Convergent Validity**

Among the men who completed the Time 1 survey ( $n = 128$ ), there was a positive correlation between their ratings of attraction to people who present as men and their rating on the Kinsey scale (where higher scores indicate more same-sex attraction),  $r(126) = .81$ , 95% CI [.74, .86] and between attraction to having sex with adult men and the Kinsey scale,  $r(126) = .78$ , 95% CI [.70, .84]. There was a negative correlation between their ratings of attraction to people who present as women and the Kinsey scale,  $r(126) = -.66$ , 95% CI [-.75, -.55] and between attraction to having sex with adult women and the Kinsey scale,  $r(126) = -.51$ , 95% CI [-.63, -.37].

A comparable pattern of results was observed in women ( $n = 529$ ). There was a negative correlation between their ratings of attraction to people who present as men and the Kinsey scale,  $r(527) = -.42$ , 95% CI  $[-.49, -.34]$ . There was no association between attraction to having sex with adult men and the Kinsey scale,  $r(527) = -.02$ , 95% CI  $[-.10, .07]$ . There was a positive correlation between their ratings of attraction to people who present as women and the Kinsey scale,  $r(527) = .68$ , 95% CI  $[.63, .72]$ , and between attraction to having sex with adult women and the Kinsey scale,  $r(527) = .60$ , 95% CI  $[.54, .65]$ .

There were 13 self-identified non-binary+ participants in our sample. Among these participants, there was a negative correlation between attraction to people who present as men and the Kinsey scale,  $r(11) = -.90$ , 95% CI  $[-.98, -.54]$ . The correlation between attraction to having sex with adult men and the Kinsey scale was comparable to what was reported by men, but with wide confidence intervals that included zero,  $r(11) = -.60$ , 95% CI  $[-.90, .14]$ . The correlations between sexual attraction to people who present as women and the Kinsey scale,  $r(11) = -.17$ , 95% CI  $[-.74, .57]$ , between attraction to having sex with adult women and the Kinsey scale,  $r(11) = -.25$ , 95% CI  $[-.78, .56]$ , and between attraction to people who present as a gender outside the binary of men/women and the Kinsey scale,  $r(11) = -.56$ , 95% CI  $[-.89, .20]$  were all negative and had wide confidence intervals that included zero.

### **Test-Retest Reliability**

Test-retest reliability was evaluated via intraclass correlations (ICC) of all 40 items in the SAI between Time 1 and Time 2 (two weeks apart;  $n = 332$ ). Evidence of acceptable test-retest reliability (i.e., ICC values  $> .70$ ) was observed among 32 of the 40 items in the SAI (see Table 3.5). Eight items demonstrated weak test-retest reliability: sexual attraction to children; toddlers; babies; touching an object like shoes, gloves, or plush toys; having sex with an animal;

defecating on someone; touching or rubbing a stranger who is not expecting it; and forcing someone into sexual activity. To test whether there was a preferentiality effect (e.g., the more attracted people are to a stimulus, the more stable the attraction is over 2 weeks), the mean sexual attraction scores at baseline for each item on the SAI were plotted against the ICC of those items (see Figure 3.2). Generally, lower-rated items demonstrated weaker test-retest reliability 2 weeks later. All eight of the unreliable items had mean scores below 10/100.

### **Changes in Sexual Attractions**

Changes in sexual attractions were assessed using  $d_{wsc}$  and RCIs, the latter to identify how many participants experienced change with time across each item. Among the 144 participants who completed the Time 1 and 3 assessments, the greatest absolute change was observed among the items “controlling or dominating someone” ( $d_{wsc} = .78$ ) and “tying or handcuffing someone” ( $d_{wsc} = .63$ ), which both had effect sizes with 95% bootstrapped confidence intervals that did not include zero (see Table 3.7). The least absolute change was observed among the items “cutting someone's skin” ( $d_{wsc} = .22$ ) and “having your skin cut” ( $d_{wsc} = .23$ ), which both had effect sizes with 95% bootstrapped confidence intervals that did not include zero.

Using the RCI and the 105 participants who completed all three assessments, the items that had the most participants who experienced reliable change were “people who present as men” ( $n = 28, 27\%$ ) and “controlling or dominating someone” ( $n = 28, 27\%$ ). The item with the fewest participants who experienced reliable change was “pretending to rape someone” ( $n = 5, 5\%$ ). When calculating the average units of change for these 105 participants across time, greater change was observed at the six-month follow-up than at the two-week follow-up for all items.

### **Exploratory Factor Analysis**

The EFA resulted in a five-factor model that explained 64% of the variance and included 17 of the 40 total items in the SAI. Table 3.6 lists the communalities and factor loadings of the pattern matrix. The first factor explained 11.9% of the variance (eigenvalue = 5.02). It included sexual attraction to people who present as men, having sex with an adult man, being controlled or dominated by someone, being tied or handcuffed, being spanked, beaten, or whipped by someone, being verbally humiliated by someone, and having breathing restricted during sexual activity. This factor was labeled “attraction to men and submissiveness.”

The second factor explained 16.3% of the variance (eigenvalue = 3.28). It included sexual attraction to people who present as women, having sex with an adult woman, and people who present as a gender outside the binary of men/women. This factor was labeled “attraction to women and non-binary genders”. The third factor explained 23.2% of the variance (eigenvalue = 1.69). It included sexual attraction to controlling or dominating someone, tying or handcuffing someone, and spanking, beating, or whipping someone. The third factor was labeled “attraction to dominance.”

The fourth factor explained 6.4% of the variance (eigenvalue = 1.33). It included sexual attraction to urinating on someone and being urinated on by someone. This factor was labeled “attraction to urine play.” The fifth and final factor explained 6.1% of the variance (eigenvalue = 1.15) and included sexual attraction to dressing up as someone of another gender and pretending to be someone of another gender. This factor was labeled “attraction to gender play.”

The two factors with the greatest correlation were attraction to women and non-binary genders (Factor 2) and attraction to dominance (Factor 3;  $r = .43$ ), followed by the correlation between attraction to urine play (Factor 4) and attraction to gender play (Factor 5;  $r = .34$ ). The

lowest factor correlation was between attraction to men and submissiveness (Factor 1) and attraction to women and non-binary genders (Factor 2;  $r = -.07$ ).

Factor scores were created and evaluated for test-retest reliability (i.e., between Time 1 and Time 2, as shown in Table 3.5) and change (i.e., between Time 1 and Time 3, as shown in Table 3.7). All five factors demonstrated acceptable test-retest reliabilities with ICC values and 95% confidence intervals above .70. Regarding change, reliable change was noted among the 105 completer participants across all five factors, but to varying degrees (see Table 3.7).

### **Participant Experience**

There were 625 comments at Time 1 regarding the effectiveness of the SAI. Participants generally indicated agreement (60%) or strong agreement (22%) that the SAI was effective in measuring sexual attractions. Conversely, 8% indicated disagreement, 1% strongly disagreed, and 9% were unsure or provided a mixed response. A total of 616 comments at Time 1 were received from participants responding to a question about the acceptability of the SAI. Most participants agreed (83%) that the SAI was an acceptable method of asking about sexual attractions while 4% of participants strongly agreed. Alternatively, 7% of participants disagreed, .6% strongly disagreed, and 4% were unsure or gave mixed responses. Lastly, participants were asked how understandable or clear the SAI was. Of the 627 comments received at Time 1, most participants either agreed (48%) or strongly agreed (50%) that the SAI was understandable or clear for them. Some participants disagreed (1%) or were unsure (1%). None of the participants strongly disagreed that the SAI was understandable or clear.

### **Discussion**

The primary aim of this study was to evaluate a novel measure of sexual attraction to diverse stimuli. This study extends previous work on measuring sexual attractions by integrating

research on sexual fluidity (e.g., Diamond, 2016) and paraphilic sexual attractions (e.g., Seto, 2017). The SAI assessed and quantified participants' ratings of sexual attractions to diverse stimuli over time. Participants' ratings of social desirability were weakly correlated with items on the SAI and derived factor scores (divergent validity). The SAI was correlated to the Kinsey scale when measuring gender-based attractions (convergent validity). It had acceptable test-retest reliability across most items. However, the eight unreliable items were all those that participants, on average, reported little to no sexual attraction toward. Across 6 months, the SAI detected absolute within-participant differences and reliable change (i.e., identifying participants whose scores differed reliably between Time 1 and 3 across each item). When exploring the factor structure, the SAI was composed of a potential interaction between gender-based attractions and themes of dominance and submissiveness. Two additional factors captured a specific attraction to urine play and gender play-related acts. Participants generally rated the SAI as highly effective, acceptable, and understandable.

### **Describing Participants' Sexual Attractions**

Participants in this study were most sexually attracted to genders, having sex with a specific gender, young adults, and several dominating and submissive acts. Given the prevalence of other-gender and teleiophilic attraction in the public (e.g., Money, 1986; Rahman et al., 2020; Savin-Williams et al., 2012; Seto, 2017), it was unsurprising to find this (mostly heterosexual, young adult) student sample being most sexually attracted to genders other than their own, having sex with a specific gender, and young adults. The other items they were most attracted to were somewhat surprising, as researchers often report voyeurism and fetishism as the most common paraphilic attractions. For example, Joyal and Carpentier (2017) reported that both men and women in their Canadian sample ( $n = 1,040$ ) were most sexually interested in voyeurism and

fetishism and least interested in sex with children. Ahlers et al. (2011) reported that among 1,915 German participants, voyeuristic and fetishistic sexual fantasies were among the most common paraphilic sexual fantasies. The results of the present study are more like those of Dawson and colleagues' (2016) study of another Canadian student sample, where they reported voyeurism, fetishism, sadism, and masochism as the paraphilias participants were most sexually aroused by.

While the voyeurism item in the SAI was worded similarly to Joyal and Carpentier (2017), fetishism was assessed differently, which may explain the lower endorsement of fetishistic sexual attractions in the present study's sample. The SAI was written so that participants rated their sexual attractions to specific stimuli. While fetishism covers a potentially endless number of stimuli, the SAI assessed some of the most common fetish objects in this study (e.g., feet; Scorolli et al., 2007). When completing a survey like that of Joyal and Carpentier's, participants may imagine nearly any physical object they may be attracted to. In the present study, participants were given concrete examples that were limiting and, therefore, may not capture the breadth of fetishism.

### **Convergent Validity**

The SAI demonstrated convergent validity when comparing gender-based items alongside the Kinsey scale. There was an association between how men and women both rated their sexual attractions to other men and women on the SAI and the Kinsey scale. Non-binary+ participants rated their sexual attraction to men in ways that were associated with an other-sex attraction score on the Kinsey scale. The strength of the association varied but was higher when participants rated their attraction to a person's gender compared to their attraction to having sex with a specific gender. Interestingly, women's ratings of their sexual attraction to having sex with adult men on the SAI were not associated with their Kinsey scale score. This speaks to a

general observation that may be more characteristic of women than other genders; participants in this sample were more attracted to the gendered concept of someone (e.g., “a man”) than the specific act of having sex with that same someone.

The difference between being attracted to a specific gender (e.g., “men”) and being attracted to having sex with that gender (e.g., “sex with men”) could be explained through several hypotheses. Most parsimoniously, the wording of the stimuli may explain the difference whereby a shorter stimulus cue, “men,” is easier to appraise than a more complex one, such as “sex with adult men.” When participants evaluated their sexual attraction to “sex with an adult man,” they were likely making three related appraisals: “sex,” “adult,” and “man.” However, these appraisals may conflict and produce a rating of sexual attraction that differs from just evaluating an attraction to men.

Alternatively, but relatedly, sexual attraction to having sex with a specific gender (e.g., “having sex with an adult man”) requires a person to consider more complex interpersonal dynamics than sexual attraction to that gender (e.g., “people who present as men”). Wilson (1987) has argued that sexual behavior is conceptualized differently than measures of sexual inclination (i.e., sexual attraction, desire, fantasy), as behavior represents more than just the individual’s attraction but also includes the requirements of others (pp. 123). Perhaps attraction to having sex with someone might overlap with a person’s ability to carry out this attraction (e.g., a bisexual man in a monogamous relationship with a man contending with his attraction to women as it might require infidelity) or intersect with negative beliefs or values about sex with the same gender (e.g., where, in some religious communities, same-sex attraction is categorically different from same-sex behavior; Lefevor et al., 2020). Overall, the finding that participants generally were more sexually attracted to a gender than to having sex with that gender may

generate novel hypotheses for researchers interested in the overlap (and differences) between sexual attraction, behavior, and orientation.

### **Test-Retest Reliability**

It was assumed that participants' sexual attractions in the present study would not change (much) over two weeks as previous research has reported that, over short periods of 2 to 3 weeks, sexual interests tend to demonstrate stability (e.g., Welsch et al., 2020) as does sexual orientation (e.g., Sagayaraj & Gopal, 2020; Schrimshaw et al., 2006). Thus, it was expected that most items would demonstrate reliability over this time. Across two weeks, participants in the present study provided reliably similar responses on 32 of the 40 items on the SAI and all five factor scores.

The eight items that did not demonstrate acceptable test-retest reliability (i.e., sexual attraction to children; toddlers; babies; touching an object like shoes, gloves, or plush toys; having sex with an animal; defecating on someone; touching or rubbing a stranger who is not expecting it; and forcing someone into sexual activity) were among the items rated lowest by participants on the SAI (all of which had mean sexual attraction scores below 10/100). This finding is comparable to what Welsch et al. (2020) reported when studying test-retest reliabilities of sexual interest in children and adults. In samples comparing men with sexual offenses against children and those without, Welsch et al. reported that the first group had more reliable test-retest scores than the other men (recruited from a university and the online public) on a measure of pedohebephilic sexual interests. This was, as discussed, likely because the pedohebephilic sexual interest scores (and corresponding effect sizes) among the non-offending group were so low that it was difficult to detect reliable changes. Therefore, they proposed that a cutoff of medium to large effect sizes should be used to classify "true" change more accurately.

In the present study, when the average scores for each item at baseline were plotted against the ICCs, a clear pattern was observed: Lower-rated items had lower ICCs. Figure 3.2 shows that stimuli with very low mean sexual attraction scores (i.e.,  $< 5/100$ ) demonstrated volatility over two weeks. When mean sexual attraction scores surpassed 10/100, the participant ratings demonstrated a relatively reliable ICC over two weeks. Our interpretation of this finding is that, without test-retest reliability data, researchers ought not to draw meaningful conclusions or trust the reliability (and thus the validity) of sexual attractions with ratings less than 10/100. While most attractions with low ratings (17/25) still had acceptable reliability (e.g., being defecated on by someone), all eight unreliable items had mean scores lower than 10/100. This finding may be of interest to future researchers attempting to map the development of sexual attractions across time. Researchers interested in atypical sexual attractions (e.g., urophilia) may instead use a more purposeful sampling of groups (e.g., people who are part of urophilic play groups or online communities) who are more likely to rate their sexual attractions above the 10/100 cutoff.

### **Changes in Sexual Attractions**

The third research aim of the present study was to evaluate changes in sexual attractions using data from the 6-month follow-up. Little research has been conducted on “true” change in sexual attractions, and thus, we evaluated two methods of change: absolute standardized within-participant change and reliable change indices (RCIs). A modified Cohen’s  $d$  formula was used to account for changes in sexual attraction regardless of the direction of change. As shown in Table 3.7, participants generally demonstrated some degree of change across all 32 of the reliable SAI items and across factor scores. All these effect sizes had bootstrapped confidence intervals above zero.

We also calculated the difference in scores for each participant across each item to report an RCI. Given that we are relatively unsure about the nature of change in sexual attractions, two possibilities were considered when preparing this analysis: (1) there may exist distinct groups of people, some of whom change (“changers”) and some of whom do not (“non-changers”), and (2) everyone may change to some degree at any time, meaning that change happens along a continuum. To account for both possibilities, the RCI was used to calculate reliable change because it considered the measurement error of the SAI and treated each case as a distinct observation. This allowed us to identify the number of participants who experienced reliable change (i.e., “changers”) on the SAI (a novel measure which likely has a degree of measurement error) within the continuum of change experienced. We recommend this approach be replicated by researchers interested in capturing changes in sexual attractions.

Across both methods of evaluating change, sexual attraction to domination and related acts (e.g., “controlling or dominating someone,” “spanking, beating, or whipping someone,” “tying or handcuffing someone”) and submissiveness and related acts (e.g., “being controlled or dominated by someone,” “being spanked, beaten, or whipped by someone,” “being tied or handcuffed”) changed the most over time. Indeed, other researchers have discussed the changes in other sexuality-related variables (i.e., identity and behavior) among those engaged in practices like BDSM (bondage, discipline, dominance, submission, and sadomasochism; Brown et al., 2020). Perhaps these types of sexual attractions are also susceptible to change.

Some researchers have hypothesized that as societies destigmatize sadism and masochism (i.e., through popular books such as *Fifty Shades of Grey*), there has been an increase in societal attraction to and experience with these acts (e.g., Holvoet et al., 2017). Holvoet et al. discussed their finding that older participants (i.e., aged 48 – 65 years) were less interested in submissive or

dominance acts than younger participants despite having more life experience to explore their interests (pp. 1157-1158). One explanation for our findings is that participants in our sample were generally young adults who may represent a cohort of people more open and interested in exploring BDSM activities and experiencing less stigma associated with these acts. Exploring BDSM activities could produce varied degrees of change as some people discover pleasure and enjoyment (i.e., potentially increasing attraction) while others discover discomfort or disinterest (i.e., potentially decreasing attraction). This may explain the greater absolute changes observed among items related to dominance and submissiveness. Future researchers should offer qualitative interviews to participants who report sexual attraction to dominance/submissiveness to contextualize any observed changes over time.

### **Exploratory Factor Analysis**

An exploratory factor analysis of 17 items from the SAI demonstrated five factors that represented gender-based sexual attractions, dominance and submissiveness, attraction to urine play, and attraction to gender play. Broadly, the results of the exploratory factor analysis align with several hypotheses of multidimensionality within sexual attractions (and orientation; Beier et al., 2005; Seto, 2017; van Anders, 2015) and can be compared to a recently published factor analysis of the Paraphilia Scale by Seto et al. (2025)

Seto et al. (2025) used confirmatory factor analysis testing in a three-part study design to evaluate configural, scalar, and metric invariance across gender and sexual orientation. The result of their first study was that of a hierarchical four-factor model that included a similar cluster of items to that of the present study (i.e., Factor 2): an agonistic continuum of items related to sadism and masochism. However, in the present study, items related to masochism and sadism loaded onto separate factors and overlapped with gender-based attractions (i.e., Factor 1).

This difference could be attributed to which items from the Paraphilia Scale (or the adapted version of these items used in the SAI) were included in analyses. Although Seto et al. use a community/student sample like ours, we excluded many items that were either unreliable or had low communalities. This certainly contributed to differences in results as items included in the agonism continuum (e.g., those related to biastophilia) were not considered in the present study's EFA.

Additionally, we did not explore comparisons across genders, given the small number of men that remained after the third assessment. Seto et al. (2025) found evidence of configural invariance for gender (i.e., the factor structure of the Paraphilia Scale was consistent for men and women); however, they did not find evidence of metric invariance. This suggests that the items may load differently for men and women but along a similar factor structure. It would be interesting to replicate our findings and those of Seto et al. by suppressing unreliable items and splitting the sample by gender. This analysis might help explain the pattern observed in the present study where gender-based items overlapped with BDSM-related ones, like in Factor 1.

One alternative and exploratory explanation for gender-based attractions loading with submissive/masochistic attractions is that the meaning of being sexually attracted to a “man” or “woman” is dependent on the society or culture making the rating and their conceptualization of power. Participants in the present study may have drawn sociocultural connections between gender and the power play that characterizes masochism and sadism (e.g., Bryan et al., 2011; Simula & Sumerau, 2019). The potential relationship between gender ideology and masochism/sadism is likely not linear, as some have noted that these sexual acts provide an opportunity to subvert traditional gender roles (e.g., Simula, 2019). Future researchers could expand upon the findings of the present study by replicating this factor structure and conducting

qualitative interviews with participants to better understand potential associations between gender ideology and sexual attractions related to masochism and sadism. Further research is needed, particularly longitudinal research, to understand and develop a functional taxonomy of sexual attractions that captures dimensionality, interdependence, common factors, and fluidity with time.

### **Limitations**

The present study should be interpreted within the context of its limitations. First, the generalizability of these findings is likely limited by sample or volunteer biases. This sample of students certainly does not represent the public. People with greater sexual experience and more open sexual attitudes may be more likely to participate in sexuality research (Dawson et al., 2019). Second, this study focused on absolute change, which may obfuscate differences between those experiencing an increase and a decrease in sexual attractions. There may be phenomenological differences between “increasers” and “decreasers” that were not explored in the present study. Finally, the present study's findings are limited by the selection of items included in the SAI. There is a potentially endless number of stimuli that people may be sexually attracted to. It would be interesting to conduct more qualitative interviews to hear from participants about what they are attracted to, generate novel SAI items, and evaluate them quantitatively (particularly over time).

### **Conclusion**

This study aimed to evaluate the Sexual Attraction Inventory (SAI), a new measure of sexual attraction to diverse stimuli (e.g., genders, ages, sexual acts) that might be sensitive to changes (fluidity) over time. The SAI demonstrated test-retest reliability, had a five-factor structure, and was generally rated positively by participants. To use the SAI, researchers can

replicate its structure (i.e., presenting participants with a guiding definition, replicating the wording of its prompts, and using a unidimensional 100-point sliding VAS without visible numbers to participants) as per Figure 3.1.

## References

- Ahlers, C. J., Schaefer, G. A., Mundt, I. A., Roll, S., Englert, H., Willich, S. N., & Beier, K. M. (2011). How unusual are the contents of paraphilias? Paraphilia-associated sexual arousal patterns in a community-based sample of men. *Journal of Sexual Medicine*, 8, 1362-1370. <https://doi.org/10.1111/j.1743-6109.2009.01597.x>
- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.). <https://doi.org/10.1176/appi.books.9780890425787>
- Austin, S. B., Conron, K., Patel, A., & Freedner, N. (2007). Making sense of sexual orientation measures: Findings from a cognitive processing study with adolescents on health survey questions. *Journal of LGBT Health Research*, 3, 55-65. [https://doi.org/10.1300/J463v03n01\\_07](https://doi.org/10.1300/J463v03n01_07)
- Babchishin, K. M., Nunes, K. L., & Hermann, C. A. (2013). The validity of Implicit Association Test (IAT) measures of sexual attraction to children: A meta-analysis. *Archives of Sexual Behaviour*, 42, 487-499. <https://doi.org/10.1007/s10508-012-0022-8>
- Bailey, J. M. (2009). What is sexual orientation and do women have one? In *Contemporary perspectives on lesbian, gay, and bisexual identities* (pp. 43-63). Springer, New York, NY. [https://doi.org/10.1007/978-0-387-09556-1\\_3](https://doi.org/10.1007/978-0-387-09556-1_3)
- Beier, K. M., Bosinski, H. A., & Loewit, K. (2005). *Sexualmedizin: Grundlagen und Praxis; mit 61 Tabellen und 50 Übersichten*. Elsevier, Urban & Fischer Verlag.
- Beischel, W. J., Schudson, Z. C., Hoskin, R. A., & van Anders, S. M. (2022). The gender/sex 3×3: Measuring and categorizing gender/sex beyond binaries. *Psychology of Sexual Orientation and Gender Diversity*, 10, 355-372. <https://doi.org/10.1037/sgd0000558>

- Brown, A., Barker, E. D., & Rahman, Q. (2020). A systematic scoping review of the prevalence, etiological, psychological, and interpersonal factors associated with BDSM. *Journal of Sex Research, 57*, 781-811. <https://doi.org/10.1080/00224499.2019.1665619>
- Bryan, A. D., Webster, G. D., & Mahaffey, A. L. (2011). The big, the rich, and the powerful: Physical, financial, and social dimensions of dominance in mating and attraction. *Personality and Social Psychology Bulletin, 37*, 365-382. <https://doi.org/10.1177/0146167210395604>
- Busseri, M. A., Willoughby, T., Chalmers, H., & Bogaert, A. F. (2008). On the association between sexual attraction and adolescent risk behavior involvement: Examining mediation and moderation. *Developmental Psychology, 44*, 69. <https://doi.org/10.1037/0012-1649.44.1.69>
- Cantor, J. M. (2012). Is homosexuality a paraphilia? The evidence for and against. *Archives of Sexual Behaviour, 41*, 237-247. <https://doi.org/10.1007/s10508-012-9900-3>
- Carvalho, J., Bradford, J., Murphy, L., Briken, P., & Fedoroff, P. (2020). Measuring pedophilic sexual interest. *Journal of Sexual Medicine, 17*, 378-392. <https://doi.org/10.1016/j.jsxm.2019.12.008>
- Chivers, M. L., Roy, C., Grimbos, T., Cantor, J. M., & Seto, M. C. (2014). Specificity of sexual arousal for sexual activities in men and women with conventional and masochistic sexual interests. *Archives of Sexual Behaviour, 43*, 931-940. <https://doi.org/10.1007/s10508-013-0174-1>
- Cohen, N., Becker, I., & Štulhofer, A. (2020). Stability versus fluidity of adolescent romantic and sexual attraction and the role of religiosity: A longitudinal assessment in two

- independent samples of Croatian adolescents. *Archives of Sexual Behaviour*, 49, 1477-1488. <https://doi.org/10.1007/s10508-020-01713-y>
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, 24, 349. <https://doi.org/10.1037/h0047358>
- Davis, K. E. (2001). The relationship rating form (RRF): A measure of characteristics of romantic relationships and friendships. In J. Touliatos, B. Perlmutter, & G. Holden (Eds.), *Handbook of family measurement techniques* (2nd ed., pp. 195-197). Sage Publications.
- Davis, K. E., & Todd, M. J. (1982). Friendship and love relationships. In K. E. Davis & T. O. Mitchell (Eds.), *Advances in Descriptive Psychology*, 2, 79-112. JAI Press.
- Dawson, S. J., Bannerman, B. A., & Lalumière, M. L. (2016). Paraphilic interests: An examination of sex differences in a nonclinical sample. *Sexual Abuse*, 28, 20-45. <https://doi.org/10.1177/1079063214525645>
- Dawson, S. J., & Chivers, M. L. (2019). The effect of task demands on gender-specificity of visual attention biases in androphilic women and gynephilic men. *Personality and Individual Differences*, 146, 120-126. <https://doi.org/10.1016/j.paid.2019.04.006>
- Dawson, S. J., Huberman, J. S., Bouchard, K. N., McInnis, M. K., Pukall, C. F., & Chivers, M. L. (2019). Effects of individual difference variables, gender, and exclusivity of sexual attraction on volunteer bias in sexuality research. *Archives of Sexual Behaviour*, 48, 2403-2417. <https://doi.org/10.1007/s10508-019-1451-4>

- Diamond, L. M. (2000). Sexual identity, attractions, and behavior among young sexual-minority women over a 2-year period. *Developmental Psychology, 36*, 241.  
<https://doi.org/10.1037/0012-1649.36.2.241>
- Diamond, L. M. (2008). *Sexual fluidity: Understanding women's love and desire*. Harvard University Press.
- Diamond, L. M. (2016). Sexual fluidity in male and females. *Current Sexual Health Reports, 8*, 249-256. <https://doi.org/10.1007/s11930-016-0092-z>
- Diamond, L. M., Alley, J., Dickenson, J., & Blair, K. L. (2020). Who counts as sexually fluid? Comparing four different types of sexual fluidity in women. *Archives of Sexual Behaviour, 49*, 2389-2403. <https://doi.org/10.1007/s10508-019-01565-1>
- Diamond, L. M., Dickenson, J. A., & Blair, K. L. (2017). Stability of sexual attractions across different timescales: The roles of bisexuality and gender. *Archives of Sexual Behaviour, 46*, 193-204. <https://doi.org/10.1007/s10508-016-0860-x>
- DiStefano, C., Zhu, M., & Mindrila, D. (2019). Understanding and using factor scores: Considerations for the applied researcher. *Practical Assessment, Research, and Evaluation, 14*, 20. <https://doi.org/10.7275/da8t-4g52>
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G\* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175-191. <https://doi.org/10.3758/BF03193146>
- Fernández, J., Quiroga, M. A., & Rodríguez, A. (2006). Dimensionalidad de la atracción sexual [Sexual attraction: Its dimensionality]. *Psicothema, 18*, 392-399.

- Field, J. E., Crothers, L. M., & Kolbert, J. B. (2007). Adolescent female gender identity and attraction to male bullies and victims. *Journal of Emotional Abuse, 7*, 1-15.  
[https://doi.org/10.1300/J135v07n01\\_01](https://doi.org/10.1300/J135v07n01_01)
- Fok, C. C. T., & Henry, D. (2015). Increasing the sensitivity of measures to change. *Prevention Science, 16*, 978-986. <https://doi.org/10.1007/s11121-015-0545-z>
- Friedman, M. S., Silvestre, A. J., Gold, M. A., Markovic, N., Savin-Williams, R. C., Huggins, J., & Sell, R. L. (2004). Adolescents define sexual orientation and suggest ways to measure it. *Journal of Adolescence, 27*, 303-317.  
<https://doi.org/10.1016/j.adolescence.2004.03.006>
- Fu, T. C., Herbenick, D., Dodge, B., Owens, C., Sanders, S. A., Reece, M., & Fortenberry, J. D. (2019). Relationships among sexual identity, sexual attraction, and sexual behavior: Results from a nationally representative probability sample of adults in the United States. *Archives of Sexual Behaviour, 48*, 1483-1493. <https://doi.org/10.1007/s10508-018-1319-z>
- Gaither, G. A., Sellbom, M., & Meier, B. P. (2003). The effect of stimulus content on volunteering for sexual interest research among college students. *Journal of Sex Research, 40*, 240-248. <https://doi.org/10.1080/00224490309552188>
- Greenberg, B., & Weiss, P. (2012). Validation of a short form of the Marlowe-Crowne for use with law enforcement personnel. *Journal of Police and Criminal Psychology, 27*, 123-128. <https://doi.org/10.1007/s11896-012-9100-z>
- Guhn, M., Forer, B., & Zumbo, B. D. (2014). Reliable change index. *Encyclopedia of Quality of Life and Well-Being Research*, 5459-5462. [https://doi.org/10.1007/978-94-007-0753-5\\_2465](https://doi.org/10.1007/978-94-007-0753-5_2465)

- Holden, R. R., & Passey, J. (2009). Social desirability. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 441–454). The Guilford Press.
- Holvoet, L., Huys, W., Coppens, V., Seeuws, J., Goethals, K., & Morrens, M. (2017). Fifty shades of Belgian gray: The prevalence of BDSM-related fantasies and activities in the general population. *Journal of Sexual Medicine, 14*, 1152-1159.  
<https://doi.org/10.1016/j.jsxm.2017.07.003>
- Huberman, J. S., & Chivers, M. L. (2015). Examining gender specificity of sexual response with concurrent thermography and plethysmography. *Psychophysiology, 52*, 1382-1395.  
<https://doi.org/10.1111/psyp.12466>
- Igartua, K., Thombs, B. D., Burgos, G., & Montoro, R. (2009). Concordance and discrepancy in sexual identity, attraction, and behavior among adolescents. *Journal of Adolescent Health, 45*, 602-608. <https://doi.org/10.1016/j.jadohealth.2009.03.019>
- Israel, E., & Strassberg, D. S. (2009). Viewing time as an objective measure of sexual interest in heterosexual men and women. *Archives of Sexual Behaviour, 38*, 551-558.  
<https://doi.org/10.1007/s10508-007-9246-4>
- Johns, M. M., Zimmerman, M., & Bauermeister, J. A. (2013). Sexual attraction, sexual identity, and psychosocial wellbeing in a national sample of young women during emerging adulthood. *Journal of Youth and Adolescence, 42*, 82-95. <https://doi.org/10.1007/s10964-012-9795-2>
- Joyal, C. C., & Carpentier, J. (2017). The prevalence of paraphilic interests and behaviors in the general population: A provincial survey. *Journal of Sex Research, 54*, 161-171.  
<https://doi.org/10.1080/00224499.2016.1139034>

- Kaplan, D. L., & Keys, C. B. (1997). Sex and relationship variables as predictors of sexual attraction in cross-sex platonic friendships between young heterosexual adults. *Journal of Social and Personal Relationships, 14*, 191-206.  
<https://doi.org/10.1177/0265407597142003>
- Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. Philadelphia: W. B. Saunders.
- Klein, F., Sepekoff, B., & Wolf, T. J. (1985). Sexual orientation: A multi-variable dynamic process. *Journal of Homosexuality, 11*, 35-49. [https://doi.org/10.1300/J082v11n01\\_04](https://doi.org/10.1300/J082v11n01_04)
- Lefevor, G. T., Sorrell, S. A., Kappers, G., Plunk, A., Schow, R. L., Rosik, C. H., & Beckstead, A. L. (2020). Same-sex attracted, not LGBTQ: The associations of sexual identity labeling on religiousness, sexuality, and health among Mormons. *Journal of Homosexuality, 67*, 940-964. <https://doi.org/10.1080/00918369.2018.1564006>
- Legate, N., & Rogge, R. D. (2019). Identifying basic classes of sexual orientation with latent profile analysis: Developing the multivariate sexual orientation classification system. *Archives of Sexual Behaviour, 48*, 1403-1422. <https://doi.org/10.1007/s10508-018-1336-y>
- Ley, P. (1972). *Quantitative aspects of psychological assessment* (Vol. 1, p. 81). Duckworth.
- Manley, M. H., Diamond, L. M., & van Anders, S. M. (2015). Polyamory, monoamory, and sexual fluidity: A longitudinal study of identity and sexual trajectories. *Psychology of Sexual Orientation and Gender Diversity, 2*, 168. <https://doi.org/10.1037/sgd0000098>
- Martijn, F. M., Babchishin, K. M., Pullman, L. E., & Seto, M. C. (2020). Sexual attraction and falling in love in persons with pedohebephilia. *Archives of Sexual Behaviour, 49*, 1305-1318. <https://doi.org/10.1007/s10508-019-01579-9>

- Matheson, G. J. (2019). We need to talk about reliability: making better use of test-retest studies for study design and interpretation. *PeerJ*, 7, e6918. <https://doi.org/10.7717/peerj.6918>
- Meston, C. M., Heiman, J. R., Trapnell, P. D., & Paulhus, D. L. (1998). Socially desirable responding and sexuality self-reports. *Journal of Sex Research*, 35, 148-157. <https://doi.org/10.1080/00224499809551928>
- Molen, L. V., Ronis, S. T., & Benoit, A. A. (2023). Paraphilic interests versus behaviors: Factors that distinguish individuals who act on paraphilic interests from individuals who refrain. *Sexual Abuse*, 35, 403-427. <https://doi.org/10.1177/10790632221108949>
- Money, J. (1986). *Lovemaps: Clinical concepts of sexual/erotic health and pathology, paraphilia, and gender transposition of childhood, adolescence, and maturity*. Ardent Media.
- Nunnally (1978). *Psychometric theory, 2nd edition*. McGraw-Hill.
- O'Kane, K. M., Milani, S., Chivers, M. L., & Dawson, S. J. (2023). Gynephilic men's and androphilic women's visual attention patterns: The effects of gender and sexual activity cues. *Journal of Sex Research*, 60, 880-889. <https://doi.org/10.1080/00224499.2022.2033675>
- Osborne, J. W., Costello, A. B., & Kellow, J. T. (2008). Best practices in exploratory factor analysis. In J. W. Osborne (Ed.), *Best practices in quantitative methods* (pp. 205-213). Sage Publishing. <https://doi.org/10.4135/9781412995627.d8>
- Paulhus, D. L., & Vazire, S. (2007). The self-report method. In *Handbook of research methods in personality psychology* (Vol. 1, pp. 224-239).

- Powls, J., & Davies, J. (2012). A descriptive review of research relating to sadomasochism: Considerations for clinical practice. *Deviant Behavior, 33*, 223-234.  
<https://doi.org/10.1080/01639625.2011.573391>
- Prause, N., & Janssen, E. (2006). Blood flow: Vaginal photoplethysmography. In I. Goldstein, C. M. Meston, S. R. Davis, & A. M. Traish (Eds.), *Women's sexual function and dysfunction: Study, diagnosis and treatment* (pp. 1-15). CRC Press.  
<https://doi.org/10.1201/b14618-53>
- Quinsey, V. L., Ketsetzis, M., Earls, C., & Karamanoukian, A. (1996). Viewing time as a measure of sexual interest. *Ethology and Sociobiology, 17*, 341-354.  
[https://doi.org/10.1016/S0162-3095\(96\)00060-X](https://doi.org/10.1016/S0162-3095(96)00060-X)
- Rahman, Q., Xu, Y., Lippa, R. A., & Vasey, P. L. (2020). Prevalence of sexual orientation across 28 nations and its association with gender equality, economic development, and individualism. *Archives of Sexual Behaviour, 49*, 595-606.  
<https://doi.org/10.1007/s10508-019-01590-0>
- Rasmussen, K. R., Grubbs, J. B., Pargament, K. I., & Exline, J. J. (2018). Social desirability bias in pornography-related self-reports: The role of religion. *Journal of Sex Research, 55*, 381-394. <https://doi.org/10.1080/00224499.2017.1399196>
- Rees, G., & Garcia, J. R. (2017). An investigation into the solitary and interpersonal aspects of sexual object fetishism: A mixed-methods approach. *Psychology & Sexuality, 8*, 252-267.  
<https://doi.org/10.1080/19419899.2017.1383301>
- Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe-Crowne Social Desirability Scale. *Journal of Clinical Psychology, 38*, 119-125.  
[https://doi.org/10.1002/1097-4679\(198201\)38:1](https://doi.org/10.1002/1097-4679(198201)38:1)

- Ryu, E. (2011). Effects of skewness and kurtosis on normal-theory based maximum likelihood test statistic in multilevel structural equation modeling. *Behavior Research Methods*, *43*, 1066-1074. <https://doi.org/10.3758/s13428-011-0115-7>
- Sagayaraj, K., & Gopal, C. R. (2020). Development of sexual orientation scale. *Journal of Psychosexual Health*, *2*, 224-232. <https://doi.org/10.1177/2631831820939807>
- Sakaluk, J. K., & Short, S. D. (2017). A methodological review of exploratory factor analysis in sexuality research: Used practices, best practices, and data analysis resources. *Journal of Sex Research*, *54*, 1-9. <https://doi.org/10.1080/00224499.2015.1137538>
- Savin-Williams, R. C., Joyner, K., & Rieger, G. (2012). Prevalence and stability of self-reported sexual orientation identity during young adulthood. *Archives of Sexual Behaviour*, *41*, 103-110. <https://doi.org/10.1007/s10508-012-9913-y>
- Sawatsky, M. L., Suschinsky, K. D., Lavrinsek, S., Chivers, M. L., & Lalumière, M. L. (2021). Can the vaginal photoplethysmograph and its associated methodology be used to assess anal vasocongestion in women and men? *Archives of Sexual Behaviour*, *50*, 3865-3888. <https://doi.org/10.1007/s10508-021-02069-7>
- Schippers, E. E., Smid, W. J., Huckelba, A. L., Hoogsteder, L. M., Beekman, A. T., & Smit, J. H. (2021). Exploratory factor analysis of unusual sexual interests. *Journal of Sexual Medicine*, *18*, 1615-1631. <https://doi.org/10.1016/j.jsxm.2021.07.002>
- Schippers, E. E., Smid, W., Hoogsteder, L., & de Vogel, V. (2023). Factor analysis with unusual sexual interests: A replication study in a representative population sample. *Sexual Abuse*, *36*, 464-485. <https://doi.org/10.1177/10790632231200841>
- Schrimshaw, E. W., Rosario, M., Meyer-Bahlburg, H. F., & Scharf-Matlick, A. A. (2006). Test-retest reliability of self-reported sexual behavior, sexual orientation, and psychosexual

- milestones among gay, lesbian, and bisexual youths. *Archives of Sexual Behaviour*, 35, 220-229. <https://doi.org/10.1007/s10508-005-9006-2>
- Scorolli, C., Ghirlanda, S., Enquist, M., Zattoni, S., & Jannini, E. A. (2007). Relative prevalence of different fetishes. *International Journal of Impotence Research*, 19, 432-437. <https://doi.org/10.1038/sj.ijir.3901547>
- Seto, M. C. (2012). Is pedophilia a sexual orientation? *Archives of Sexual Behaviour*, 41, 231-236. <https://doi.org/10.1007/s10508-011-9882-6>
- Seto, M. C. (2017). The puzzle of male chronophilias. *Archives of Sexual Behaviour*, 46, 3-22. <https://doi.org/10.1007/s10508-016-0799-y>
- Seto, M. C., Lalumière, M. L., Harris, G. T., & Chivers, M. L. (2012). The sexual responses of sexual sadists. *Journal of Abnormal Psychology*, 121, 739-753. <https://doi.org/10.1037/a0028714>
- Seto, M. C., Leroux, E. J., Kane, L., Ashbaugh, A. R., Lalumière, M. L., Curry, S., Stephens, S., & Chivers, M. L. (2025). Does the paraphilia scale work for everyone? Confirmatory factor analysis and measurement invariance across gender and sexual orientation groups. *Journal of Sex Research*, 62, 411-420. <https://doi.org/10.1080/00224499.2024.2353303>
- Simula, B. L. (2019). Pleasure, power, and pain: A review of the literature on the experiences of BDSM participants. *Sociology Compass*, 13, e12668. <https://doi.org/10.1111/soc4.12668>
- Simula, B. L., & Sumerau, J. (2019). The use of gender in the interpretation of BDSM. *Sexualities*, 22, 452-477. <https://doi.org/10.1177/1363460717737488>
- Su, Y., & Zheng, L. (2022). Sexual orientation and gender differences in sexual minority identity in China: Extension to asexuality. *Current Psychology*, 41, 8678-8691. <https://doi.org/10.1007/s12144-021-01354-x>

- Tan, H. C., Ho, J. A., Kumarusamy, R., & Sambasivan, M. (2022). Measuring social desirability bias: Do the full and short versions of the Marlowe-Crowne Social Desirability scale matter? *Journal of Empirical Research on Human Research Ethics*, *17*, 382-400.  
<https://doi.org/10.1177/15562646211046091>
- van Anders, S. M. (2015). Beyond sexual orientation: Integrating gender/sex and diverse sexualities via sexual configurations theory. *Archives of Sexual Behaviour*, *44*, 1177-1213. <https://doi.org/10.1007/s10508-015-0490-8>
- Van Der Walt, H. (2014). Practitioner psychologists' understandings of bondage/discipline, dominance/submission, sadomasochism (BDSM): Shared or separate from those who practise it [Doctoral dissertation, Canterbury Christ Church University].  
<https://repository.canterbury.ac.uk/item/87354/practitioner-psychologists-understandings-of-bondage-discipline-dominance-submission-sadism-shared-or-separate-from-those-who-practise-it>
- Vautier, S. (2011). Measuring change with multiple visual analog scales: Application to tense arousal. *European Journal of Psychological Assessment*, *27*, 111-120.  
<https://doi.org/10.1027/1015-5759/a000051>
- Walters, L., McCluskie, E. N., Roberge, M., Moazami, S., & Lalumière, M. L. (2025). A systematic review of changes in sexual attractions. *Canadian Journal of Human Sexuality*, *34*, 106-123. <https://doi.org/10.3138/cjhs-2024-0030>
- Welsch, R., Schmidt, A. F., Turner, D., & Rettenberger, M. (2021). Test-retest reliability and temporal agreement of direct and indirect sexual interest measures. *Sexual Abuse*, *33*, 339-360. <https://doi.org/10.1177/1079063220904354>

- Wibowo, E., Wong, S. T., Wassersug, R. J., & Johnson, T. W. (2022). Paraphilic sexual attraction to males without genitals is associated with traumatic childhood experience, body image, and thoughts/behaviors related to genital ablation. *Archives of Sexual Behaviour*, 1-12. <https://doi.org/10.1007/s10508-022-02427-z>
- Wiederman, M. W. (1999). Volunteer bias in sexuality research using college student participants. *Journal of Sex Research*, 36, 59-66. <https://doi.org/10.1080/00224499909551968>
- Wilson, G. D. (1987). Male-female differences in sexual activity, enjoyment and fantasies. *Personality and Individual Differences*, 8, 125-127. [https://doi.org/10.1016/0191-8869\(87\)90019-5](https://doi.org/10.1016/0191-8869(87)90019-5)
- Yu, T., Chen, J., Gu, N. Y., Hay, J. W., & Gong, C. L. (2022). Predicting panel attrition in longitudinal HRQoL surveys during the COVID-19 pandemic in the US. *Health and Quality of Life Outcomes*, 20, 104. <https://doi.org/10.1186/s12955-022-02015-8>
- Zietsch, B. P., & Sidari, M. J. (2020). The Kinsey scale is ill-suited to most sexuality research because it does not measure a single construct. *Proceedings of the National Academy of Sciences*, 117, 27080-27080. <https://doi.org/10.1073/pnas.2015820117>

**Table 3. 1***Sociodemographic Information.*

	Time 1 <i>n</i> (%)	Time 2 <i>n</i> (%)	Time 3 <i>n</i> (%)
Province of residence			
Ontario	604 (90.1)	294 (88.6)	126 (86.3)
Quebec	55 (8.2)	33 (9.9)	15 (10.3)
New Brunswick	3 (0.4)	-	1 (0.7)
Newfoundland and Labrador	2 (0.3)	-	-
Nova Scotia	2 (0.3)	1 (0.3)	-
Alberta	1 (0.1)	1 (0.3)	1 (0.7)
Prince Edward Island	1 (0.1)	2 (0.6)	1 (0.7)
British Columbia	1 (0.1)	-	1 (0.7)
Saskatchewan	1 (0.1)	1 (0.3)	1 (0.7)
Gender (as described by participant)			
Woman	529 (79)	268 (80.7)	122 (83.6)
Man	128 (19)	56 (16.9)	20 (13.7)
Non-binary	7 (1.0)	4 (1.2)	2 (1.4)
Gender Fluid	3 (0.4)	1 (0.3)	-
Transgender	1 (0.1)	-	1 (0.7)
Agender	1 (0.1)	1 (0.3)	1 (0.7)
Other (not man or woman)	1 (0.1)	1 (0.3)	-
Genderqueer	-	1 (0.3)	-
Specified Gender			
Cisgender	645 (96.3)	322 (97.0)	141 (96.6)
Transgender	12 (1.8)	7 (2.1)	3 (2.1)
Neither Cisgender nor Transgender	9 (1.3)	2 (0.6)	2 (1.4)
Unsure	4 (0.6)	1 (0.3)	-
Sexual Orientation			
Heterosexual	434 (64.8)	208 (62.7)	84 (57.5)
Bisexual	94 (14)	54 (16.3)	25 (17.1)
Mostly Heterosexual	40 (6.0)	14 (4.2)	15 (10.3)
Questioning	25 (3.7)	15 (4.5)	4 (2.7)
Queer	23 (3.4)	15 (4.5)	6 (4.1)
Pansexual	19 (2.8)	10 (3.0)	7 (4.8)
Homosexual	13 (1.9)	6 (1.8)	1 (0.7)
Asexual	11 (1.6)	6 (1.8)	2 (1.4)
Other	6 (0.9)	1 (0.3)	-
Mostly Homosexual	3 (0.4)	2 (0.6)	1 (0.7)
Demisexual	2 (0.3)	1 (0.3)	1 (0.7)
Relationship Status			
Single (not dating and not having sex)	337 (50.3)	162 (48.8)	82 (56.2)
In a committed relationship	210 (31.3)	106 (31.9)	41 (28.1)
Single (not dating but having sex)	105 (15.7)	52 (15.7)	13 (8.9)
In a common-law relationship	6 (0.9)	6 (1.8)	6 (4.1)
Married to a partner	5 (0.7)	4 (1.2)	2 (1.4)
Other	4 (0.6)	2 (0.6)	2 (1.4)
In multiple committed relationships	2 (0.3)	-	-
In multiple common-law relationships	1 (0.1)	-	-

*Note.* Any category with “ - “ has no participant.

**Table 3. 2***Participant Scores on the Sexual Attraction Inventory (SAI) Over Time.*

Item Number and Label	Time 1				Time 2				Time 3			
	<i>M (SD)</i> Full Sample	Mdn	<i>M (SD)</i> Completers	Mdn	<i>M (SD)</i> Full Sample	Mdn	<i>M (SD)</i> Completers	Mdn	<i>M (SD)</i> Full Sample	Mdn	<i>M (SD)</i> Completers	Mdn
1. People who present as men	70.80 (36.73)	87	70.63 (34.55)	83	71.69 (36.09)	88	70.13 (35.48)	87	74.86 (32.93)	88	71.77 (34.44)	85
2. People who present as women	44.23 (37.69)	39	45.68 (38.19)	50	44.14 (38.10)	45	44.71 (38.26)	49	44.99 (36.59)	40	47.91 (36.64)	51
3. People who present as a gender outside the binary of men/women	20.87 (28.42)	5	26.59 (31.77)	12	22.00 (29.08)	7	23.66 (28.29)	10	23.67 (29.04)	10	25.02 (29.08)	10
4. Senior adults (65+)	2.87 (8.50)	0	3.82 (9.32)	0	3.98 (10.39)	0	5.79 (13.31)	0	4.76 (12.22)	0	5.16 (12.64)	0
5. Adults (35-65)	30.11 (29.23)	23	36.51 (32.20)	30	33.79 (28.77)	30	37.79 (31.23)	30	35.75 (31.81)	29	39.37 (32.23)	37
6. Young adults (18-34)	85.14 (20.02)	93	83.02 (22.92)	91	84.12 (21.15)	92	81.54 (21.68)	88	83.51 (21.90)	91	82.43 (21.27)	88
7. Older adolescents (16-17)	21.37 (29.08)	4	22.52 (27.24)	9	21.53 (27.48)	8	24.52 (28.00)	11	19.09 (26.48)	4	20.75 (27.61)	5
8. Younger adolescents (12-15)	1.41 (6.28)	0	1.69 (6.95)	0	1.41 (5.68)	0	2.30 (6.66)	0	2.24 (7.89)	0	2.90 (9.04)	0
9. Children (4-11)	0.24 (2.48)	0	0.08 (0.51)	0	0.18 (2.28)	0	0.43 (4.00)	0	0.21 (1.55)	0	0.25 (1.78)	0
10. Toddlers (1-3)	0.19 (2.50)	0	0.05 (0.32)	0	0.11 (1.44)	0	0.30 (2.54)	0	0.15 (1.09)	0	0.14 (1.18)	0
11. Babies (0-11 months)	0.31 (4.12)	0	0.07 (0.51)	0	0.27 (3.36)	0	0.76 (5.95)	0	0.17 (0.76)	0	0.12 (0.63)	0
12. Touching material like rubber, PVC, or leather	8.00 (18.01)	0	9.50 (19.08)	0	7.82 (18.31)	0	9.97 (18.17)	0	7.90 (16.61)	0	8.35 (16.54)	0
13. Touching an object like shoes, gloves, or plush toys	4.06 (12.65)	0	5.59 (15.83)	0	3.94 (12.64)	0	4.90 (11.80)	0	6.15 (15.29)	0	6.92 (16.15)	0
14. Kissing, fondling, and touching someone's feet	8.10 (20.04)	0	8.90 (22.50)	0	6.48 (16.87)	0	6.52 (16.45)	0	7.13 (18.45)	0	5.51 (13.80)	0
15. Having sex with an animal (e.g., cats, dogs, horses)	0.37 (2.98)	0	0.35 (1.72)	0	0.64 (5.52)	0	1.58 (9.29)	0	0.64 (4.74)	0	0.36 (2.32)	0
16. Being spanked, beaten, or whipped by someone	27.11 (33.17)	8	28.38 (33.75)	12	28.58 (32.99)	11	28.38 (32.57)	11	33.05 (34.16)	23	31.49 (34.16)	15
17. Spanking, beating, or whipping someone	16.14 (25.11)	1	19.82 (28.21)	4	16.43 (25.32)	2	20.32 (28.86)	4	14.83 (22.76)	1	16.94 (25.04)	2
18. Being urinated on by someone (e.g., golden showers)	3.05 (12.17)	0	5.62 (14.62)	0	3.44 (13.20)	0	6.38 (17.77)	0	4.22 (13.33)	0	4.81 (14.63)	0
19. Urinating on someone (e.g., golden showers)	2.64 (9.88)	0	3.89 (10.54)	0	3.39 (12.31)	0	4.86 (14.14)	0	3.84 (11.36)	0	5.08 (13.06)	0
20. Imagining yourself as someone of another gender	9.13 (22.16)	0	9.47 (20.72)	0	6.68 (17.78)	0	9.20 (19.36)	0	8.87 (21.66)	0	7.45 (18.22)	0
21. Dressing up as someone of another gender	5.48 (15.44)	0	6.41 (13.57)	0	5.10 (14.57)	0	8.47 (18.11)	0	5.25 (13.47)	0	6.46 (14.95)	0
22. Being tied or handcuffed	43.73 (36.63)	47	45.41 (36.52)	45	42.98 (35.56)	43	42.31 (36.14)	32	43.91 (37.04)	46	44.10 (36.50)	47
23. Tying or handcuffing someone	33.82 (33.67)	25	39.25 (35.02)	30	31.58 (32.52)	21	37.19 (34.92)	26	34.42 (32.85)	27	37.92 (33.86)	31

24. Being controlled or dominated by someone	53.74 (36.07)	61	60.05 (32.87)	69	52.10 (35.19)	55	52.61 (34.91)	57	51.28 (36.30)	55	49.56 (36.34)	47
25. Controlling or dominating someone	37.91 (32.17)	34	42.56 (33.36)	37	34.35 (31.52)	28	37.08 (33.75)	29	33.29 (30.92)	25	34.23 (31.40)	28
26. Having sex with an adult woman	37.16 (39.04)	21	40.15 (39.26)	27	36.59 (38.22)	21	41.13 (39.56)	28	42.24 (38.91)	34	42.90 (39.49)	35
27. Having sex with an adult man	57.38 (39.40)	69	61.38 (35.81)	71	61.12 (37.99)	75	60.96 (36.21)	74	66.31 (36.14)	79	64.48 (36.29)	78
28. Having someone verbally humiliate you	9.62 (20.77)	0	11.18 (21.40)	0	11.20 (22.75)	0	12.17 (22.61)	0	12.27 (24.07)	0	12.94 (24.86)	0
29. Verbally humiliating someone	6.68 (17.52)	0	6.98 (15.00)	0	8.13 (20.14)	0	9.45 (21.23)	0	7.58 (17.29)	0	9.17 (19.38)	0
30. Being defecated on by someone (e.g., scat play)	0.58 (5.16)	0	0.24 (1.24)	0	0.38 (3.52)	0	0.42 (2.04)	0	0.36 (1.86)	0	0.45 (2.16)	0
31. Defecating on someone (e.g., scat play)	0.60 (5.51)	0	0.17 (0.99)	0	0.57 (6.29)	0	0.19 (0.99)	0	0.35 (2.09)	0	0.48 (2.43)	0
32. Having your skin cut	3.62 (12.43)	0	5.99 (16.97)	0	3.58 (12.19)	0	6.03 (17.43)	0	5.20 (15.83)	0	5.59 (16.95)	0
33. Cutting someone's skin	2.13 (9.34)	0	2.89 (10.39)	0	2.83 (10.82)	0	4.68 (15.13)	0	3.08 (12.75)	0	3.30 (13.95)	0
34. Having your breathing restricted during sexual activity	25.15 (31.85)	7	27.71 (33.06)	16	25.87 (31.94)	10	24.33 (32.19)	6	25.22 (31.92)	9	24.67 (31.74)	9
35. Touching or rubbing a stranger who is not expecting it	3.23 (11.88)	0	2.52 (9.47)	0	2.53 (9.53)	0	2.94 (10.02)	0	2.37 (8.74)	0	2.30 (7.87)	0
36. Watching an unsuspecting stranger who is not expecting it	5.66 (14.97)	0	8.35 (17.88)	0	4.63 (13.43)	0	6.30 (16.27)	0	7.34 (17.33)	0	8.06 (17.23)	0
37. Exposing your genitals to a stranger who is not expecting it	1.89 (9.10)	0	2.38 (9.11)	0	1.16 (5.61)	0	1.78 (7.04)	0	1.80 (7.09)	0	2.28 (8.03)	0
38. Making obscene phone calls to someone who is not expecting it	4.27 (14.64)	0	4.01 (12.93)	0	2.59 (9.65)	0	4.40 (13.60)	0	3.62 (12.17)	0	4.05 (12.43)	0
39. Forcing someone into sexual activity	2.13 (9.86)	0	1.57 (5.12)	0	1.48 (6.42)	0	1.97 (6.47)	0	2.20 (7.35)	0	2.42 (7.90)	0
40. Pretending to rape someone	2.57 (11.97)	0	3.53 (13.88)	0	2.11 (9.09)	0	3.02 (10.78)	0	2.82 (10.17)	0	2.70 (8.41)	0

*Note.* Mdn = median score; Time 1 full sample  $n = 670$ ; Time 2 full sample  $n = 332$ ; Time 3 full sample  $n = 146$ ; Completers = participants who completed all three time points,  $n = 105$ . Scores could vary from 0 to 100.

**Table 3.3***Ratings of Sexual Attractions at Baseline by Gender.*

Item	Men <i>M (SD)</i>	Women <i>M (SD)</i>	Non-binary+ <i>M (SD)</i>
People who present as men	13.63 (29.85)	85.65 (20.51)	28.46 (27.09)
People who present as women	86.56 (25.11)	33.79 (32.70)	52.31 (38.82)
People who present as a gender outside the binary of men/women	11.07 (19.74)	22.41 (29.15)	54.92 (33.46)
Senior adults (65+)	2.74 (6.66)	2.84 (8.87)	5.46 (9.61)
Adults (35-65)	37.81 (30.19)	28.51 (28.83)	19.54 (23.47)
Young adults (18-34)	89.32 (16.04)	84.82 (19.62)	55.46 (39.25)
Older adolescents (16-17)	28.52 (31.58)	20.08 (28.44)	3.62 (6.65)
Younger adolescents (12-15)	2.52 (7.66)	1.18 (5.96)	0 (0)
Children (4-11)	0.45 (2.21)	0.19 (2.57)	0 (0)
Toddlers (1-3)	0.26 (1.94)	0.18 (2.65)	0 (0)
Babies (0-11 months)	0.17 (1.68)	0.34 (4.64)	0.08 (0.28)
Touching material like rubber, PVC, or leather	5.77 (16.09)	8.39 (18.36)	14.31 (20.41)
Touching an object like shoes, gloves, or plush toys	3.23 (10.36)	4.08 (12.50)	11.46 (29.00)
Kissing, fondling, and touching someone's feet	14.42 (23.37)	6.40 (18.43)	14.77 (32.59)
Having sex with an animal (e.g., cats, dogs, horses)	0.96 (5.47)	0.23 (2.00)	0.08 (0.28)
Being spanked, beaten, or whipped by someone	9.67 (20.36)	31.21 (34.30)	32.23 (34.61)
Spanking, beating, or whipping someone	21.91 (27.27)	14.50 (24.04)	26.08 (35.70)
Being urinated on by someone (e.g., golden showers)	3.78 (13.44)	2.79 (11.56)	6.62 (21.03)
Urinating on someone (e.g., golden showers)	3.75 (11.16)	2.25 (9.18)	7.31 (19.22)
Imagining yourself as someone of another gender	7.38 (20.24)	8.81 (21.42)	39.46 (42.75)
Dressing up as someone of another gender	4.25 (14.97)	5.06 (13.80)	34.54 (40.06)
Being tied or handcuffed	20.97 (30.02)	49.22 (36.15)	44.46 (30.11)
Tying or handcuffing someone	35.30 (34.16)	33.28 (33.35)	41.31 (42.35)
Being controlled or dominated by someone	26.80 (30.84)	60.34 (34.25)	50.62 (34.40)
Controlling or dominating someone	49.94 (33.59)	34.83 (30.99)	44.69 (38.69)
Having sex with an adult woman	78.44 (30.37)	26.88 (33.93)	48.69 (39.70)
Having sex with an adult man	10.76 (28.21)	69.27 (32.63)	32.62 (34.44)
Having someone verbally humiliate you	6.59 (15.84)	10.11 (21.46)	19.31 (30.38)
Verbally humiliating someone	10.22 (21.77)	5.62 (16.06)	15.08 (22.15)
Being defecated on by someone (e.g., scat play)	0.46 (2.83)	0.52 (5.17)	4.23 (14.37)
Defecting on someone (e.g., scat play)	1.13 (9.07)	0.42 (4.01)	2.85 (10.26)
Having your skin cut	2.62 (9.76)	3.64 (12.55)	12.38 (24.20)
Cutting someone's skin	1.21 (4.67)	2.23 (9.99)	6.77 (14.43)
Having your breathing restricted during sexual activity	10.45 (20.35)	28.58 (33.16)	30.00 (30.59)
Touching or rubbing a stranger who is not expecting it	5.25 (15.99)	2.69 (10.47)	5.00 (16.58)
Watching an unsuspecting stranger who is not expecting it	10.60 (20.94)	4.55 (13.05)	2.46 (5.38)
Exposing your genitals to a stranger who is not expecting it	2.06 (10.54)	1.89 (8.84)	0.31 (0.86)
Making obscene phone calls to someone who is not expecting it	3.58 (14.20)	4.50 (14.91)	2.15 (5.11)
Forcing someone into sexual activity	4.84 (14.72)	1.52 (8.30)	0.15 (0.56)
Pretending to rape someone	6.14 (18.32)	1.57 (8.97)	8.15 (25.94)
Factor 1 – men and submissiveness	14.13 (16.90)	47.76 (21.55)	33.95 (25.91)
Factor 2 – women and non-binary genders	58.69 (18.39)	27.69 (29.08)	51.97 (35.15)
Factor 3 – dominance	35.71 (26.98)	27.49 (25.24)	37.36 (35.06)
Factor 4 – urine play	3.77 (11.44)	2.51 (9.72)	6.96 (19.87)

Factor 5 – gender play	5.82 (15.45)	6.94 (15.64)	37.01 (38.55)
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*Note.* Means and standard deviations reported from Time 1;  $n_{\text{men}} = 128$ ,  $n_{\text{women}} = 529$ ,  $n_{\text{non-binary+}} =$

13.



**Table 3. 4***Correlations Between a Measure of Social Desirability and Sexual Attractions at Time 1.*

Item on the SAI	Correlation ( <i>r</i> ) with MCSD-SF	LL	UL
People who present as men	<b>-.08</b>	-.15	-.002
People who present as women	-.04	-.11	.04
People who present as a gender outside the binary of men/women	<b>-.08</b>	-.16	-.01
Senior adults (65+)	<b>-.10</b>	-.18	-.03
Adults (35-65)	<b>-.18</b>	-.25	-.11
Young adults (18-34)	<b>-.11</b>	-.19	-.04
Older adolescents (16-17)	-.06	-.14	.02
Younger adolescents (12-15)	-.06	-.13	.02
Children (4-11)	.03	-.04	.11
Toddlers (1-3)	.03	-.05	.10
Babies (0-11 months)	.03	-.05	.10
Touching material like rubber, PVC, or leather	<b>-.09</b>	-.16	-.01
Touching an object like shoes, gloves, or plush toys	-.03	-.11	.04
Kissing, fondling, and touching someone's feet	.01	-.07	.08
Having sex with an animal (e.g., cats, dogs, horses)	-.04	-.11	.04
Being spanked, beaten, or whipped by someone	<b>-.14</b>	-.21	-.06
Spanking, beating, or whipping someone	-.07	-.14	.01
Being urinated on by someone (e.g., golden showers)	-.06	-.13	.02
Urinating on someone (e.g., golden showers)	-.07	-.15	.001
Imagining yourself as someone of another gender	-.07	-.15	.004
Dressing up as someone of another gender	<b>-.10</b>	-.17	-.02
Being tied or handcuffed	<b>-.15</b>	-.22	-.07
Tying or handcuffing someone	<b>-.09</b>	-.16	-.01
Being controlled or dominated by someone	<b>-.18</b>	-.25	-.10
Controlling or dominating someone	<b>-.15</b>	-.22	-.07
Having sex with an adult woman	-.03	-.10	.05
Having sex with an adult man	<b>-.12</b>	-.20	-.05
Having someone verbally humiliate you	<b>-.11</b>	-.19	-.04
Verbally humiliating someone	<b>-.13</b>	-.21	-.06
Being defecated on by someone (e.g., scat play)	-.04	-.12	.04
Defecating on someone (e.g., scat play)	-.05	-.13	.03
Having your skin cut	-.07	-.15	.01
Cutting someone's skin	-.07	-.14	.01
Having your breathing restricted during sexual activity	<b>-.15</b>	-.23	-.08
Touching or rubbing a stranger who is not expecting it	<b>-.14</b>	-.21	-.06
Watching an unsuspecting stranger who is not expecting it	<b>-.11</b>	-.19	-.04
Exposing your genitals to a stranger who is not expecting it	-.07	-.15	.001
Making obscene phone calls to someone who is not expecting it	<b>-.09</b>	-.17	-.02
Forcing someone into sexual activity	-.03	-.11	.04
Pretending to rape someone	<b>-.12</b>	-.19	-.04
Factor 1 – men and submissiveness	<b>-.18</b>	-.25	-.10
Factor 2 – women and non-binary genders	-.05	-.13	.02
Factor 3 – dominance	<b>-.12</b>	-.19	-.05
Factor 4 – urine play	-.07	-.14	.01
Factor 5 – gender play	<b>-.09</b>	-.17	-.02

*Note.* Correlations calculated at Time 1 ( $N = 670$ ); MCSD-SF = Marlowe-Crowne Social Desirability Scale – Short Form; LL = 95% confidence interval lower limit, UL = 95% confidence interval upper limit; correlations in bold have 95% confidence intervals that do not include 0.

**Table 3. 5***Test-Retest Reliabilities of Sexual Attraction Scores Over 2 Weeks.*

Item	<i>r</i>	ICC	LL	UL
People who present as men	.96	<b>.98</b>	.98	.98
People who present as women	.94	<b>.97</b>	.96	.98
People who present as a gender outside the binary of men/women	.86	<b>.93</b>	.91	.94
Senior adults (65+)	.59	<b>.72</b>	.65	.77
Adults (35-65)	.73	<b>.84</b>	.80	.87
Young adults (18-34)	.75	<b>.86</b>	.82	.88
Older adolescents (16-17)	.70	<b>.83</b>	.78	.86
Younger adolescents (12-15)	.63	<b>.77</b>	.72	.82
Children (4-11)	.53	.44	.30	.55
Toddlers (1-3)	.71	.36	.21	.49
Babies (0-11 months)	.11	.08	-.15	.25
Touching material like rubber, PVC, or leather	.63	<b>.77</b>	.71	.81
Touching an object like shoes, gloves, or plush toys	.41	.59	.48	.67
Kissing, fondling, and touching someone's feet	.70	<b>.81</b>	.76	.84
Having sex with an animal (e.g., cats, dogs, horses)	.43	.40	.25	.51
Being spanked, beaten, or whipped by someone	.79	<b>.88</b>	.85	.90
Spanking, beating, or whipping someone	.76	<b>.86</b>	.83	.89
Being urinated on by someone (e.g., golden showers)	.80	<b>.89</b>	.86	.91
Urinating on someone (e.g., golden showers)	.71	<b>.83</b>	.78	.86
Imagining yourself as someone of another gender	.65	<b>.78</b>	.72	.82
Dressing up as someone of another gender	.63	<b>.77</b>	.72	.82
Being tied or handcuffed	.80	<b>.88</b>	.85	.91
Tying or handcuffing someone	.71	<b>.82</b>	.77	.86
Being controlled or dominated by someone	.78	<b>.87</b>	.83	.90
Controlling or dominating someone	.71	<b>.82</b>	.76	.86
Having sex with an adult woman	.90	<b>.95</b>	.93	.96
Having sex with an adult man	.85	<b>.92</b>	.90	.93
Having someone verbally humiliate you	.71	<b>.83</b>	.79	.86
Verbally humiliating someone	.68	<b>.81</b>	.76	.84
Being defecated on by someone (e.g., scat play)	.88	<b>.93</b>	.92	.95
Defecating on someone (e.g., scat play)	.41	.43	.30	.54
Having your skin cut	.81	<b>.89</b>	.87	.91
Cutting someone's skin	.74	<b>.84</b>	.80	.87
Having your breathing restricted during sexual activity	.82	<b>.90</b>	.88	.92
Touching or rubbing a stranger who is not expecting it	.40	.57	.47	.66
Watching an unsuspecting stranger who is not expecting it	.61	<b>.76</b>	.70	.80
Exposing your genitals to a stranger who is not expecting it	.56	<b>.71</b>	.64	.77
Making obscene phone calls to someone who is not expecting it	.57	<b>.70</b>	.62	.76
Forcing someone into sexual activity	.17	.29	.12	.43
Pretending to rape someone	.64	<b>.75</b>	.69	.80
Factor 1 – men and submissiveness	.92	<b>.96</b>	.94	.97
Factor 2 – women and non-binary genders	.94	<b>.97</b>	.96	.98
Factor 3 – dominance	.82	<b>.89</b>	.85	.92
Factor 4 – urine play	.77	<b>.87</b>	.84	.90
Factor 5 – gender play	.71	<b>.83</b>	.79	.87

*Note.*  $N = 332$ ; ICC = intraclass correlation coefficient, LL = 95% confidence interval lower limit, UL = 95% confidence interval upper limit. ICC values above .70 have been bolded.

**Table 3. 6***Pattern Matrix of the Exploratory Factor Analysis Five-Factor Model.*

Items from the SAI Included	Factors					Communality
	1	2	3	4	5	
	M+Sub	W+NB	Dom	Uri	GenP	
% Variance explained	11.90	16.30	23.19	6.42	6.14	
Being controlled or dominated by someone	.84					.72
Being tied or handcuffed	.79					.76
Having sex with an adult man	.71					.56
Being spanked, beaten, or whipped by someone	.67					.58
People who present as men	.57	-.49				.66
Having your breathing restricted during sexual activity	.43					.43
Having someone verbally humiliate you	.43					.26
People who present as women		1.03				.98
Having sex with an adult woman		.90				.81
People who present as a gender outside the binary of men/women		.45				.47
Tying or handcuffing someone			.75			.68
Spanking, beating, or whipping someone			.72			.55
Controlling or dominating someone			.71			.57
Being urinated on by someone				1.02		.99
Urinating on someone				.74		.61
Dressing up as someone of another gender					.88	.73
Imagining yourself as someone of another gender					.69	.50

*Note.*  $N = 660$ ; SAI = Sexual Attraction Inventory; M+Sub = attraction to men and submissiveness, W+NB = attraction to women and non-binary genders, Dom = attraction to dominance, Uri = attraction to urine play, GenP = attraction to gender play; total variance explained = 64%.

**Table 3. 7***Evaluating Changes in Sexual Attractions and Factor Scores Over Time.*

Items on the Sexual Attraction Inventory	<sup>a</sup> Change between Time 1 – 3 ( $d_{wsc}$ )	<sup>a</sup> Bootstrapped lower confidence interval (2.50%)	<sup>a</sup> Bootstrapped upper confidence interval (97.50%)	<sup>b</sup> Average units of absolute individual change from Time 1 – 2	<sup>b</sup> Average units of absolute individual change from Time 1 – 3	<sup>b</sup> Time 1 – 3 RCI	<sup>b</sup> $N$ (%) of participants who reliably changed
People who present as men	0.28	0.22	0.37	6.82	10.15	13.54	28 (27%)
People who present as women	0.35	0.27	0.43	7.48	12.70	18.34	21 (20%)
People who present as a gender outside the binary of men/women	0.38	0.30	0.48	9.41	12.41	23.30	20 (19%)
Senior adults (65+)	0.49	0.38	0.61	3.31	4.84	13.81	12 (11%)
Adults (35-65)	0.58	0.48	0.70	13.61	18.56	34.08	19 (18%)
Young adults (18-34)	0.54	0.43	0.67	8.91	11.81	23.76	12 (11%)
Older adolescents (16-17)	0.55	0.44	0.67	12.12	14.52	30.11	17 (16%)
Younger adolescents (12-15)	0.43	0.32	0.54	1.24	3.10	8.69	6 (6%)
Touching material like rubber, PVC, or leather	0.58	0.45	0.73	7.28	9.97	24.89	17 (16%)
Kissing, fondling, and touching someone's feet	0.48	0.36	0.60	6.29	10.07	28.44 <sup>a</sup>	12 (11%)
Being spanked, beaten, or whipped by someone	0.52	0.42	0.63	12.42	17.83	32.40	21 (20%)
Spanking, beating, or whipping someone	0.59	0.49	0.70	10.39	16.82	29.26	21 (20%)
Being urinated on by someone (e.g., golden showers)	0.40	0.27	0.55	2.41	4.83	12.26	14 (13%)
Urinating on someone (e.g., golden showers)	0.43	0.31	0.55	2.80	3.85	10.43	13 (12%)
Imagining yourself as someone of another gender	0.44	0.31	0.58	6.42	9.19	26.50	10 (10%)
Dressing up as someone of another gender	0.44	0.32	0.58	4.93	6.10	17.65	9 (9%)
Being tied or handcuffed	0.52	0.43	0.63	14.07	20.31	35.07	25 (24%)
Tying or handcuffing someone	0.63	0.52	0.74	14.07	22.44	41.18	20 (19%)
Being controlled or dominated by someone	0.56	0.46	0.68	16.54	21.02	32.85	23 (22%)
Controlling or dominating someone	0.78	0.66	0.90	16.88	25.69	39.23	28 (27%)
Having sex with an adult woman	0.41	0.32	0.51	8.33	15.18	24.34	22 (21%)
Having sex with an adult man	0.45	0.36	0.57	11.92	16.81	28.07	20 (19%)
Having someone verbally humiliate you	0.45	0.32	0.58	7.94	10.51	15.07	19 (18%)
Verbally humiliating someone	0.48	0.35	0.63	6.64	7.64	26.17	13 (12%)
Being defecated on by someone (e.g., scat play)	0.33	0.23	0.45	0.33	0.49	0.87	11 (10%)
Having your skin cut	0.23	0.13	0.34	2.54	3.89	19.66	6 (6%)
Cutting someone's skin	0.22	0.12	0.36	2.09	2.70	9.75	6 (6%)
Having your breathing restricted during sexual activity	0.53	0.42	0.65	11.29	14.82	28.98	21 (20%)
Watching an unsuspecting stranger who is not expecting it	0.61	0.48	0.74	4.54	8.45	25.93	16 (15%)
Exposing your genitals to a stranger who is not expecting it	0.34	0.23	0.45	1.49	3.05	14.53	6 (6%)
Making obscene phone calls to someone who is not expecting it	0.34	0.24	0.47	3.48	4.62	20.95	6 (6%)
Pretending to rape someone	0.29	0.19	0.41	2.45	2.92	18.91	5 (5%)
Factor 1 – men and submissiveness	0.45	0.36	0.56	7.17	11.01	13.14	29 (28%)
Factor 2 – women and non-binary genders	0.36	0.26	0.46	6.40	11.17	15.32	23 (22%)

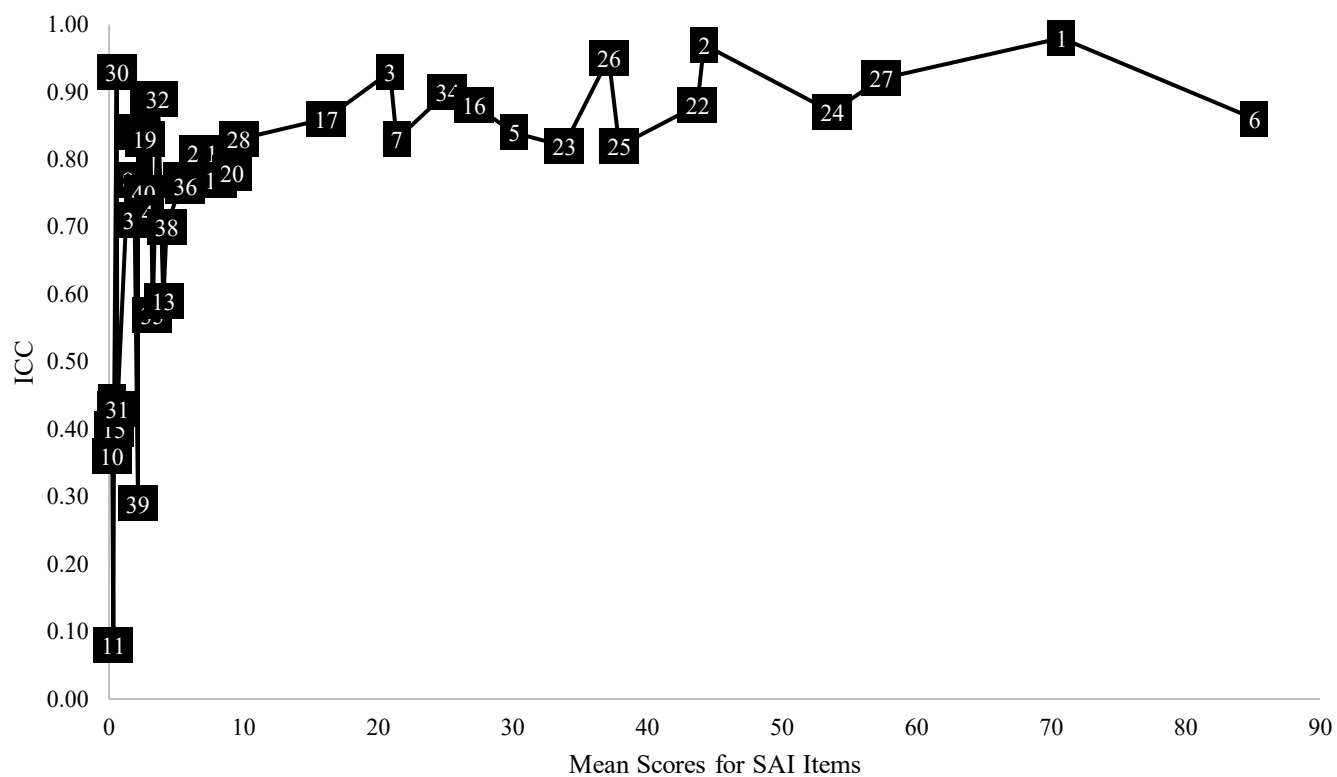
Factor 3 – dominance	0.67	0.55	0.80	11.54	17.80	25.37	26 (25%)
Factor 4 – urine play	0.41	0.29	0.54	2.87	5.15	11.99	15 (14%)
Factor 5 – gender play	0.42	0.31	0.58	6.17	6.46	17.92	13 (12%)

*Note.* Only items demonstrating acceptable test re-test reliability were included; <sup>a</sup> $n = 144$  (i.e., participants who completed Time 1 and 3); <sup>b</sup> $n = 105$  (i.e., completers of all time points so that ICC values could be used to calculate RCIs); RCI = reliable change index; Time 2 = two weeks after Time 1; Time 3 = six months after Time 1.



**Figure 3. 2**

*Plotting Mean Scores for Sexual Attractions at Baseline Against Test-Retest Reliabilities.*



*Note.*  $N = 332$ ; numbers depicted in the figure refer to the numbered items on the SAI (see Table 2 for legend); ICC = intraclass correlation coefficient; SAI = Sexual Attraction Inventory.

## Supplemental Materials

### *Comparison between the Paraphilia Scale and Sexual Attractions Inventory.*

Paraphilia Scale	Sexual Attractions Inventory	Description of Changes <sup>a</sup>
You are having sex with an adult woman	having sex with an adult woman	
You are touching a material like rubber, PVC, or leather	touching material like rubber, PVC, or leather	
You are having sex with a boy (age 12-14)	N/A	Asked about in different section of SAI that gives participants options to select from diverse age categories
You are kissing, fondling, and touching someone's feet	kissing, fondling, and touching someone's feet	
You are having sex with an animal	having sex with an animal (e.g., cats, dogs, horses)	Provided examples for clarity
You are being spanked, beaten, or whipped by someone	being spanked, beaten, or whipped by someone	
You are being urinated on by someone ("golden showers")	bring urinated on by someone (e.g., golden showers)	Replaced quotation of specific act and replaced with "e.g.," to indicate that this is one type of descriptor for sexual act
You are having your feet kissed, fondled, and touched	N/A	Dawson et al. (2016) state that this item does not clearly refer to paraphilic activities
You are treating someone as an animal	N/A	Dawson et al. (2016) state that this item does not clearly refer to paraphilic activities
You are touching an object like shoes, gloves, or plush toys	touching an object like shoes, gloves, or plush toys	
You are having sex with an adult man	having sex with an adult man	
You are imagining yourself as someone of the opposite sex	imagining yourself as someone of another gender	Dropped "opposite" and replaced with "another" for breadth of gender diversity. Replaced "sex" with "gender" as language in DSM-5-TR (American Psychiatric Association, 2022) about crossdressing refers to both gender and sex but describes comorbidity with gender-related phenomena such as gender dysphoria and autogynephelia.
You are tying or handcuffing someone	tying or handcuffing someone	
You are being tied or handcuffed	being tied or handcuffed	
You are controlling or dominating someone	controlling or dominating someone	
You are dressing up as someone of the opposite sex	dressing up as someone of another gender	Dropped "opposite" and replaced with "another" for accuracy. Replaced "sex" with "gender" as language in DSM-5-TR (American Psychiatric Association, 2022) about crossdressing refers to both gender and sex but describes comorbidity with gender-related phenomena such as gender dysphoria and autogynephelia.
You are having sex with a boy	N/A	Asked about in different section of SAI that

below the age of 12		gives participants options to select from diverse age categories
You are spanking, beating, or whipping someone	spanking, beating, or whipping someone	
You are verbally humiliating someone	verbally humiliating someone	
You are being forced by someone into sexual activity	N/A	Dawson et al. (2016) state that this item does not clearly refer to paraphilic activities
You are having your breathing restricted during sexual activity	having your breathing restricted during sexual activity	Given that participants may interpret this as inclusive to autoerotic asphyxiation (e.g., Baxendale et al., 2019), we included only one item regarding restricted breathing in this measure development study.
You are seeing someone unconscious or unable to move	N/A	Dawson et al. (2016) state that this item does not clearly refer to paraphilic activities
You are having sex with a girl (age 12-14)	N/A	Asked about in different section of SAI that gives participants options to select from diverse age categories
You are urinating on someone (“golden showers”)	urinating on someone (e.g., golden showers)	Replaced quotation of specific act and replaced with “e.g.,” to indicate that this is one type of descriptor for sexual act
You are being defecated on by someone (“scat”)	being defecated on by someone (e.g., scat play)	Replaced quotation of specific act and replaced with “e.g.,” to indicate that this is one type of descriptor for sexual act
You are cutting someone’s skin	cutting someone's skin	
You are touching or rubbing a stranger who is not expecting it	touching or rubbing a stranger who is not expecting it	
You are having sex with a girl below the age of 12	N/A	Asked about in different section of SAI that gives participants options to select from diverse age categories
You are restricting someone’s breathing during sexual activity	N/A	Dropped as we decided to include one item pertaining to restricted breathing that may be interpreted in multiple ways by participants and to reduce overlap in ratings.
You are pretending to rape someone	pretending to rape someone	
You are having someone verbally humiliate you	having someone verbally humiliate you	
You are being treated as an animal	N/A	Dawson et al. (2016) state that this item does not clearly refer to paraphilic activities
You are watching an unsuspecting stranger while they undress	watching an unsuspecting stranger while they undress	
You are exposing your penis to a stranger who is not expecting it	exposing your genitals to a stranger who is not expecting it	
You are having your skin cut	having your skin cut	
You are being controlled or dominated by someone	being controlled or dominated by someone	
You are defecating on someone (“scat”)	defecating on someone (e.g., scat play)	Replaced quotation of specific act and replaced with “e.g.,” to indicate that this is one type of

		descriptor for sexual act
You are making obscene phone calls to someone who is not expecting it	making obscene phone calls to someone who is not expecting it	
You are forcing someone into sexual activity	forcing someone into sexual activity	
You are having someone pretend to rape you	N/A	Dawson et al. (2016) state that this item does not clearly refer to paraphilic activities

*Notes.* <sup>a</sup> = All items had the wording “you are” dropped from the item and replaced by adding “current” in front of “sexual attractions” in the item prompt; N/A = not applicable (i.e., the item was not included in the SAI). The Paraphilia Scale used the prompt, “Please rate how sexually arousing or sexually repulsive you currently find each of the following activities, whether you have tried it or not.” The Sexual Attraction Inventory used the prompt “Please rate your current sexual attraction for the following.”

**Chapter 4: Stability and Change in Diverse Sexual Attractions Over One Year:  
Findings from an International Sample**

### Abstract

Sexual attraction to gender targets (e.g., men/women) shows some degree of change over time. People have sexual attractions to diverse targets or activities beyond gender, but the extent of change in these attractions is unknown. The aim of this study was to measure changes in sexual attraction to various targets and activities over one year in two samples of international participants. A 43-item self-report measure, the Sexual Attraction Inventory (SAI), was administered to 2,000 participants thrice over one year (i.e., at baseline, six months later, and 12 months later). Participants rated their sexual attraction to diverse targets and activities, including paraphilic targets and activities. Change was evaluated using two methods: An effect size based on the standardized absolute difference between scores at baseline and 12 months later, and reliable change indices (RCIs) over one year. Effect sizes varied with a range of .11 (“toddlers”) to .59 (“adults”) while RCIs varied from 1.4% of the sample reliably changing on their sexual attraction to “children” to 20.3% reliably changing on “spanking, beating, or whipping someone”. Group-based trajectory modelling was used to explore the types of change in sexual attraction for each target/act. There were several trajectories of change, but most target/act items had a large no-change group. Mean change scores were plotted by gender, sexual orientation, and age to explore their potential influences. Men and women changed comparably overall, but on different items. Mostly homosexual/questioning and bisexual participants typically changed more than participants of other sexual orientations. Participants’ degree of change did not vary much with age. Results are interpreted in the context of the literature on sexual fluidity.

*Keywords:* Change, sexual attractions, paraphilia, longitudinal

Sexual attraction has been defined as an orienting response to a stimulus (persons, attributes, contexts, acts, etc.) that generates sexual states (e.g., sexual behaviors, arousal, fantasy, or interest; Walters et al., 2025). People report sexual attraction to many diverse stimuli, including genders, ages, acts, and objects (e.g., Walters & Lalumière, 2025). Additionally, the targets and magnitude of sexual attractions change with time (Diamond, 2000; 2016; Diamond et al., 2017; Diamond et al., 2020). This change is a subset of sexual fluidity (a broader term that includes changes in sexual identity and orientation) and likely maps onto different “types” or trajectories of change and is likely influenced by various biographic factors, such as gender, age, or sexual orientation (Diamond, 2016; Diamond et al., 2017; Katz-Wise & Todd, 2022). The main goal of the present study is to use a self-report measure developed by Walters and Lalumière (2025) to evaluate the degree of change over one year in sexual attractions towards various targets and acts. A secondary goal is to explore trajectories of change in sexual attractions over a year. A third and final goal was to explore differences in changes in sexual attractions among groups defined by gender, age, and sexual orientation.

### **Changes in Sexual Attractions**

Changes in sexual attractions have been documented and studied in numerous samples. In a birth cohort from New Zealand ( $n = 1,037$ ), women changed more than men in their self-reported sexual attractions to other men/women over 16 years (Dickson et al., 2013). Changes in sexual attraction have also been documented in an asexual sample from China ( $n = 168$ ; Su & Zheng, 2023); asexual participants typically experienced an increase in sexual attraction to men/women over a 1–2-year period. Diamond’s research documents sexual attraction changes in women over 10 years (Diamond, 2008), explores the influence of sexual orientation and gender

(Diamond, 2016; Diamond et al., 2017), and defines different types of change (Diamond et al., 2020).

These studies are among the few that have examined changes in sexual attractions. In a systematic review of this empirical literature by Walters et al. (2025), 18% of a pooled sample of 8,008 participants experienced some change in self-reported sexual attractions over a median period of approximately 20 months. All the included studies in this review focused on changes in gender-based sexual attractions. The extent of changes in atypical or paraphilic sexual attractions remains unknown. Further, it is unclear if changes in sexual attractions are generalized (i.e., a person changes in their overall sexual attractions) or stimulus specific (i.e., changing differently on sexual attraction to different targets/acts; different trajectories; see Diamond et al., 2020). This information can be valuable to further develop theories of sexual attraction and human sexuality broadly (i.e., sexual fluidity; Diamond, 2000). Further, this knowledge can help inform future clinical interventions to support people reporting concerns with their sexual attractions (i.e., Davis & Darjee, 2025; Przeworski et al., 2021).

### **Measuring Changes in Sexual Attractions**

To measure changes in sexual attraction to diverse targets and activities, the Sexual Attraction Inventory (SAI) was developed and psychometrically evaluated in a sample of 670 university students in Ottawa, Canada, by the authors of the present study. Within this sample, scores on the SAI showed evidence of convergent validity with the Kinsey scale and acceptable two-week test-retest reliability for 32 out of 40 items. The SAI detected changes in sexual attractions to different stimuli (i.e., ages, genders, paraphilic stimuli) over six months. The SAI was well-received by participants, who rated it as highly effective, acceptable, and clear. Scores on the SAI were negatively but weakly correlated to a measure of social desirability (i.e.,

Marlowe-Crowne Social Desirability, Short Form; Crowne & Marlowe, 1960). This was interpreted to mean that there was little connection between socially desirable responding and scores on the SAI.

At least some participants in the Walters and Lalumière (2025) study reported sexual attraction to each of the 40 items on the SAI. On average, participants were most sexually attracted to “young adults” and least sexually attracted to “babies” and “toddlers”. Additionally, the SAI detected changes among these sexual attractions over six months, particularly for attractions related to dominance and submissiveness. Change scores were analyzed using effect sizes of difference scores and reliable change indices. We concluded that the SAI is a viable measure of sexual attractions and is sensitive to changes that may occur over time.

Many of the items on the SAI, particularly those related to paraphilias, had low base rates; that is, few participants responded with a score over 0 (on a scale of 0 to 100). Additionally, a pattern was observed where items with mean ratings below 10 produced unreliable responses over a two-week period. However, this study was limited in that it was done with a student sample. With a larger sample from the public, there is a greater likelihood of capturing participants who may reliably endorse more atypical attractions over time, allowing for more robust analyses of change, exploration of trajectories of change, and comparison between groups (e.g., men and women).

### **Trajectories of Change**

People experience variable patterns of change in sexual attraction based on the target or act (Walters & Lalumière, 2025). Abé (2025) recently proposed the concept of sexual priors to understand how people develop an attraction toward certain stimuli. The basic premise is that, after perception, a stimulus is cognitively evaluated against both learned (e.g., previous

experience) and innate (e.g., “basic sex-specific physical features”; Abé, 2025) prior information. This evaluation determines how attracted the person feels toward the stimulus, which then influences a bidirectional relationship with desire/motivation and arousal (see Figure 5 of Abé, 2025). Experiences with the stimulus can then modify the sexual attraction experienced subsequently.

If people have varied degrees of exposure or engagement with certain targets/acts, there are likely different types of trajectories of change in their sexual attraction to these targets/acts over time. Knowing whether specific trajectories are commonly observed in sexual attraction to certain targets/acts would be informative in evaluating interaction effects between the rater (e.g., gender, age, sexual orientation) and the stimulus rated. Therefore, an additional goal of the present study was to identify discrete trajectories of change as a function of the target of attraction.

### **Biographic Influences on Changes in Sexual Attractions**

People experience changes in sexual attractions at different rates (Diamond, 2008; Diamond et al., 2017; Katz-Wise & Hyde, 2015; Mock & Eibach, 2012). This can be captured by studies of “sexual fluidity” but differs in that sexual fluidity also includes change in sexual identity, orientation, and sometimes behaviors (Diamond, 2008). Three well-studied biographic influences of changes in sexual attractions are gender, sexual orientation, and age. These influences have been studied in the context of gender-based sexual attractions; however, it remains unknown how (or if) gender, sexual orientation, and age change sexual attractions to diverse targets and acts (Diamond et al., 2017; 2020; Dickson et al., 2013; McClintock & Herdt, 1996; Su & Zheng, 2023).

### *Sexual Attractions and Gender*

Changes in sexual attraction may occur differently among genders. Some hypotheses focus on hormonal differences between men and women as a mediator of changes in sexual attractions or sexual interests (Larson et al., 2012; Stern et al., 2021). Others focus on the mediating role of socialized gender differences in influencing changes in sexual attraction (e.g., Diamond, 2016). Sexual fluidity is a large-scale construct that maps changes to various aspects of one's sexuality (i.e., sexual attraction, sexual behavior, and sexual orientation; Diamond, 2008). Notably, fluidity in this sense does not necessarily indicate changes in sexual attractions, as fluidity may be disproportionately influenced by shifts in sexual orientation identity. One's preferred partner or identity may shift, but the latent content of sexual attractions may remain stable. For example, a male may have a stable attraction to oral sex with another male despite their sexual orientation identity changing from gay to bisexual with time.

As reviewed by Walters et al. (2025), the study of changes in sexual attraction and gender has produced mixed results, with reports of women changing more (e.g., Diamond, 2008; Diamond et al., 2017; Katz-Wise, 2015; Katz-Wise et al., 2023), some reports of men changing more (e.g., Katz-Wise et al., 2016), and some reporting no effect of gender (e.g., Mock & Eibach, 2012). Despite mixed results, most studies suggest that women experience greater change in sexual attractions than men (Diamond, 2008; Diamond et al., 2017). However, there have been documented gender differences among atypical or paraphilic sexual attractions, which are predominantly expressed by men and may exhibit different patterns of change (e.g., see discussion about paraphilic attractions, interests, and fantasies in Harvey & Jeglic, 2020). Further, researchers typically measure gender-based sexual attractions using a binary of men/women. This is a limitation of existing research that might be developed by presenting

participants with more diverse gendered options, as was explored in Walters and Lalumière (2025)

### ***Sexual Attractions and Orientation***

Perhaps sexual attractions change differently as a function of sexual orientation (Diamond et al., 2017; Jones & Yarhouse, 2011; Katz-Wise et al., 2023; Ott et al., 2011). Kaestle (2019) hypothesized about the influence of heteronormativity; perhaps same-sex indicators (e.g., sexual attraction) vary because of a person's acceptance or rejection of heteronormative social expectations. Alternatively, different patterns of sexual attractions have been documented between "types" of sexual orientations, like between plurisexual (e.g., pansexual, bisexual) and monosexual (e.g., gay, heterosexual) orientations (e.g., Diamond et al., 2017; Lorenz, 2024). Plurisexual individuals are likely to perceive and report their sexual orientations as fluid, often balancing preferential sexual attractions to multiple gender targets (Matheson & Blair, 2023).

Perhaps the self-perception of how many genders one is attracted to could influence changes in sexual attractions. Katz-Wise et al. (2023) examined retrospective changes in gender-based sexual attractions and orientations among 4,087 youth in the United States. They asked participants about whether they had experienced a change in sexual attractions and orientation in the past and about their current sexual attractions. For every youth who experienced a change in sexual orientation, twice as many experienced a change in sexual attractions. Changes in sexual attraction were more common among plurisexual orientations and least common among heterosexual youth. This compares to other reports of bisexual individuals showing greater change in gender-based sexual attractions than heterosexual peers (Diamond et al., 2017).

### *Sexual Attractions and Age*

Changes in sexual attractions have been documented for people of various ages, with variations in how these changes function at different life stages (Kaestle, 2019). During young adulthood (e.g., 18–35 years), changes are typically more pronounced and are often studied in the context of sexual orientation development and change in gender-based attractions (e.g., Katz-Wise, 2015; Katz-Wise & Hyde, 2015). In middle-aged adulthood (e.g., 35–60 years), changes in sexual attractions are typically measured retrospectively and are intermixed with changes in fantasies, interests, romantic attractions, and sexual orientation (e.g., Kinnish et al., 2005). Evidence of change in middle-aged adults primarily comes from qualitative studies, where participants reflect on evolving sexual interests over time (e.g., Kirkman et al., 2015). Among senior adults (e.g., 60+ years), changes in sexual attractions have been documented as a function of chronophilic factors; senior women typically maintain age-matched attractions, while senior men show a preference for younger partners (Buunk et al., 2001; Kenrick & Keefe, 1992). These studies, however, intermix sexual attraction with sexual preference, desire, and interest. It is unclear how diverse sexual attractions, specifically, change for senior adults. Overall, sexual attractions likely change throughout all age-based life stages, perhaps for varying reasons. There is little research documenting such trajectories and much remains to be known about the extent of change in sexual attraction with age.

### **Current Study**

The primary goal of this study is to assess changes in sexual attractions over time using the SAI. This data can better inform current theories of sexual attraction, sexual fluidity, and human sexuality broadly. It may also inform future clinical interventions designed to support those who experience a change in their sexual attractions, or in interventions where sexual

attractions or interests are used to predict risk of sexual offence (i.e., Davis & Darjee, 2025). This study also investigates trajectories of change in sexual attractions and differences as a function of gender, sexual orientation, and age. Our first research question asks how much absolute change (and how many “changers”) in sexual attraction will occur over a year in a sample from the online public and from a panel of online participants in a recruitment database. We predict that changes in sexual attraction will be observed across all items. We further predict that greater absolute changes will be observed after one year than in the first six months following the baseline. Based on the results from Walters and Lalumière (2025), we also expect that the greatest absolute changes will be observed among attractions related to dominance/submissiveness. Finally, and based on Walters and Lalumière (2025), we predict that effect sizes of change ( $d_{wsc}$ ) will vary but generally be between .20 and .80, and Reliable Change Indices (RCIs) will indicate a change in approximately one-fifth of the sample (varying across items).

Our second research question asked if (and how many) discrete trajectories of change are observed within each item on the SAI. Although we do not have predictions about specific trajectories, we expect to observe a large ‘no change’ group. Our third research question asked what the differences are in absolute changes in sexual attraction between ages, genders, and sexual orientations. There has been limited research in comparing changes in sexual attractions across demographic groups, therefore our prediction for this research question is exploratory; we expect larger changes for young individuals, women, and non-heterosexual groups.

## **Method**

### **Participants**

We recruited 2,000 participants online in January 2024 using two separate recruitment strategies for a three-part online survey of sexual attractions. Participants were removed from analyses if they did not complete the informed consent questions ( $n = 5$ ) or failed at least one of the attention check questions embedded into all three parts of the survey ( $n = 48$ ). We excluded 33 participants who did not complete at least 80% of the SAI. At baseline (Time 1), 1,914 participants remained for analysis ( $M_{age} = 30.15$ ,  $SD_{age} = 9.14$ , range = 16 – 76), of whom 49% were men, 50% were assigned male at birth, 57% identified as heterosexual, and 39% were single. We retained 1,295 participants (68%;  $n_{Prolific} = 756$ ,  $n_{Online} = 539$ ) at Time 2, six months later ( $M_{age} = 30.90$ ,  $SD_{age} = 9.31$ , range = 16 to 77) and 1,027 participants (54%;  $n_{Prolific} = 539$ ,  $n_{Online} = 488$ ) at Time 3, one year later ( $M_{age} = 31.59$ ,  $SD_{age} = 9.52$ , range = 17 to 77). Details on participant demographic information, including the range of countries where participants were residing, can be found in Table 4.1.

## **Measures**

### ***Biographics***

Participants were asked to provide information about their gender and sex (using the Gender/Sex 3x3; Beischel et al., 2022), sexual orientation label, age, country of residence, and relationship status. Age was assessed using a visual analog scale (VAS) to give participants practice using the sliding scale before completing the SAI. Several of these variables are used in analyses (gender identity, sexual orientation, and age) while others are reported to describe the samples (i.e., country of residence, sex at birth, and relationship status).

### ***The Sexual Attraction Inventory (SAI)***

The SAI originally consisted of 40 items assessing a range of typical and atypical attractions. The SAI is intended to be used as an item-by-item inventory for evaluating sexual

attractions to diverse stimuli. In the study by Walters and Lalumière (2025), an exploratory factor analysis was conducted to evaluate whether the SAI performed as expected during drafting. This analysis resulted in participants' rating of their sexual attraction to women clustering with attraction to non-binary participants, but separately from men. For the present study, three items were added to explore further gender-based differences in sexual attractions: sexual attraction to masculinity, femininity, and androgyny. This left a total of 43 items for the present study. These 43 items were presented in three clusters: gender-based stimuli (eight items), age-based stimuli (eight items), and paraphilic stimuli (27 items).

Before viewing the items, participants were first asked to review a definition of sexual attraction to ensure they understood what was being rated (“anything that you feel attracted or pulled towards in a sexual way”). They were also given examples of how this differs from other constructs (i.e., sexual arousal, desire, fantasy). See Figure 4.1 for details on what participants reviewed. After indicating that they had reviewed the definition, participants began rating their sexual attraction to various stimuli.

When completing the SAI, participants rated their sexual attraction to gender-based stimuli, followed by the age-based, and then the paraphilic stimuli. Within each of these three clusters of stimuli, items were presented in a randomized order. For each item, participants were provided with a VAS for their answers (see Figure 4.1). Participants clicked and moved a 1-point slider on either their computer or smartphone along a 400-pixel scale with two polar anchors: 0 (labeled as “Not sexually attracted”) and 100 (labeled as “Extremely sexually attracted”). Numerical values were hidden from participants but recorded for analyses. In a sample of 670 students from the Walters and Lalumière (2025) study, the SAI demonstrated acceptable convergent validity (i.e., with items from the Kinsey scale) and face validity (i.e., with

participants rating it as acceptable, understandable, and clear). The test-retest reliability of the items across two weeks varied as a function of the base rate; items with ratings greater than 10/100 were reliable ( $r > .70$ ).

### **Procedure**

Participants used in our analyses ( $n = 1,914$ ) were recruited through two separate methods. A total of 998 participants were recruited through the online survey participant database, Prolific (i.e., “Prolific sample”). The remaining 916 participants (i.e., “Online sample”) were recruited through online sexuality-related groups (e.g., Centre for Sexuality), social media (e.g., X, Facebook, Reddit forums such as r/sex), online study recruitment flyers, and email listservs. The recruitment flyer included a QR code with detailed information about the study. For example, participants were informed that they would be asked questions that might be sensitive or uncomfortable. Participants were also reminded that they had the option to decline answering questions and could withdraw from the study at any time. To be included in the study, participants were asked to confirm that they were 16 years of age or older and understood English. They must also indicate that they were aware that the study was designed to be completed in three parts.

The sample size was estimated based on effect sizes reported by Walters and Lalumière (2025). This study used a similar methodology among a sample of university students. In a review by Walters and colleagues (2025), changes in sexual attractions were observed in multiple age groups without clear differences between younger adults and older ones. Therefore, the Walters and Lalumière (2025) study seemed to be comparable enough to use in a sample size estimation.

G\*Power was used to compute an estimated required sample size to detect an effect size of Cohen's  $d = .22$ , the smallest effect size of change from the SAI in Walters and Lalumière. Using an alpha level of .05 and a power value of .95, this estimate yielded a minimum sample size of 297. Multiplying this by an estimated attrition rate (40%) for each time point, 583 participants were needed to detect, at a minimum, a change. We decided to oversample up to 1,000 participants to improve the likelihood of greater base rates of paraphilic interests and to obtain a diverse sample of gender, sexual orientation, and age. We opted to recruit from two separate sources (i.e., Prolific and online word-of-mouth) to ensure adequate sampling at the end of the project for analysis and to compare any differences between recruitment strategies.

Each method of recruitment directed participants to click a link for a survey titled "Assessing Sexual Attractions Over Time" which was uploaded to SoSci in Winter 2024. Before each survey, participants confirmed their eligibility, reviewed the informed consent forms, and agreed to receive follow-up notifications via email for subsequent surveys. We collected and stored contact information separately from survey data within SoSci to maintain participant anonymity. Participants were then sent the first survey via email. The online survey took an average of 11 minutes per occasion ( $SD = 4$  minutes,  $Mdn = 9$  minutes) and was administered three times (i.e., at baseline, 6 months post-baseline, and 12 months post-baseline).

Each survey began with asking for biographic information, followed by a definition of sexual attraction, and then the SAI items. Interspersed within the SAI were two attention check questions (i.e., "Please select 'strongly agree'" and "Please indicate whether the following prompt is true or false: I was born on planet Earth"). Participants who correctly answered with "strongly agree" and "true", respectively, were retained for analyses. Participants also completed two measures not used in the present study: social desirability (Marlowe-Crowne Social

Desirability Scale – Short Form; Crowne & Marlowe, 1960) and psychological distress (Kessler-10 Scale; Kessler et al., 2002).

Participants from Prolific were compensated with \$2.25 (CAD) for each survey completed. Participants recruited from online or social media were entered into a separate draw for one of two \$100 gift cards for each survey they completed (up to three). Should participants complete all three surveys, they were entered into a fourth draw for a \$200 gift card.

### **Data Analysis Plan**

The analysis plan was pre-registered before the completion of data collection ([osf.io/cb2g8](https://osf.io/cb2g8)). For the first research question, mean scores from the SAI at baseline, 6 months, and 12 months are reported and reviewed. We reviewed mean differences between the two samples to guide decisions about combining samples for analyses (see Table 4.1 and Supplemental Materials; Figure S1). Given that there were more similarities among the two groups than differences and that both samples were derived from general internet users, we opted to combine them for analyses of change.

A modified Cohen's  $d$  formula was used to evaluate changes in sexual attractions using absolute standardized within-individual change from Time 1 to Time 3 as the numerator and the pooled standard deviation as the denominator (see Walters & Lalumière, 2025). A 95% confidence interval was calculated for each change index using 5,000 bootstrap samples. Reliable Change Indices (RCIs) were calculated to evaluate changes using a formula from Ley (1972). We used the test-retest (TRT) values of each item from the Walters and Lalumière study (2025) in the RCI formulae. For the three novel items (i.e., sexual attraction to masculinity, femininity, and androgyny), we substituted TRT values for internal consistency values of each item across the three assessments (i.e., Cronbach's alpha = .96, .93, and .91, respectively).

Changes in either direction (i.e., increases or decreases; that is, absolute change) were considered and evaluated across both methods.

For the second research question, group-based trajectory modeling was used to explore differences in trajectories of change across groups or “types” of change (Nagin, 2009; Nagin et al., 2024). Using data from participants who completed all three assessments (i.e., “completers”,  $n = 901$ ), group-based trajectory modelling was conducted using R (lcm library; see Proust-Lima et al., 2017). The script used for analyses was made publicly available via Open Science Framework ([osf.io/y96at/](https://osf.io/y96at/)). For each item on the SAI, up to five trajectories were tested. We assessed the fit of each iterative model by evaluating the decreasing trend in both the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) indices (Nagin & Odgers, 2010). The model with the lowest AIC/BIC value before the “elbow” in plotting these values was used to make decisions about how many trajectories best fit the data. The fit-criterion assessment plot (F-CAP) method was then used to verify trajectory enumeration decisions (Klijn et al., 2015).

Our third research question pertained to the influence of gender, sexual orientation, and age on changes in sexual attractions. We had initially planned to evaluate these potential differences in absolute change scores using mean-comparison statistics (i.e., *t*-tests). However, we opted to plot mean scores and their accompanying degree of precision (95% CI) visually separated by biographic group because it was more informative.

For gender, we had small samples of participants with various identities who self-reported wanting to be considered as part of a gender group outside the binary of cisgender men/women. As several of these identities had sizes fewer than 10, we combined them to include them in analyses and to generate novel research questions. This group consisted of self-identified

transgender individuals (transmen and transwomen), non-binary individuals, gender nonconforming individuals, and individuals with other identities (i.e., “TNBGNC+”).

Participants in our sample self-reported a total of 11 sexual orientation labels. Given that some of these groups had fewer than 10 participants and others shared overlapping qualities (e.g., some participants reported being both “mostly homosexual” and “questioning”), we combined some of those groups. To do this, mean scores were visualized for each possible pair of identities in their baseline ratings of sexual attraction to “people who appear as men” and “people who appear as women”. We combined orientation groups that did not appear to differ in these gender-based sexual attractions (e.g., a group consisting of bisexual, demisexual, pansexual, queer, and “other” was created and labelled “BPDQO”), resulting in seven groups for analyses (see Table 4.1).

Age as a continuous variable was plotted against an overall absolute mean change score. This score was an average of absolute change across all items on the SAI for each participant and was used as a proxy for general change in sexual attractions. A line of best fit was included to visualize the trend across ages.

## **Results**

### **Describing Participants’ Sexual Attractions**

Comparable to the results of the Walters and Lalumière study (2025), participants in the combined sample were most sexually attracted to “young adults”, “femininity”, “people who appear to be women”, and “having sex with an adult woman”. There were several similarities in the stimuli that participants were most sexually attracted to between the two samples. The Prolific sample was most sexually attracted to “people who appear to be women”, “femininity”, “adults”, “young adults”, and “having sex with an adult woman”. The Online sample was most

sexually attracted to “people who appear to be women”, “femininity”, “young adults”, “being controlled or dominated by someone”, and “having sex with an adult woman”. See Table 4.2 for the mean scores of all items on the SAI across each time point.

As detailed in Table 4.3, both men and women were most sexually attracted to “young adults”, “people who appear as the [other binary gender]” (in reference to men/women), and “having sex with a member of [the other binary gender]”. Men in the sample also had a high mean sexual attraction rating of “femininity”, a newly added item to the SAI. The TNBGNC+ participants were most sexually attracted to “having sex with an adult woman”, “young adults”, and “people who appear to be a gender outside of the binary of men/women”. Upon reviewing the first two items of the SAI (i.e., “people who appear to be men [women]”), 930 participants reported ratings above 10/100 for both at baseline. Of these 930 participants reporting sexual attraction to both men and women, 630 were women, 222 men, and 78 were TNBGNC+. There were 23 participants who reported less than 10/100 sexual attraction on both gender-based items.

Across age bands, participants were generally teleiophilic and most sexually attracted to “people who appear to be women”, “femininity”, and “having sex with an adult woman” (see Table 4.4). However, senior adults were, on average, more sexually attracted to “adults” than to other senior adults. With a few exceptions, mean scores for each item decreased as age increased. These exceptions included age-based attractions (i.e., teleiophilic reference points changed), “being spanked, beaten, or whipped by someone” (increase among young adults), “being urinated on by someone” (marginal increase with age), “being defecated on by someone” (marginal increase with age), “touching or rubbing a stranger who is not expecting it” (generally consistent), and “watching an unsuspecting stranger who is not expecting it” (increase with age).

### **Evaluating Changes in Sexual Attractions Across Time**

As predicted, some degree of change over time (between Time 1 and 2 and between Time 1 and 3) was observed on average across all items (see Table 4.5 and Figure 4.2). Changes in sexual attractions between both time intervals (Time 1 – 2 and 1 – 3) were comparable: Except for three items (“adults”, “urinating on someone”, and “defecating on someone”), the 95% confidence intervals for the effect sizes for Time 1 – 2 and 1 – 3 overlapped. The items with the largest effect sizes of change across Time 1 – 2 were “controlling or dominating someone,” “tying or handcuffing someone,” and “adults.” From Time 1 – 3, they were “tying or handcuffing someone”, “adults”, and “spanking, beating, or whipping someone”. Across both timeframes, effect sizes varied with a range of .11 (“toddlers”) to .59 (“adults”). Using RCIs as a metric of individual change, the items with the greatest number of “changers” were “spanking, beating, or whipping someone”, “people who appear to be women”, and “people who appear to be a gender outside the binary of men/women”. The fewest number of “changers” was observed for “children”, “toddlers”, and “babies. In general, the greatest change (at both the group- and individual-levels) was observed for items related to dominance/submission, and the least was for pedophilic items (consistently rated low). Six participants did not change by more than 10/100 units on *any* stimulus assessed by the SAI from Time 1 to Time 2, five of whom also did not change from Time 1 to Time 3.

### **Trajectories of Change in Sexual Attractions**

Various patterns of change (or lack thereof) were observed when fitting participants’ scores on the SAI into group-based trajectories (see Figures 4.4 and 4.5). For most of the items on the SAI, participant scores fit into two trajectories (18/43 items on the SAI). There were 16 items with three distinct trajectories, seven with four trajectories, and two with a single trajectory. We divided the figures based on which trajectories indicated a change above 10/100

(Figure 4.4) and those that generally showed no distinct change groups (Figure 4.3). There were 13 items from the SAI with at least one distinct “changer” group, and 30 that had generally flat trajectories over time. Typically, most items had a “no change, no attraction” group illustrated by the flat lines at the bottom of the y-axis. Many (30/43) models also contained a “no change, high attraction” group, illustrated by a flat line above the 50/100 mark on the y-axis.

Among most of the gender-based items of the SAI (7/8), there was a “no change, somewhat attracted” group, except for “masculinity,” which only had two trajectories. Among the age-based sexual attractions, items assessing ages at or above 16 all had two trajectories (a “no change, no/low attraction” group and a “no change, medium/high attraction” group). The items assessing sexual attraction to younger adolescents, children, toddlers, and babies all had four trajectories; at least one of which indicated a “low-to-high changers” group with relatively small sample sizes. Results varied for paraphilic items in terms of the number of trajectories and typologies of change.

### **Biographic Influences on Changes in Sexual Attractions**

Figure 4.5 shows a comparison of changes in SAI ratings over time by gender groups (i.e., men, women, and a group composed of transgender, non-binary, gender-non-conforming, and other gender expressions who indicated that they thought their data should be separated from binary gender groups [TNBGNC+]). Within a range of 0 to 100, the average absolute change across all items on the SAI over one year was 9.49 units ( $SD = 5.02$ ,  $Mdn = 8.58$ ) for men, 9.50 units ( $SD = 4.49$ ,  $Mdn = 9.10$ ) for women, and 11.59 units ( $SD = 5.21$ ,  $Mdn = 10.84$ ) for the TNBGNG+ group. Greater change across SAI items and across time comparisons was generally observed in the TNBGNG+ group; however, the relatively small size of this group resulted in considerable variability and large 95% confidence intervals. Between Time 1 and 2, women had

greater change scores (without overlap in confidence intervals) for eight items on the SAI (item #s 1, 2, 4, 5, 9, 24, 29, 30; see Figure 4.5) while men had greater change scores on nine (item #s 10, 11, 17, 22, 31, 38, 39, 40, 42). Results were comparable for the Time 1 to 3 comparison, with women changing more on eight items (item #s 1, 2, 4, 5, 9, 29, 30, 37) and men on seven (item #s 10, 11, 17, 22, 31, 39, 40).

Figure 4.6 depicts a plot of average absolute change (across all items on the SAI) against participant age. Results were similar across both time comparisons; younger participants experienced greater average (absolute) change than older participants. While the slopes of each plot were relatively shallow across the range of data, the 95% confidence interval of the scores among senior adults was outside the range of those below the age of 30. The line of best fit for all ages was lower than 15/100 for all participants, and lower than 10/100 for participants aged 25 and above. We interpret this to mean that any change was minimal.

Figure 4.7 shows a plot of changes in SAI ratings over time by sexual orientation groups. To compare the overall absolute mean change across all items, the three orientations most reported by participants and within the research were compared (i.e., heterosexual, homosexual, and bisexual). The average absolute change across all items on the SAI over one year was 8.71 units ( $SD = 4.46$ ,  $Mdn = 8.05$ ) for heterosexual participants, 10.67 units ( $SD = 7.97$ ,  $Mdn = 8.37$ ) for homosexual participants, and 10.72 units ( $SD = 4.37$ ,  $Mdn = 10.40$ ) for bisexual participants. Heterosexual participants had the most absolute change, over one year, in their sexual attraction to “tying or handcuffing someone”, “controlling or dominating someone”, and “adults”. Homosexual participants had the most absolute change, over one year, in their sexual attraction to “tying or handcuffing someone”, “people who appear to be a gender outside of the binary of men/women”, and “spanking, beating, or whipping someone”. Bisexual participants had the most

absolute change, over one year, on “tying or handcuffing someone”, “spanking, beating, or whipping someone”, and “being spanked, beaten, or whipped by someone”. Despite a small group size and large confidence intervals, the mostly homosexual/questioning group of participants typically had the greatest average change scores on most items across both time comparisons. Asexual participants typically had the lowest average change scores (but not always at 0). There was variability across items, but the BPDQO participants typically had greater average change scores than heterosexual or homosexual participants.

### **Discussion**

The goals of this study were to measure changes in sexual attractions to diverse stimuli (both the quantity of change and the number of “changers”), explore trajectories of change, and compare change across biographic groups. Results indicate that stability is common, but when there is change, sexual attractions change differently based on the target/act assessed and the gender (similar overall change for men and women but across different items and somewhat greater change among gender-diverse participants), age (some differences between age groups but overall comparable results with age), and sexual orientation (greater change among mostly homosexual/questioning and bisexual participants) of the rater. The interpretation of findings both challenges and supports existing hypotheses of changes in sexual attractions in ways that warrant further discussion.

#### **On Changes in Sexual Attractions**

The present study is most comparable in methodology to the SAI development and psychometric evaluation study (Walters & Lalumière, 2025). Some of the key findings from that study were that sexual attractions to BDSM- and gender-related stimuli had both the greatest effect sizes of absolute change and the most changers compared to other items on the SAI.

Notably, the effect sizes in the present study were generally smaller than those reported by Walters and Lalumière. While we replicated the finding pertaining to BDSM-related stimuli, changes in sexual attraction to gender-related stimuli varied considerably. Additionally, the stimuli with the lowest measured change in sexual attraction were different between the results of the present study (i.e., toddlers, children) and of the Walters and Lalumière study (i.e., “having your skin cut”, “pretending to rape someone”). However, they are alike in that they are among the lowest-rated stimuli, all of which have mean scores below 10/100 and may not be reliable.

A key difference between the present study and Walters and Lalumière (2025) is that we included group-based trajectory modelling to explore “types” or clusters of change patterns among the stimuli assessed by the SAI over a full year. Of the 43 models (one for each SAI item), 30 did not have a clearly defined change trajectory. This was a novel finding; however, it is consistent with a general interpretation of our overall results: a change in sexual attraction to at least one stimulus is common, but stability is more prevalent.

Change trajectories differed between normophilic and paraphilic stimuli; there were no normophilic items among the panels with a clearly defined change trajectory. However, there was a mix of normophilic and paraphilic stimuli among the “no change” panels. Across all stimuli, when changes are aggregated to find common trajectories, “no change” is still more common than a distinct group of “changers”.

Interestingly, pedophilic and hebephilic sexual attraction trajectories all contained a clearly defined, small group of changers. At baseline, 4.7% of the sample reported an attraction to one or more of the pedohebephilic stimuli above 10/100. This degree of pedohebephilic attraction is within Seto’s (2018) pedophilia prevalence rate estimated range of 1 – 5% among

men and less than 1% among women<sup>2</sup>. The average size of the pedophilic/hebephilic change groups was 11, representing approximately 1% of the overall sample used in trajectory modelling ( $n = 901$ ). We estimate that 20-25% of pedohebephilic attracted participants in our sample experienced a change in their sexual attractions to either “younger adolescents”, “children”, “toddlers”, or “babies” over a year. In the combined sample and among all items included in the SAI, reliable change was experienced by 1-20% of participants.

These findings related to pedohebephilic attractions generate interesting research questions for researchers and may have future clinical extensions. For example, do these results replicate and differ across those who have documented histories of sexual contact with children/youth and those who do not (e.g., offenders versus non-offenders)? Further, these are valuable findings for those interested in preventing future harm or offences perpetrated toward children/youth. Sexual interest in children is a key risk factor used by researchers and clinicians to understand child sexual offending (as per Davis & Darjee, 2025). If these interests change similarly to sexual attractions, so too would the predictive validity of using it assess risk of offence. This knowledge can inform future interventions and risk assessments within this population.

Using Abé’s (2025) theoretical framework, we interpret that participants in the present study were more sexually attracted to and changed the most among the normophilic stimuli (see Brown et al., 2023 for commentary on using the term “normophilic”) that they are more likely to

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<sup>2</sup> Prevalence of pedohebephilic attraction in our sample is likely inflated by our recruitment strategy, which included targeted sampling from online sexuality groups, one of which was a group associated with attraction to children (i.e., B4U-ACT)

have encountered naturally (e.g., greater learned experience) and have more positive associations with (contrary to paraphilic stimuli which are more likely to be associated with social stigma and distress; Moser & Kleinplatz, 2020). When evaluating their sexual attraction, participants would likely have a greater wealth of sexual “priors” to draw upon when appraising stimuli like “people who appear to be men/women” or “adults” than when evaluating more paraphilic ones. These positive evaluations promote greater desire, motivation, and arousal, which strengthen sexual priors and change future appraisals of sexual attraction gradually.

However, there were no normophilic stimuli among the panels of change trajectories with a clearly defined change group. These trajectory models produce visuals and trajectory counts based on well-defined differences; the modeling favors sharp or steep changes over time when defining groups (Nagin, 2009). In a general public sample, natural encounters with paraphilic stimuli are more likely than normophilic ones to contain an element of novelty, surprise, shock, or anxiety (e.g., Brotto et al., 2014; Money et al., 1993). These conditions are likely to produce more marked or sharp changes in paraphilic stimuli if participants had engaged in paraphilic behaviors or were exposed to paraphilic sexual content (e.g., pornography with paraphilic content) between assessments. Therefore, changes in sexual attraction to paraphilic stimuli would likely consist of small groups of steep changers, as was observed in the trajectory modelling. This pattern of results also fits within Abé’s framework; a new and/or sudden exposure to an exciting (or anxiety-producing) stimulus without many sexual priors would produce more chaotic or marked change over time.

Using Abé’s (2025) framework, the increased interest in, engagement with, and public discussion/research of BDSM may explain why these stimuli were rated high in sexual attraction and changed the most in our sample (De Neef et al., 2019; Larva & Rantala, 2024; Westlake &

Mahan, 2025). The sexual priors framework explains the general trend of our findings (i.e., more typical stimuli are rated higher and change more than paraphilic ones, such as scat or children, which were consistently rated low and are likely to have the fewest and/or weakest sexual priors). It would be interesting for future researchers to use Abé's model to predict prospective changes in sexual attractions based on priors and changes in these priors over time.

### **On Changes in Sexual Attractions and Gender**

In our sample, differences were observed between men, women, and TNBGNC+ participants across multiple stimuli assessed. The amount of total absolute change over one year was nearly the same between men and women, and slightly higher for TNBGNC+ participants. Women had greater absolute change among items that are broadly normophilic (e.g., “masculinity” / “femininity”, “having sex with an adult man [woman]”, “young adults”). Men changed more on items that are paraphilic (e.g., “younger adolescents”, “verbally humiliating someone”, “touching or rubbing a stranger who is not expecting it”, “pretending to rape someone”). The TNBGNC+ participants had the greatest degree of change across most items; however, further research is needed with larger samples to provide a more precise analysis.

Across diverse stimuli and over one year, men and women experienced a nearly identical amount of absolute change in their sexual attractions. However, men and women differed in which stimuli they experienced a change in sexual attraction toward. These results provide some evidence in favour of Diamond's hypotheses that men and women experience different types of sexual fluidity (see Diamond et al., 2017; Diamond et al., 2020). Diamond's analysis of how gender influences patterns of change in sexual attractions is limited in that it only measures change in the context of people's attraction to men/women. However, our results highlight varied gender patterns among non-gender targets of sexual attraction as well. Collectively, these lines of

research support the hypothesis that gender influences changes in sexual attractions over time in stimulus-specific ways.

### **On Changes in Sexual Attractions and Sexual Orientation**

Diamond's research on sexual fluidity also focuses on the influence of bisexuality (e.g., Diamond, 2016; Diamond et al., 2017; Diamond et al., 2020). Our results also provide further insight into this line of research. In our sample, greater change was typically (but not exclusively) observed among homosexual and nonexclusive or plurisexual orientations. Participants who self-identified as asexual or heterosexual typically had the lowest absolute change over both time comparisons. These results are similar to Diamond's work, suggesting that nonexclusive sexual orientations are more "open" or "flexible" in the fluidity of gender-based sexual attractions (Diamond et al., 2017; Manley et al., 2015). In a review of her research and other large-scale sexual orientation studies, Diamond hypothesized that the traditional view of characterizing bisexual women as the most sexually fluid obfuscates the complexity of how sexual fluidity is independently influenced by gender and sexual orientation. Our results extend this work by independently reporting patterns of change by gender and sexual orientation beyond gender-based sexual attractions. And yet, we make a similar deduction about sexual orientation as Diamond; nonexclusive sexual orientations showed greater absolute change in sexual attractions than heterosexual participants.

However, we also report that homosexual participants (an exclusive sexual orientation) typically showed greater absolute change in sexual attractions than heterosexual participants. These results are comparable to Katz-Wise's (2015) findings that, in their sample of 199 US sexual minority young adults, sexually fluid women typically identified as "mostly heterosexual/straight, bisexual, completely homosexual/lesbian, and queer" while sexually fluid

men typically identified as “completely homosexual/gay”. Of course, Katz-Wise’s participants were all sexual minorities; however, as discussed in her article, it is interesting that “completely homosexual” was a common label used by sexually fluid men and women. Participants who were sexually fluid in their (gender-based) sexual attractions were more likely to report same-gender attractions compared to non-fluid participants. Perhaps *any* orientation that encompasses a same-gender attraction is the common factor in explaining our, Diamond’s, and Katz-Wise’s results.

Lastly, in discussing sexual orientation and changes in sexual attraction, it was interesting that participants who self-identified as asexual sometimes experienced a change in their sexual attractions. Indeed, among the 16 asexual participants, 12 reported *some* sexual attraction above 10/100 to at least one stimulus from the SAI at baseline. Although fewer than 10 asexual participants remained at the end of the study, two-thirds of them experienced a change greater than 10 units in at least one sexual attraction over a year. In their review of the classification of asexuality within psychopathological and sexuality frameworks, Brotto and Yule (2017) acknowledge the growing evidence of heterogeneity in sexual attraction among people who report an asexual identity. New terms have been used in cultures to describe asexual people who experience attraction to certain stimuli or under specific conditions (i.e., “gray-asexual”). They also discuss the paucity of research on sexual fluidity with asexual participants, limiting the validity of the assumption that asexual people experience change in sexual attractions. Our findings provide limited but interesting evidence that participants who self-identified as asexual were more likely than not to report attraction to something, and that was likely to change to some degree with time. This contrasts with the traditional view that asexual people are a homogenous

group who experience no sexual attraction consistently over time (i.e., the definition used initially by Storms, 1980, or Bogaert, 2004).

### **On Changes in Sexual Attractions and Age**

At baseline, there were several differences in sexual attractions between age bands. Where most age groups were teleiophilic, senior adults were more sexually attracted to a slightly younger-than-themselves group, adults. Several paraphilic attractions (e.g., “being urinated on by someone”, “being defecated on by someone”) showed a slight increase in mean scores with age. We also computed an overall mean absolute change score and plotted this against participants’ age. There was a small decrease with age. This finding has two key implications for the study of sexual attraction and aging.

First, our results contrast with the traditional view that senior adults are “post-sexual”, a finding that may also be reflective of the paucity of data on sexuality and aging (Bouman & Kleinplatz, 2015). Although our sample included only a few senior adults, they demonstrated slightly lower overall absolute change compared to all other age groups. Second, our findings add more nuance to current knowledge on the changes in sexual attractions and senior adults, which comes primarily from the finding that senior women typically maintain age-matched sexual preferences, while senior men show a preference for younger partners (Buunk et al., 2001; Kenrick & Keefe, 1992). We were unable to conduct a robust analysis of age and gender interaction effects, given the small sample size of senior adults. However, in our study, women typically experienced the greatest absolute change among normophilic attractions, while men changed more among paraphilic attractions. Perhaps part of the age-related difference, where women typically maintain age-matched partners (i.e., normophilic) while men prefer younger (i.e., potentially paraphilic), can be explained by differences between genders in general. It

would be interesting to replicate our findings with a larger sample of senior adults to provide a more robust analysis of chronophilic sexual attractions in this demographic.

### **On Recruitment**

We recruited from two independent samples and found relatively comparable results patterns between them. Both samples completed the study online, but they had varied geographic distributions and received different forms of compensation for their participation. At Time 2, more participants were retained from the Prolific sample (75%) than the Online sample (59%); however, attrition rates evened out at Time (54% retained from the Prolific sample, 53% from the Online sample). Otherwise, the samples were biographically and methodologically similar, and participants made similar ratings of sexual attractions at baseline. We interpret this to mean that researchers might choose either method of recruitment to obtain comparable results to our own over a one-year period (e.g., in terms of funding required, access to online spaces for recruitment, and expected attrition rates over a year). However, it would be interesting for future researchers to explore further the difference in attrition rates between the Prolific and Online samples over a six-month period.

A notable difference was that the Online sample typically exhibited a slightly greater absolute change in sexual attraction compared to the Prolific sample. This is likely an artefact of the sample strategy used for the Online sample to target groups defined by their interest in some aspect of sexuality (i.e., r/Sex or r/Pansexual on Reddit, Centre for Sexuality, B4U-ACT). It would be interesting to evaluate why participants recruited from sexuality-themed groups might experience greater change in certain sexual attractions (e.g., “having someone verbally humiliate you” as per the results of the present study) than those from non-sexuality-based online spaces (i.e., Prolific). Perhaps Abé’s (2025) model of sexual priors might explain this difference and

could be used in future studies. Participants from sexuality-based online groups might have a different organization and wealth of sexual priors than those from the general online public.

### **Limitations**

Our findings are best interpreted within the context of their limitations. Three such limitations are discussed in the Walters and Lalumière study (2025) and certainly apply to this study as well: (1) we still had small samples of some biographic groups that limit generalizability, (2) we focus exclusively on absolute change in scores where differences between “increasers” and “decreasers” could exist, and (3) the number and scope of items included limits the SAI and deductions made about sexual attraction generally.

Despite multi-sample recruitment, several groups used in the analyses remained small (e.g., senior adults, transgender participants, pansexual participants). These groups often exhibited greater variance in sexual attraction scores than those with 100 or more participants, which obfuscated group-based comparisons due to the large 95% confidence intervals generated by the mean scores of small groups (e.g., see Figure 4.7). We still included groups with sample sizes above 10 (or combined groups where relevant) to generate novel research questions, and we encourage future researchers to take more targeted approaches to recruitment based on their hypotheses.

While our results are limited in that we only focus on absolute change, a further limitation of the current study is that we only examined two *types* of change: changes in absolute mean sexual attraction scores and reliable within-person changes in scores over time. We measured attractions three times over one year and used the difference between scores to define change. However, our results may be capturing *multiple* types of sexual fluidity (see Diamond et al., 2020). As discussed, Diamond et al. have described at least four distinct “types” of sexual

fluidity: “(1) fluidity as overall erotic responsiveness to one’s less-preferred gender, (2) fluidity as situational variability in erotic responsiveness to one’s less-preferred gender, (3) fluidity as discrepancy between the gender patterning of sexual attractions and the gender patterning of sexual partnering, and (4) fluidity as instability in day-to-day attractions over time.” We did not directly assess specific types, which means our results could reflect multiple types and potential interaction effects among them. Future research should include a multi-method approach (e.g., compare self-report to psychophysiological measures and evaluate their effectiveness in mapping out discrete “types” of fluidity) when comparing these types of sexual fluidity among sexual attractions to diverse stimuli within and between participants.

Thirdly, we found that men and women changed most on different types of sexual attractions (e.g., paraphilic and normophilic items, respectively). This finding highlights that measuring change is influenced by the stimuli to which participants are presented. Therefore, while we took a more expansive approach to measure sexual attraction to 43 stimuli, we remain limited in our conclusions about change because of stimuli not included in the SAI. It would be valuable for future researchers to expand the SAI with novel items and test its psychometric properties before using the SAI to make inferences about changes in sexual attractions.

## **Conclusion**

This study used the SAI to measure changes in sexual attractions in two international online samples over one year. The two samples were quite similar biographically; however, the sample recruited from the general online community reported greater mean sexual attractions than the Prolific sample. We report mean changes, individual changes, and trajectories of change in sexual attraction to 43 stimuli. Further to this, we explored three biographic influences on changes in sexual attraction: gender, sexual orientation, and age. We report differences and likely

influences of all three. Notably, we found that women changed more on normophilic attractions and men on paraphilic attractions. We also report differences between nonexclusive or plurisexual identities and heterosexuality. We found a slight decrease in the overall change across all 43 items with participant age. We make several recommendations for future researchers studying changes in sexual attractions: evaluate multiple types of change (i.e., differences between increasers and decreases, but also different ways to conceptualize change, see Diamond et al., 2020), compare changes in sexual attractions to other biographic influences (e.g., hormones, life events) and sexual behaviours, use the SAI with more targeted sampling strategies, and finally, add and psychometrically evaluate novel stimuli to the SAI.

## References

- Abé, C. (2025). The concept of innate sexual priors in the brain: A theory on why we are attracted to what we are attracted to. *Sexuality & Culture, 29*, 636-666.  
<https://doi.org/10.1007/s12119-024-10290-4>
- Beischel, W. J., Schudson, Z. C., Hoskin, R. A., & van Anders, S. M. (2022). The gender/sex 3×3: Measuring and categorizing gender/sex beyond binaries. *Psychology of Sexual Orientation and Gender Diversity, 10*, 355-372. <https://doi.org/10.1037/sgd0000558>
- Bogaert, A. F. (2004). Asexuality: Prevalence and associated factors in a national probability sample. *Journal of Sex Research, 41*, 279-287.  
<https://doi.org/10.1080/00224490409552235>
- Bouman, W. P., & Kleinplatz, P. J. (2015). Moving towards understanding greater diversity and fluidity of sexual expression of older people. *Sexual and Relationship Therapy, 30*, 1-3.  
<https://doi.org/10.1080/14681994.2015.990192>
- Brotto, L., Klein, C., & Zucker, K. J. (2014). Sexual Dysfunctions and Paraphilic Disorders. In *Adult Psychopathology and Diagnosis* (pp. 547-601).
- Brotto, L. A., & Yule, M. (2017). Asexuality: Sexual orientation, paraphilia, sexual dysfunction, or none of the above? *Archives of Sexual Behaviour, 46*, 619-627.  
<https://doi.org/10.1007/s10508-016-0802-7>
- Brown, A., Barker, E. D., & Rahman, Q. (2023). Psychological and developmental correlates of paraphilic and normophilic sexual interests. *Sexual Abuse, 35*, 428-464.  
<https://doi.org/10.1177/10790632221120013>

- Buunk, B. P., Dijkstra, P., Kenrick, D. T., & Warntjes, A. (2001). Age preferences for mates as related to gender, own age, and involvement level. *Evolution and Human Behavior*, 22, 241-250. [https://doi.org/10.1016/S1090-5138\(01\)00065-4](https://doi.org/10.1016/S1090-5138(01)00065-4)
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, 24, 349. <https://doi.org/10.1037/h0047358>
- Davis, M. R., & Darjee, R. (2025). Clinical Versus Criminal Pedophilia: An Extended Review of Theory, Assessment, Diagnosis, and Intervention. *Best Practices in Sexual Offender Assessment and Management*, 369-492. [https://doi-org/10.1007/978-3-031-83135-5\\_13](https://doi-org/10.1007/978-3-031-83135-5_13)
- De Neef, N., Coppens, V., Huys, W., & Morrens, M. (2019). Bondage-discipline, dominance-submission and sadomasochism (BDSM) from an integrative biopsychosocial perspective: A systematic review. *Sexual Medicine*, 7, 129-144. <https://doi.org/10.1016/j.esxm.2019.02.002>
- Diamond, L. M. (2000). Sexual identity, attractions, and behavior among young sexual-minority women over a 2-year period. *Developmental Psychology*, 36, 241-250. <https://doi.org/10.1037/0012-1649.36.2.241>
- Diamond, L. M. (2008). *Sexual fluidity: Understanding women's love and desire*. Harvard University Press.
- Diamond, L. M. (2016). Sexual fluidity in male and females. *Current Sexual Health Reports*, 8, 249-256. <https://doi.org/10.1007/s11930-016-0092-z>
- Diamond, L. M., Alley, J., Dickenson, J., & Blair, K. L. (2020). Who counts as sexually fluid? Comparing four different types of sexual fluidity in women. *Archives of Sexual Behaviour*, 49, 2389-2403. <https://doi.org/10.1007/s10508-019-01565-1>

- Diamond, L. M., Dickenson, J. A., & Blair, K. L. (2017). Stability of sexual attractions across different timescales: The roles of bisexuality and gender. *Archives of Sexual Behaviour*, 46, 193-204. <https://doi.org/10.1007/s10508-016-0860-x>
- Dickson, N., van Roode, T., Cameron, C., & Paul, C. (2013). Stability and change in same-sex attraction, experience, and identity by sex and age in a New Zealand birth cohort. *Archives of Sexual Behaviour*, 42, 753-763. <https://doi.org/10.1007/s10508-012-0063-z>
- Harvey, T. A., & Jeglic, E. L. (2020). Attenuation of deviant sexual fantasy across the lifespan in United States adult males. *Psychiatry, Psychology and Law*, 27, 246-264. <https://doi.org/10.1080/13218719.2020.1719376>
- Jones, S. L., & Yarhouse, M. A. (2011). A longitudinal study of attempted religiously mediated sexual orientation change. *Journal of Sex & Marital Therapy*, 37, 404-427. <https://doi.org/10.1080/0092623X.2011.607052>
- Kaestle, C. E. (2019). Sexual orientation trajectories based on sexual attractions, partners, and identity: A longitudinal investigation from adolescence through young adulthood using a US representative sample. *Journal of Sex Research*, 56, 811-826. <https://doi.org/10.1080/00224499.2019.1577351>
- Katz-Wise, S. L. (2015). Sexual fluidity in young adult women and men: Associations with sexual orientation and sexual identity development. *Psychology & Sexuality*, 6, 189-208. <https://doi.org/10.1080/19419899.2013.876445>
- Katz-Wise, S. L., & Hyde, J. S. (2015). Sexual fluidity and related attitudes and beliefs among young adults with a same-gender orientation. *Archives of Sexual Behaviour*, 44, 1459-1470. <https://doi.org/10.1007/s10508-014-0420-1>

- Katz-Wise, S. L., Ranker, L. R., Gordon, A. R., Xuan, Z., & Nelson, K. (2023). Sociodemographic patterns in retrospective sexual orientation identity and attraction change in the sexual orientation fluidity in youth study. *Journal of Adolescent Health, 72*, 437-443. <https://doi.org/10.1016/j.jadohealth.2022.10.015>
- Katz-Wise, S. L., Reisner, S. L., Hughto, J. W., & St. Amand, C. (2016). Differences in sexual orientation diversity and sexual fluidity in attractions among gender minority adults in Massachusetts. *Journal of Sex Research, 53*, 74-84. <https://doi.org/10.1080/00224499.2014.1003028>
- Katz-Wise, S. L., & Todd, K. P. (2022). The current state of sexual fluidity research. *Current Opinion in Psychology, 48*, 101497. <https://doi.org/10.1016/j.copsyc.2022.101497>
- Kenrick, D. T., & Keefe, R. C. (1992). Age preferences in mates reflect sex differences in human reproductive strategies. *Behavioral and Brain Sciences, 15*, 75-91. <https://doi.org/10.1017/S0140525X00067595>
- Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. L., Walters, E. E., & Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*, 959-976. <https://doi.org/10.1017/S0033291702006074>
- Kinnish, K. K., Strassberg, D. S., & Turner, C. W. (2005). Sex differences in the flexibility of sexual orientation: A multidimensional retrospective assessment. *Archives of Sexual Behaviour, 34*, 173-183. <https://doi.org/10.1007/s10508-005-1795-9>
- Kirkman, L., Dickson-Swift, V., & Fox, C. (2015). Midlife relationship diversity, sexual fluidity, wellbeing and sexual health from a rural perspective. *Rural Society, 24*, 266-281. <https://doi.org/10.1080/10371656.2015.1099272>

- Klijn, S. L., Weijenberg, M. P., Lemmens, P., van den Brandt, P. A., & Lima Passos, V. (2017). Introducing the fit-criteria assessment plot: A visualisation tool to assist class enumeration in group-based trajectory modelling. *Statistical Methods in Medical Research*, 26, 2424-2436. <https://doi.org/10.1177/0962280215598665>
- Larson, C. M., Pillsworth, E. G., & Haselton, M. G. (2012). Ovulatory shifts in women's attractions to primary partners and other men: Further evidence of the importance of primary partner sexual attractiveness. *PLOS One*, 7, e44456. <https://doi.org/10.1371/journal.pone.0044456>
- Larva, M. A., & Rantala, M. J. (2024). An evolutionary psychological approach toward BDSM interest and behavior. *Archives of Sexual Behaviour*, 53, 2253-2267. <https://doi.org/10.1007/s10508-024-02881-x>
- Ley, P. (1972). *Quantitative aspects of psychological assessment*. London: Gerald Duckworth.
- Lorenz, T. K. (2024). Sex/gender differences in how plurisexual attractions contribute to young adults' thoughts and feelings about their sexual selves. *Journal of Gay & Lesbian Mental Health*, 1-18. <https://doi.org/10.1080/19359705.2024.2386938>
- Manley, M. H., Diamond, L. M., & van Anders, S. M. (2015). Polyamory, monoamory, and sexual fluidity: a longitudinal study of identity and sexual trajectories. *Psychology of Sexual Orientation and Gender Diversity*, 2, 168. <https://doi.org/10.1037/sgd0000098>
- Matheson, L. P., & Blair, K. L. (2023). From continua to kaleidoscopes: How plurisexuality challenges traditional conceptualizations of sexual orientation. *Canadian Journal of Human Sexuality*, 32, 151-163. <https://doi.org/10.3138/cjhs.2023-0022>

- McClintock, M. K., & Herdt, G. (1996). Rethinking puberty: The development of sexual attraction. *Current Directions in Psychological Science*, 5, 178-183.  
<https://doi.org/10.1111/1467-8721.ep11512422>
- Mock, S. E., & Eibach, R. P. (2012). Stability and change in sexual orientation identity over a 10-year period in adulthood. *Archives of Sexual Behaviour*, 41, 641-648.  
<https://doi.org/10.1007/s10508-011-9761-1>
- Money, J., & Pranzarone, G. F. (1993). Development of paraphilia in childhood and adolescence. *Child and Adolescent Psychiatric Clinics*, 2, 463-475. [https://doi.org/10.1016/S1056-4993\(18\)30552-2](https://doi.org/10.1016/S1056-4993(18)30552-2)
- Moser, C., & Kleinplatz, P. J. (2020). Conceptualization, history, and future of the paraphilias. *Annual Review of Clinical Psychology*, 16, 379-399. <https://doi.org/10.1146/annurev-clinpsy-050718-095548>
- Nagin, D. S. (2009). Group-based trajectory modeling: an overview. In *Handbook of Quantitative Criminology* (pp. 53-67). [https://doi.org/10.1007/978-0-387-77650-7\\_4](https://doi.org/10.1007/978-0-387-77650-7_4)
- Nagin, D. S., Jones, B. L., & Elmer, J. (2024). Recent advances in group-based trajectory modeling for clinical research. *Annual Review of Clinical Psychology*, 20, 285-305.  
<https://doi.org/10.1146/annurev-clinpsy-081122-012416>
- Nagin, D. S., & Odgers, C. L. (2010). Group-based trajectory modeling in clinical research. *Annual Review of Clinical Psychology*, 6, 109-138.  
<https://doi.org/10.1146/annurev.clinpsy.121208.131413>
- Ott, M. Q., Corliss, H. L., Wypij, D., Rosario, M., & Austin, S. B. (2011). Stability and change in self-reported sexual orientation identity in young people: Application of mobility

- metrics. *Archives of Sexual Behaviour*, 40, 519-532. <https://doi.org/10.1007/s10508-010-9691-3>
- Proust-Lima, C., Philipps, V., & Liqueur, B. (2017). Estimation of extended mixed models using latent classes and latent processes: the R package lamm. *Journal of Statistical Software*, 78, 1-56. <https://doi.org/10.18637/jss.v078.i02>
- Przeworski, A., Peterson, E., & Piedra, A. (2021). A systematic review of the efficacy, harmful effects, and ethical issues related to sexual orientation change efforts. *Clinical Psychology: Science and Practice*, 28, 81. <https://doi.org/10.1111/cpsp.12377>
- Seto, M. C. (2018). *Pedophilia and sexual offending against children* (2<sup>nd</sup> ed.). Washington, DC: American Psychological Association. <https://doi.org/10.1037/0000107-005>
- Stern, J., Kordsmeyer, T. L., & Penke, L. (2021). A longitudinal evaluation of ovulatory cycle shifts in women's mate attraction and preferences. *Hormones and Behavior*, 128, 104916. <https://doi.org/10.1016/j.yhbeh.2020.104916>
- Storms, M. D. (1980). Theories of sexual orientation. *Journal of Personality and Social Psychology*, 38, 783. <https://doi.org/10.1037/0022-3514.38.5.783>
- Su, Y., & Zheng, L. (2023). Stability and change in asexuality: Relationship between sexual/romantic attraction and sexual desire. *Journal of Sex Research*, 60, 231-241. <https://doi.org/10.1080/00224499.2022.2045889>
- Walters, L., & Lalumière, M. L. (2025). Psychometric Evaluation of a Novel Measure of Sexual Attraction: The Sexual Attraction Inventory. *Psychology & Sexuality* (Submitted).
- Walters, L., McCluskie, E. N., Roberge, M., Moazami, S., & Lalumière, M. L. (2025). A systematic review of changes in sexual attractions. *Canadian Journal of Human Sexuality*, 34, 106-123. <https://doi.org/10.3138/cjhs-2024-0030>

Westlake, B., & Mahan, I. (2025). An international survey of BDSM practitioner demographics:  
The evolution of purpose for, participation in, and engagement with, kink activities.

*Journal of Sex Research*, 62, 341-359. <https://doi.org/10.1080/00224499.2023.2273266>

**Table 4. 1***Participant Biographic Information at Baseline.*

	<i>M (SD)</i>	Combined sample ( <i>N</i> = 1,914)		Prolific sample ( <i>n</i> = 998)		Online sample ( <i>n</i> = 916)	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Age		30.15 (9.14)		30.39 (9.37)		29.88 (8.89)	
Age bands <sup>1</sup>	Older adolescents	11	0.57	-	-	11	1.20
	Young adults	1458	76.18	749	75.05	709	77.40
	Adults	429	22.41	241	24.15	188	20.52
	Senior adults	16	0.84	-	-	-	-
Gender identity	Men	941	49.16	584	58.52	357	38.97
	Women	878	45.87	395	39.58	483	52.73
	TNBGNC+	95	4.96	19	1.90	76	8.30
Sex assigned at birth	Males	963	50.31	587	58.82	376	41.05
	Females	943	49.27	409	40.98	534	58.30
	“Other”	-	-	-	-	-	-
Sexual orientation <sup>2</sup>	Heterosexual	1096	57.26	754	75.55	342	37.34
	Homosexual	99	5.17	31	3.11	68	7.42
	Bisexual, pansexual, demisexual, queer, “other”	517	27.01	148	14.83	369	40.28
	Asexual	16	0.84	-	-	-	-
	Mostly heterosexual	143	7.47	45	4.51	98	10.70
	Mostly homosexual, questioning	43	2.25	12	1.20	31	3.38
Relationship status	Single (not dating and are having sex)	248	12.96	113	11.32	135	14.74
	Single (not dating and not having sex)	491	25.65	277	27.76	214	23.36
	In a committed relationship	689	36.00	397	39.78	292	31.88
	In multiple committed relationships	26	1.36	-	-	20	2.18
	Married to a partner	332	17.35	170	17.03	162	17.69
	In a common-law relationship	89	4.65	28	2.81	61	6.66
	“Other”	39	2.04	-	-	32	3.49
Country of residence	Canada	482	25.18	38	3.80	444	48.50
	USA	295	15.41	-	-	291	31.77
	Portugal	175	9.14	172	17.23	-	-
	South Africa	173	9.04	171	17.13	-	-
	Poland	156	8.15	150	15.03	-	-
	United Kingdom	127	6.64	73	7.31	54	5.90
	Mexico	68	3.55	67	6.71	-	-
	Italy	58	3.03	54	5.41	-	-
	Spain	47	2.46	47	4.71	-	-
	Hungary	35	1.83	35	3.51	-	-

Greece	34	1.78	32	3.21	-	-
Germany	30	1.57	15	1.50	15	1.64
Netherlands	29	1.52	22	2.20	-	-
France	23	1.20	16	1.60	-	-
Sweden	21	1.10	18	1.80	-	-
Chile	17	0.89	17	1.70	-	-
Czech Republic	14	0.73	11	1.10	-	-
Ireland	13	0.68	-	-	-	-
Australia	11	0.57	-	-	10	1.09
Austria	10	0.52	-	-	-	-
Remaining countries	96	5.02	60	6.01	102	11.14

*Note.* Any cell with fewer than 10 participants was replaced with “-” to preserve anonymity.

TNBGNC+ = Transgender, non-binary, gender non-conforming, and other participants who requested to be analyzed separately from cisgender categories.

<sup>1</sup>Age bands were created using the same convention as how age was separated on items from the SAI (i.e., “older adolescents” were defined as participants aged 16 – 17, “young adults” were aged 18 – 34, “adults” were 35 – 65, and “senior adults” were 65+ years old).

<sup>2</sup>Sexual orientation groups were collapsed into fewer categories for analytical purposes.

**Table 4. 2***Mean and Median Scores on the Sexual Attraction Inventory (SAI) Over Time.*

SAI Item Number and Label	Time 1				Time 2				Time 3			
	<i>M</i> ( <i>SD</i> ) Full Sample	Mdn	<i>M</i> ( <i>SD</i> ) Completers	Mdn	<i>M</i> ( <i>SD</i> ) Full Sample	Mdn	<i>M</i> ( <i>SD</i> ) Completers	Mdn	<i>M</i> ( <i>SD</i> ) Full Sample	Mdn	<i>M</i> ( <i>SD</i> ) Completers	Mdn
1. People who appear to be men	47.98 (41.54)	55	49.44 (41.64)	63	48.08 (41.22)	57	49.66 (41.42)	62	50.16 (40.98)	62	48.86 (41.08)	57
2. People who appear to be women	63.83 (36.54)	77	63.19 (36.74)	77	64.12 (36.32)	78	63.99 (36.25)	77	63.95 (35.41)	77	63.85 (35.63)	77
3. People who appear to be a gender outside the binary of men/women	28.79 (30.78)	16	29.11 (31.05)	16	30.29 (30.39)	21	30.88 (30.81)	21	30.97 (31.27)	19	29.87 (30.70)	18
4. Masculinity	47.34 (38.92)	52	47.96 (38.81)	55	47.32 (38.45)	51	48.90 (38.85)	55	50.13 (38.57)	59	48.97 (38.66)	57
5. Femininity	64.79 (34.51)	77	63.87 (34.73)	75	65.74 (34.13)	77	65.57 (34.09)	77	65.75 (33.62)	76	66.14 (33.62)	77
6. Androgyny (having both masculine and feminine characteristics)	41.83 (33.64)	43	41.91 (34.03)	42	41.63 (33.27)	43	42.33 (33.67)	44	42.51 (32.61)	44	41.67 (32.60)	42
7. Senior adults (65+)	9.00 (17.55)	0	8.75 (17.92)	0	9.54 (18.52)	0	10.19 (19.35)	0	10.62 (18.68)	0	10.69 (18.95)	0
8. Adults (35-65)	58.14 (30.77)	65	59.42 (30.28)	66	59.63 (29.62)	66	61.38 (28.87)	68	63.33 (27.80)	69	63.64 (27.92)	69
9. Young adults (18-34)	78.11 (25.37)	86	77.59 (25.61)	86	77.29 (25.32)	85	77.09 (25.37)	85	76.13 (25.92)	84	76.05 (26.06)	84
10. Older adolescents (16-17)	17.33 (27.67)	0	16.16 (26.33)	0	16.25 (26.51)	0	16.23 (26.30)	0	16.87 (26.57)	0	17.66 (27.04)	0
11. Younger adolescents (12-15)	6.60 (20.15)	0	5.05 (16.97)	0	5.44 (17.38)	0	5.24 (16.92)	0	6.21 (18.42)	0	6.56 (19.00)	0
12. Children (4-11)	5.16 (20.31)	0	3.07 (15.40)	0	3.77 (17.10)	0	3.50 (16.32)	0	3.23 (15.80)	0	3.03 (15.07)	0
13. Toddlers (1-3)	2.53 (13.85)	0	1.43 (10.64)	0	1.55 (10.75)	0	1.04 (9.12)	0	1.53 (10.42)	0	1.45 (10.22)	0
14. Babies (0-11 months)	1.52 (10.37)	0	0.71 (6.59)	0	1.24 (8.89)	0	0.65 (6.22)	0	1.16 (8.16)	0	1.10 (7.95)	0
15. Touching material like rubber, PVC, or leather	12.67 (22.61)	0	12.10 (21.86)	0	12.22 (21.77)	0	12.07 (21.45)	0	11.97 (20.99)	0	11.56 (20.72)	0
16. Touching an object like shoes, gloves, or plush toys	8.23 (18.90)	0	7.31 (17.20)	0	7.51 (17.20)	0	7.52 (17.31)	0	8.48 (18.39)	0	8.26 (17.91)	0
17. Kissing, fondling, and touching someone's feet	18.88 (28.12)	3	16.33 (25.80)	2	17.73 (26.81)	3	16.96 (26.17)	3	17.12 (25.91)	3	16.67 (25.50)	3
18. Having sex with an animal (e.g., cats, dogs, horses)	4.22 (16.00)	0	3.60 (14.73)	0	2.94 (13.56)	0	2.83 (13.35)	0	3.09 (13.56)	0	2.86 (12.92)	0
19. Being spanked, beaten, or whipped by someone	33.67 (34.62)	21	34.16 (34.91)	21	33.87 (33.86)	23	35.29 (34.70)	24	35.11 (34.76)	23	34.27 (34.31)	23
20. Spanking, beating, or whipping someone	31.30 (32.79)	19	30.44 (31.80)	19	30.32 (31.65)	18	30.17 (31.25)	19	30.44 (30.98)	20	29.96 (30.40)	20
21. Being urinated on by someone (e.g., golden showers)	11.17 (24.49)	0	9.73 (23.16)	0	10.24 (23.57)	0	10.43 (23.54)	0	10.55 (23.31)	0	10.00 (22.35)	0
22. Urinating on someone (e.g., golden showers)	10.93 (23.30)	0	9.71 (21.45)	0	9.63 (22.19)	0	9.43 (21.55)	0	10.66 (22.18)	0	10.11 (21.36)	0
23. Imagining yourself as someone of another gender	17.05 (28.59)	0	16.70 (28.22)	0	15.58 (26.94)	0	16.07 (27.69)	0	16.13 (27.31)	0	16.13 (27.42)	0
24. Dressing up as someone of another gender	12.38 (24.61)	0	11.42 (22.93)	0	11.51 (22.88)	0	11.22 (22.53)	0	11.74 (23.11)	0	11.45 (22.90)	0

25. Being tied or handcuffed	48.78 (36.18)	54	49.01 (36.27)	56	47.43 (34.98)	50	48.77 (35.25)	50	48.00 (35.08)	52	47.04 (35.05)	50
26. Tying or handcuffing someone	45.47 (34.04)	49	45.07 (33.23)	49	43.51 (33.39)	47	43.96 (33.40)	47	44.46 (32.23)	49	43.26 (32.11)	48
27. Being controlled or dominated by someone	54.65 (35.58)	62	54.20 (35.38)	62	52.33 (35.08)	59	52.84 (35.35)	60	53.63 (34.48)	60	52.21 (34.29)	59
28. Controlling or dominating someone	47.70 (33.48)	51	46.49 (33.00)	49	45.99 (32.86)	49	45.87 (32.78)	49	46.57 (31.73)	51	45.48 (31.69)	50
29. Having sex with an adult woman	62.15 (39.35)	78	62.34 (39.47)	79	62.87 (39.15)	79	62.88 (39.10)	79	64.12 (38.13)	80	64.19 (38.28)	81
30. Having sex with an adult man	47.78 (42.80)	53	49.69 (42.69)	58	48.27 (42.89)	56	50.13 (42.90)	63	50.68 (42.64)	63	49.47 (42.76)	60
31. Verbally humiliating someone	11.54 (23.42)	0	10.76 (22.05)	0	11.95 (23.62)	0	11.75 (23.41)	0	12.25 (23.32)	0	11.51 (22.33)	0
32. Having someone verbally humiliate you	13.40 (26.01)	0	13.03 (25.50)	0	13.20 (25.93)	0	13.06 (25.59)	0	14.26 (26.29)	0	13.76 (25.50)	0
33. Being defecated on by someone (e.g., scat play)	1.68 (9.62)	0	1.17 (7.56)	0	1.41 (9.35)	0	1.09 (7.95)	0	1.19 (7.67)	0	1.16 (7.13)	0
34. Defecting on someone (e.g., scat play)	1.22 (7.93)	0	0.59 (3.45)	0	1.30 (8.89)	0	0.91 (6.80)	0	1.07 (7.14)	0	0.99 (6.57)	0
35. Cutting someone's skin	3.32 (13.42)	0	2.62 (11.81)	0	2.84 (12.12)	0	2.97 (12.73)	0	3.38 (12.80)	0	3.15 (12.04)	0
36. Having your skin cut	4.84 (16.54)	0	4.18 (14.85)	0	3.88 (14.28)	0	4.10 (14.48)	0	5.16 (16.99)	0	4.71 (16.00)	0
37. Having your breathing restricted during sexual activity	24.82 (32.48)	3	24.22 (32.10)	2	23.66 (31.26)	5	25.09 (32.14)	5	25.53 (32.48)	6	24.34 (31.73)	5
38. Touching or rubbing a stranger who is not expecting it	8.76 (20.54)	0	7.67 (18.41)	0	6.82 (17.63)	0	6.46 (17.14)	0	6.66 (17.03)	0	6.69 (17.00)	0
39. Pretending to rape someone	11.38 (24.13)	0	10.48 (22.86)	0	11.16 (23.42)	0	11.13 (23.51)	0	11.11 (23.21)	0	11.25 (23.42)	0
40. Watching an unsuspecting stranger who is not expecting it	22.07 (29.67)	3	20.73 (28.60)	2	19.66 (27.49)	3	19.23 (27.33)	2	20.12 (28.25)	3	20.03 (27.98)	3
41. Exposing your genitals to a stranger who is not expecting it	5.40 (16.87)	0	3.54 (12.90)	0	4.19 (13.82)	0	3.74 (12.85)	0	4.11 (13.17)	0	3.86 (12.31)	0
42. Forcing someone into sexual activity	8.27 (20.26)	0	7.45 (19.50)	0	7.84 (19.94)	0	7.44 (19.54)	0	8.35 (20.32)	0	8.09 (19.89)	0
43. Making obscene phone calls to someone who is not expecting it	5.80 (17.33)	0	4.75 (15.34)	0	4.37 (13.90)	0	4.01 (13.60)	0	4.54 (13.65)	0	4.58 (13.69)	0

*Note.* Mdn = median score; Time 1 full sample  $n = 1,914$ ; Time 2 full sample  $n = 1,295$ ; Time 3 full sample  $n = 1,027$ ; Completers = participants who completed all three time points,  $n = 901$ . Scores could vary from 0 to 100.

**Table 4.3***Ratings of Items on the Sexual Attraction Inventory (SAI) at Baseline by Gender.*

Item from the SAI	Men ( <i>n</i> = 941) <i>M</i> ( <i>SD</i> )	Women ( <i>n</i> = 878) <i>M</i> ( <i>SD</i> )	TNBGNC+ ( <i>n</i> = 95) <i>M</i> ( <i>SD</i> )
People who appear to be men	17.94 (31.15)	79.55 (25.13)	53.87 (33.72)
People who appear to be women	81.82 (29.05)	44.25 (34.46)	66.74 (28.63)
People who appear to be a gender outside the binary of men/women	22.41 (27.08)	31.46 (31.20)	67.22 (30.04)
Masculinity	19.86 (29.42)	75.80 (25.17)	56.49 (32.53)
Femininity	82.27 (26.28)	45.90 (33.05)	66.20 (27.40)
Androgyny (having both masculine and feminine characteristics)	33.31 (30.07)	47.46 (34.46)	74.17 (28.78)
Senior adults (65+)	10.03 (18.90)	7.72 (15.94)	10.57 (17.27)
Adults (35-65)	60.02 (30.20)	56.83 (31.23)	51.58 (30.89)
Young adults (18-34)	84.67 (20.94)	72.19 (27.41)	67.88 (29.04)
Older adolescents (16-17)	27.32 (32.23)	6.88 (16.15)	15.03 (27.08)
Younger adolescents (12-15)	10.22 (24.52)	2.11 (10.85)	12.23 (28.36)
Children (4-11)	7.24 (23.89)	2.30 (13.52)	11.07 (28.81)
Toddlers (1-3)	2.96 (14.86)	1.52 (10.66)	7.68 (24.53)
Babies (0-11 months)	2.26 (12.92)	0.63 (6.05)	2.49 (12.82)
Touching material like rubber, PVC, or leather	13.66 (24.03)	10.88 (20.24)	19.48 (26.81)
Touching an object like shoes, gloves, or plush toys	9.21 (20.01)	6.65 (16.55)	13.16 (25.58)
Kissing, fondling, and touching someone's feet	26.82 (31.18)	10.70 (21.92)	15.86 (24.88)
Having sex with an animal (e.g., cats, dogs, horses)	4.73 (16.48)	3.04 (14.08)	10.15 (24.38)
Being spanked, beaten, or whipped by someone	23.49 (31.18)	43.26 (36.03)	45.80 (37.31)
Spanking, beating, or whipping someone	37.66 (33.34)	24.12 (30.35)	34.67 (35.69)
Being urinated on by someone (e.g., golden showers)	13.73 (26.21)	7.42 (20.71)	20.53 (32.46)
Urinating on someone (e.g., golden showers)	14.81 (26.11)	6.01 (17.56)	17.97 (30.48)
Imagining yourself as someone of another gender	15.07 (27.51)	16.28 (27.51)	43.86 (35.19)
Dressing up as someone of another gender	11.46 (23.88)	10.85 (22.50)	35.68 (36.39)
Being tied or handcuffed	37.45 (34.26)	59.46 (34.54)	62.24 (35.11)
Tying or handcuffing someone	47.70 (33.98)	42.47 (33.59)	51.15 (36.68)
Being controlled or dominated by someone	44.34 (34.80)	64.63 (33.42)	64.46 (33.66)
Controlling or dominating someone	54.89 (33.22)	39.76 (31.71)	49.85 (35.80)
Having sex with an adult woman	79.95 (31.56)	42.43 (38.09)	68.13 (34.19)
Having sex with an adult man	17.94 (32.69)	78.94 (27.86)	55.24 (36.24)
Verbally humiliating someone	14.53 (25.65)	7.52 (19.06)	19.06 (29.84)
Having someone verbally humiliate you	12.31 (24.83)	13.23 (26.01)	25.86 (33.57)
Being defecated on by someone (e.g., scat play)	2.53 (11.72)	0.53 (4.89)	3.79 (16.17)
Defecting on someone (e.g., scat play)	1.75 (9.63)	0.41 (2.95)	3.37 (16.05)
Cutting someone's skin	3.57 (14.30)	2.30 (10.30)	10.27 (23.93)
Having your skin cut	3.62 (14.25)	4.81 (16.44)	17.25 (29.11)
Having your breathing restricted during sexual activity	15.95 (26.74)	32.62 (34.78)	40.60 (37.78)
Touching or rubbing a stranger who is not expecting it	11.25 (22.64)	5.86 (17.18)	11.01 (23.62)
Pretending to rape someone	16.78 (27.49)	5.03 (17.11)	16.74 (29.41)
Watching an unsuspecting stranger who is not expecting it	30.05 (32.55)	13.67 (23.62)	20.66 (28.50)
Exposing your genitals to a stranger who is not expecting it	6.31 (18.14)	4.05 (14.41)	8.87 (22.95)
Forcing someone into sexual activity	11.84 (23.68)	4.08 (14.17)	11.65 (23.86)
Making obscene phone calls to someone who is not expecting it	5.77 (17.39)	5.85 (17.26)	5.56 (17.49)

*Note.* TNBGNC+ = Transgender, non-binary, gender non-conforming, and other participants who requested to be analyzed separately from cisgender categories. Scores could vary from 0 to 100.

**Table 4. 4***Ratings of Items on the Sexual Attraction Inventory (SAI) at Baseline by Age Bands.*

Items from the SAI	Older Adolescents ( <i>n</i> = 11) <i>M</i> ( <i>SD</i> )	Young Adults ( <i>n</i> = 1458) <i>M</i> ( <i>SD</i> )	Adults ( <i>n</i> = 429) <i>M</i> ( <i>SD</i> )	Older Adults ( <i>n</i> = 16) <i>M</i> ( <i>SD</i> )
People who appear to be men	63.64 (34.06)	50.71 (41.13)	38.90 (41.80)	31.94 (39.76)
People who appear to be women	67.82 (29.67)	63.49 (35.88)	65.04 (38.80)	60.44 (40.50)
People who appear to be a gender outside the binary of men/women	38.27 (31.49)	30.65 (31.19)	22.51 (28.50)	20.25 (30.11)
Masculinity	48.73 (32.22)	50.10 (38.56)	38.66 (39.08)	27.94 (35.43)
Femininity	65.36 (25.62)	64.30 (33.81)	66.36 (36.92)	66.56 (38.16)
Androgyny (having both masculine and feminine characteristics)	57.27 (26.59)	44.65 (33.75)	32.36 (31.57)	27.75 (31.6)
Senior adults (65+)	7.00 (16.547)	7.82 (16.04)	11.66 (20.00)	46.56 (29.36)
Adults (35-65)	39.18 (34.47)	53.33 (30.71)	74.51 (24.81)	70.13 (21.03)
Young adults (18-34)	78.18 (20.08)	82.29 (21.43)	65.24 (31.5)	42.06 (31.89)
Older adolescents (16-17)	73.45 (23.70)	16.92 (27.38)	17.42 (27.61)	14.38 (19.50)
Younger adolescents (12-15)	19.18 (30.67)	5.96 (18.88)	8.06 (23.10)	17.06 (31.34)
Children (4-11)	14.00 (32.80)	4.30 (18.38)	7.26 (24.48)	21.06 (38.33)
Toddlers (1-3)	10.00 (24.38)	2.08 (12.31)	3.90 (17.98)	1.94 (6.14)
Babies (0-11 months)	5.82 (18.967)	1.30 (9.71)	2.21 (12.27)	0.50 (1.26)
Touching material like rubber, PVC, or leather	28.82 (24.37)	12.44 (22.47)	13.31 (23.20)	5.31 (11.79)
Touching an object like shoes, gloves, or plush toys	11.45 (15.67)	8.67 (19.64)	6.93 (16.53)	1.19 (3.02)
Kissing, fondling, and touching someone's feet	18.64 (26.20)	18.92 (28.23)	18.96 (27.91)	12.81 (25.92)
Having sex with an animal (e.g., cats, dogs, horses)	6.36 (17.66)	4.43 (16.44)	3.61 (14.70)	0.19 (0.40)
Being spanked, beaten, or whipped by someone	21.91 (25.79)	36.50 (35.18)	25.23 (31.40)	10.00 (23.48)
Spanking, beating, or whipping someone	31.55 (25.51)	32.79 (33.21)	26.75 (31.10)	17.69 (30.86)
Being urinated on by someone (e.g., golden showers)	9.73 (18.99)	11.04 (24.35)	11.62 (25.16)	12.00 (24.41)
Urinating on someone (e.g., golden showers)	11.91 (19.38)	10.87 (23.24)	11.38 (23.95)	4.06 (8.57)
Imagining yourself as someone of another gender	20.36 (31.00)	17.52 (28.76)	15.20 (27.82)	21.88 (32.44)
Dressing up as someone of another gender	20.27 (29.63)	12.31 (24.56)	12.53 (24.90)	9.50 (17.42)
Being tied or handcuffed	59 (32.91)	52.24 (35.75)	37.87 (35.17)	19.06 (33.80)
Tying or handcuffing someone	59.18 (30.48)	46.87 (34.01)	41.28 (33.67)	21.13 (31.39)
Being controlled or dominated by someone	61.18 (37.38)	58.46 (34.52)	42.66 (36.03)	24.06 (34.12)
Controlling or dominating someone	58.27 (31.43)	49.46 (33.23)	42.45 (33.61)	20.50 (28.28)
Having sex with an adult woman	63.09 (34.52)	61.37 (39.04)	64.83 (40.66)	61.00 (34.43)
Having sex with an adult man	50.64 (38.25)	50.11 (42.54)	40.28 (43.02)	33.81 (41.90)
Verbally humiliating someone	15.55 (21.17)	12.36 (24.18)	9.03 (20.90)	1.69 (4.56)
Having someone verbally humiliate you	22.91 (25.57)	14.74 (27.22)	8.77 (20.91)	9.44 (22.96)
Being defecated on by someone (e.g., scat play)	0.45 (1.21)	1.66 (9.36)	1.72 (10.56)	2.63 (10.50)
Defecting on someone (e.g., scat play)	3.27 (7.62)	1.23 (7.93)	1.16 (8.08)	0.13 (0.34)
Cutting someone's skin	4.73 (8.81)	3.76 (14.09)	1.92 (11.14)	0.00 (0.00)
Having your skin cut	7.91 (18.05)	5.54 (17.63)	2.55 (12.24)	0.06 (0.25)
Having your breathing restricted during sexual activity	26.27 (34.49)	28.07 (33.542)	14.41 (26.122)	6.56 (22.713)
Touching or rubbing a stranger who is not expecting it	12.73 (28.67)	8.16 (19.705)	10.54 (22.624)	13.63 (27.789)
Pretending to rape someone	23.82 (37.64)	11 (23.682)	12.69 (25.49)	2.56 (6.25)
Watching an unsuspecting stranger who is not expecting it	24.45 (32.91)	20.09 (28.84)	28 (31.096)	41.56 (36.724)
Exposing your genitals to a stranger who is not expecting it	17.91 (36.481)	4.98 (15.844)	6.36 (19.214)	9.44 (17.941)
Forcing someone into sexual activity	17.55 (27.588)	7.76 (19.807)	9.93 (21.696)	3.88 (11.587)
Making obscene phone calls to someone who is not expecting it	13.27 (19.116)	6.22 (17.92)	4.38 (15.198)	0.06 (0.25)

*Note.* Scores could vary from 0 to 100.

**Table 4. 5***Changes in Sexual Attractions from the Sexual Attraction Inventory (SAI) Over Time.*

Items from the SAI	<sup>a</sup> Change between Time 1 – 2 ( $d_{wsc}$ )	<sup>a</sup> Bootstrapped lower confidence interval (2.50%)	<sup>a</sup> Bootstrapped upper confidence interval (97.50%)	<sup>b</sup> Change between Time 1 – 3 ( $d_{wsc}$ )	<sup>b</sup> Bootstrapped lower confidence interval (2.50%)	<sup>b</sup> Bootstrapped upper confidence interval (97.50%)	<sup>a</sup> Average units of absolute individual change from Time 1 – 2	<sup>b</sup> Average units of absolute individual change from Time 1 – 3	<sup>b</sup> Time 1 – 3 RCI	<sup>b</sup> $n$ (%) of participants who reliably changed
People who appear to be men	0.20	0.18	0.22	0.21	0.19	0.23	8.36 (12.67)	8.48 (12.87)	16.29	173 (16.86)
People who appear to be women	0.30	0.27	0.32	0.32	0.29	0.35	10.81 (14.66)	11.41 (15.70)	17.61	204 (19.88)
People who appear to be a gender outside the binary of men/women	0.41	0.38	0.44	0.40	0.37	0.43	12.55 (15.50)	12.47 (15.23)	23.07	188 (18.32)
Masculinity	0.29	0.27	0.31	0.29	0.26	0.31	11.26 (14.38)	11.15 (14.04)	21.54	172 (16.76)
Femininity	0.37	0.34	0.39	0.37	0.34	0.41	12.58 (15.73)	12.78 (16.31)	25.38	151 (14.72)
Androgyny (having both masculine and feminine characteristics)	0.48	0.45	0.51	0.47	0.44	0.50	15.97 (17.50)	15.66 (16.65)	28.46	188 (18.32)
Senior adults (65+)	0.41	0.37	0.45	0.40	0.36	0.45	7.24 (12.75)	7.36 (11.84)	26.17	76 (7.41)
Adults (35-65)	0.55	0.52	0.58	0.59	0.56	0.63	16.65 (15.94)	17.23 (16.71)	33.55	165 (16.08)
Young adults (18-34)	0.49	0.46	0.53	0.49	0.45	0.53	12.38 (14.50)	12.59 (14.20)	26.64	143 (13.94)
Older adolescents (16-17)	0.38	0.35	0.42	0.41	0.37	0.45	10.18 (16.35)	10.82 (17.12)	30.21	119 (11.60)
Younger adolescents (12-15)	0.19	0.16	0.23	0.23	0.20	0.28	3.35 (10.08)	4.14 (12.44)	22.31	60 (5.85)
Children (4-11)	0.13	0.10	0.17	0.11	0.08	0.15	2.24 (11.92)	1.73 (9.94)	32.96	14 (1.36)
Toddlers (1-3)	0.12	0.08	0.16	0.11	0.07	0.16	1.38 (9.36)	1.24 (8.71)	24.78	16 (1.56)
Babies (0-11 months)	0.14	0.10	0.19	0.15	0.11	0.19	1.08 (7.46)	1.14 (7.52)	18.60	16 (1.56)
Touching material like rubber, PVC, or leather	0.53	0.49	0.57	0.51	0.46	0.56	11.61 (18.72)	10.88 (16.98)	29.23	137 (13.35)
Touching an object like shoes, gloves, or plush toys	0.48	0.44	0.53	0.49	0.44	0.55	8.25 (16.08)	8.92 (16.84)	31.70	100 (9.75)
Kissing, fondling, and touching someone's feet	0.45	0.41	0.49	0.43	0.39	0.47	11.85 (18.51)	11.11 (16.81)	31.41	115 (11.21)
Having sex with an animal (e.g., cats, dogs, horses)	0.24	0.20	0.28	0.21	0.17	0.26	3.30 (12.88)	3.09 (12.01)	32.81	26 (2.53)
Being spanked, beaten, or whipped by someone	0.44	0.41	0.47	0.46	0.43	0.50	14.98 (17.99)	16.16 (19.41)	33.61	159 (15.50)
Spanking, beating, or whipping someone	0.53	0.50	0.57	0.56	0.53	0.61	16.91 (19.91)	17.70 (20.02)	32.96	208 (20.27)
Being urinated on by someone (e.g., golden showers)	0.27	0.24	0.30	0.29	0.25	0.33	6.20 (14.80)	6.80 (15.30)	22.26	108 (10.53)
Urinating on someone (e.g., golden showers)	0.27	0.24	0.30	0.32	0.28	0.36	5.95 (13.04)	7.07 (14.69)	25.23	96 (9.36)
Imagining yourself as someone of another gender	0.45	0.41	0.49	0.46	0.42	0.50	12.42 (21.02)	12.76 (20.91)	36.72	126 (12.28)

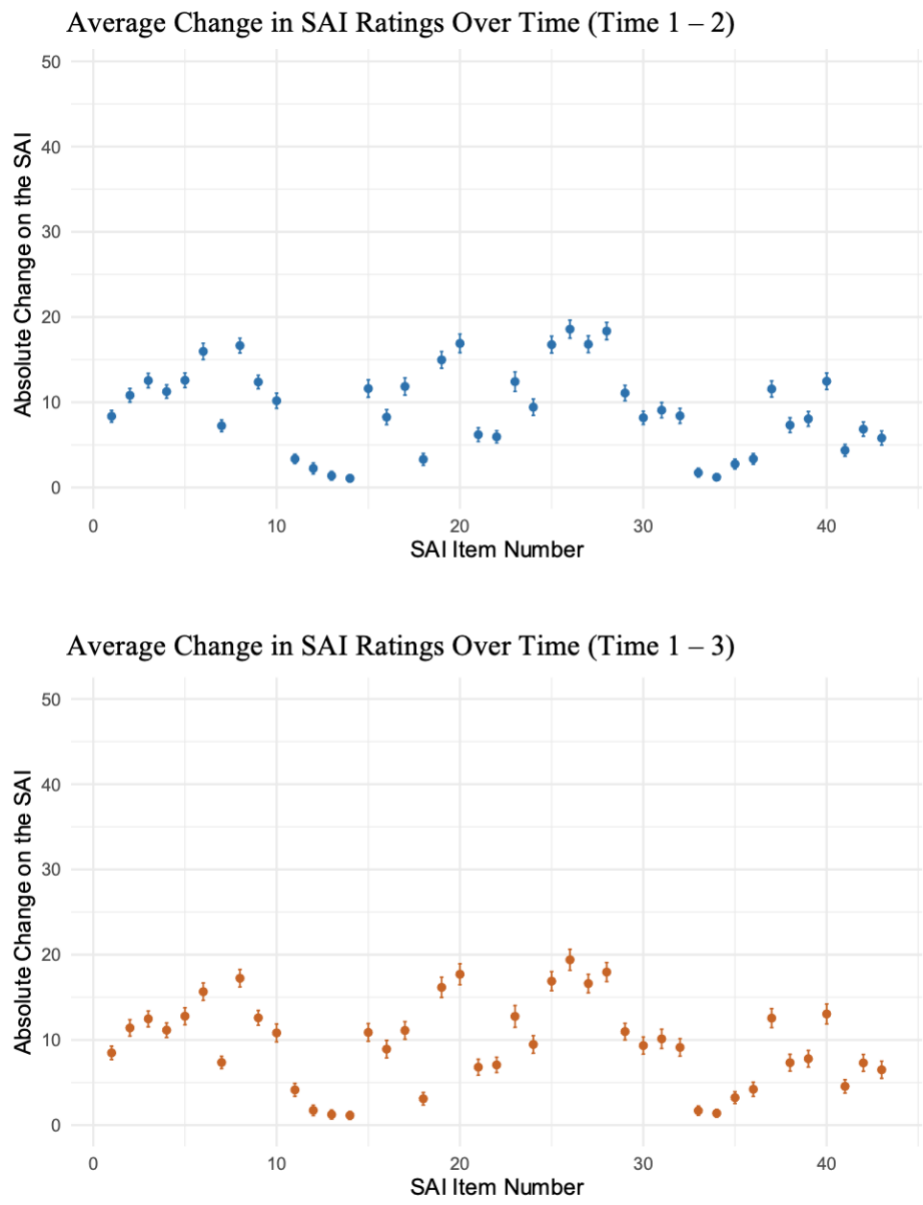
Dressing up as someone of another gender	0.41	0.37	0.45	0.41	0.36	0.45	9.42 (17.63)	9.47 (16.92)	31.39	108 (10.53)
Being tied or handcuffed	0.47	0.44	0.51	0.47	0.44	0.51	16.76 (18.16)	16.89 (18.22)	34.89	157 (15.30)
Tying or handcuffing someone	0.56	0.52	0.59	0.59	0.55	0.63	18.57 (19.44)	19.40 (20.12)	39.54	166 (16.18)
Being controlled or dominated by someone	0.48	0.45	0.51	0.48	0.44	0.51	16.81 (18.00)	16.61 (17.72)	35.31	152 (14.81)
Controlling or dominating someone	0.56	0.52	0.59	0.55	0.52	0.59	18.35 (18.56)	17.96 (18.22)	38.85	133 (12.96)
Having sex with an adult woman	0.28	0.26	0.31	0.28	0.26	0.31	11.08 (16.60)	10.98 (15.93)	24.42	142 (13.84)
Having sex with an adult man	0.19	0.17	0.21	0.22	0.19	0.25	8.18 (14.14)	9.34 (16.41)	33.49	71 (6.92)
Verbally humiliating someone	0.40	0.36	0.43	0.44	0.40	0.48	9.07 (16.50)	10.12 (18.41)	25.97	155 (15.11)
Having someone verbally humiliate you	0.33	0.30	0.36	0.35	0.31	0.39	8.41 (16.15)	9.12 (16.74)	31.26	101 (9.84)
Being defecated on by someone (e.g., scat play)	0.19	0.15	0.24	0.21	0.16	0.26	1.74 (9.55)	1.69 (8.90)	6.13	49 (4.76)
Defecating on someone (e.g., scat play)	0.15	0.11	0.19	0.24	0.20	0.27	1.20 (6.82)	1.39 (7.36)	9.08	36 (3.51)
Cutting someone's skin	0.23	0.19	0.27	0.25	0.21	0.30	2.75 (10.55)	3.22 (11.18)	11.81	83 (8.09)
Having your skin cut	0.23	0.20	0.27	0.26	0.21	0.30	3.36 (11.54)	4.21 (13.64)	17.56	76 (7.41)
Having your breathing restricted during sexual activity	0.37	0.34	0.40	0.39	0.35	0.42	11.56 (17.29)	12.56 (18.19)	28.59	159 (15.50)
Touching or rubbing a stranger who is not expecting it	0.40	0.36	0.44	0.41	0.37	0.46	7.32 (15.90)	7.33 (16.11)	33.63	76 (7.41)
Pretending to rape someone	0.35	0.31	0.38	0.34	0.30	0.38	8.05 (15.91)	7.79 (15.98)	31.02	85 (8.28)
Watching an unsuspecting stranger who is not expecting it	0.44	0.41	0.48	0.46	0.42	0.50	12.47 (17.74)	13.04 (19.05)	42.29	96 (9.36)
Exposing your genitals to a stranger who is not expecting it	0.31	0.27	0.35	0.34	0.29	0.39	4.36 (12.66)	4.55 (12.78)	20.62	76 (7.41)
Forcing someone into sexual activity	0.35	0.31	0.38	0.37	0.33	0.42	6.85 (15.33)	7.30 (16.19)	44.88	53 (5.17)
Making obscene phone calls to someone who is not expecting it	0.39	0.35	0.43	0.44	0.39	0.49	5.8 (15.17)	6.49 (16.45)	21.82	100 (9.75)

*Note.* <sup>a</sup>*n* = 1,295; <sup>b</sup>*n* = 1,027; RCI = reliable change index; Time 2 = six months after Time 1; Time 3 = 12 months after Time 1; scores could vary from 0 to 100



**Figure 4. 2**

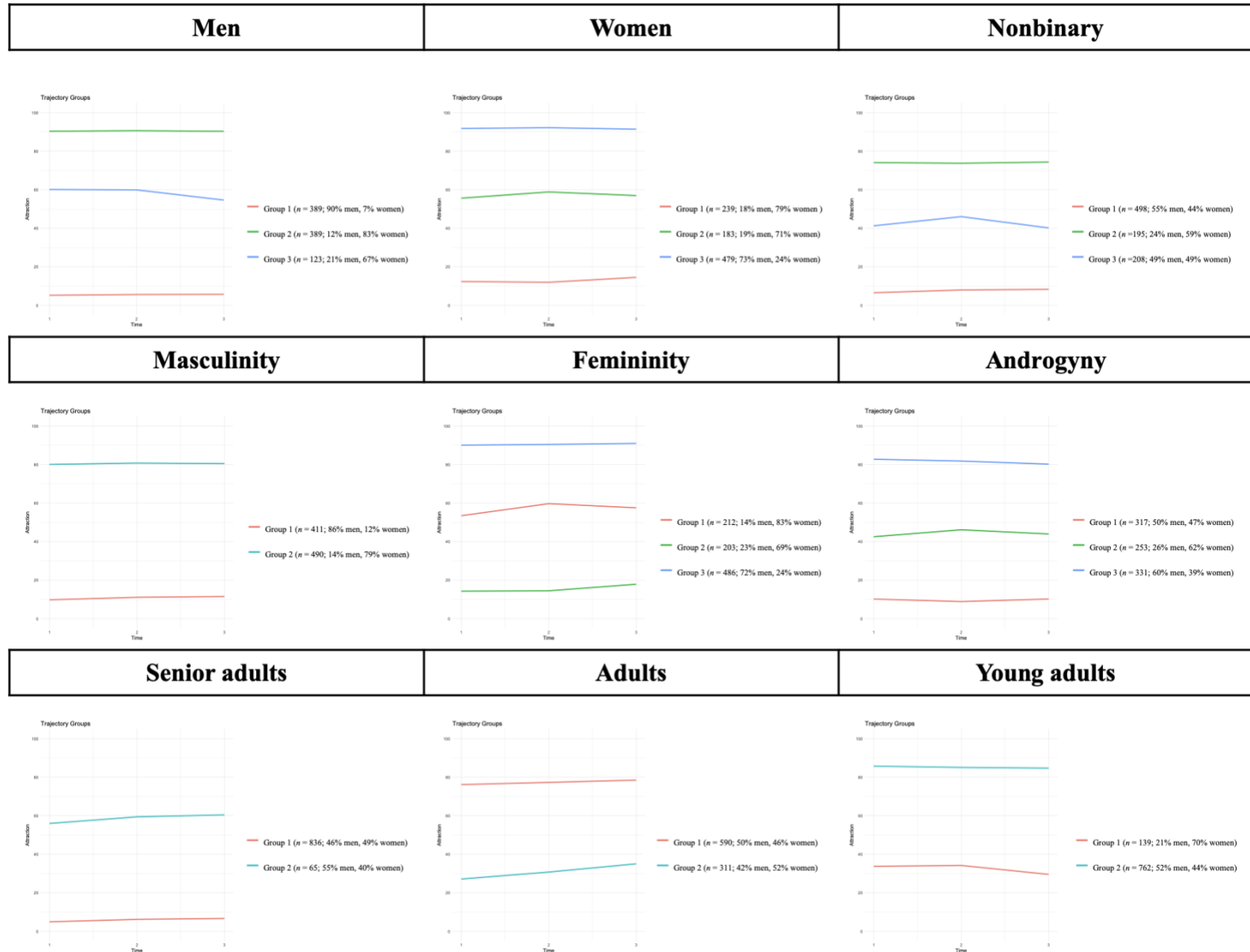
*Mean Absolute Change Scores of Items on the SAI Across Both Comparisons.*



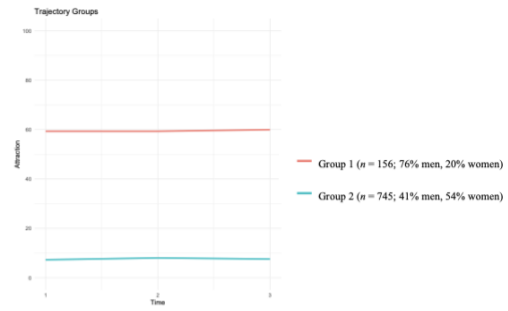
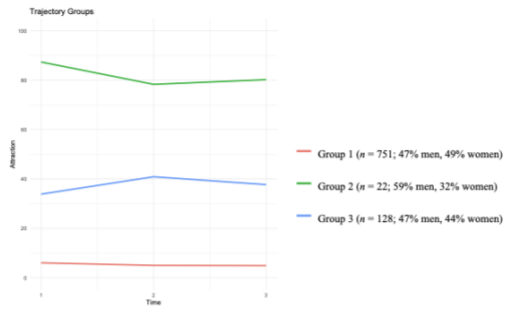
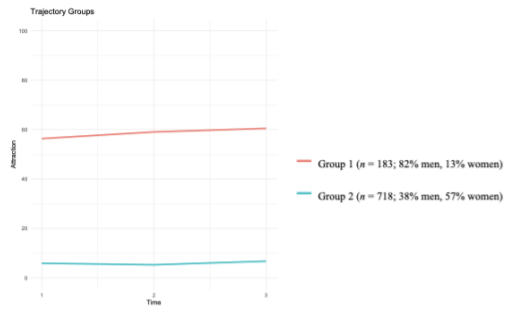
*Note.* The periods between Time 1 and Time 2 were 6 months, and between Time 1 and Time 3 were 12 months; for Time 1 – 2,  $n = 1,295$ ; for Time 1 – 3,  $n = 1,027$ ; SAI = Sexual Attraction Inventory. The y-axis has an upper limit of 100, which was suppressed to 50 for visualization.

**Figure 4. 3**

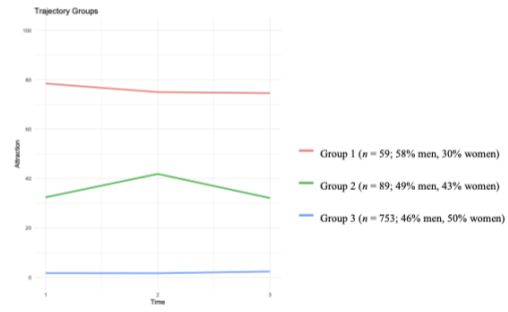
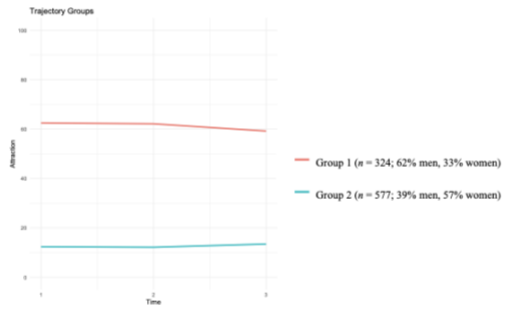
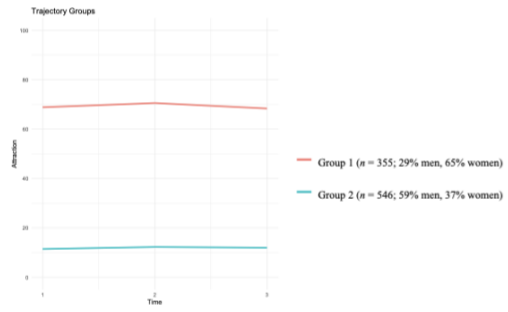
*Group-Based Trajectory Models for Each Item of the Sexual Attraction Inventory (SAI) Without a Distinct Change Group <sup>a</sup>.*



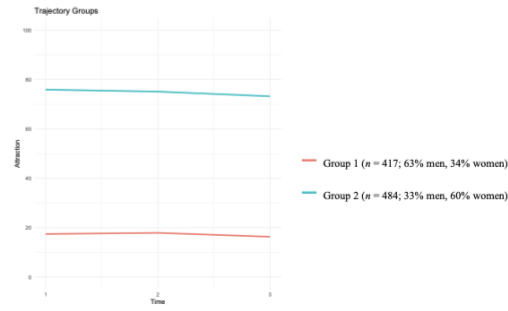
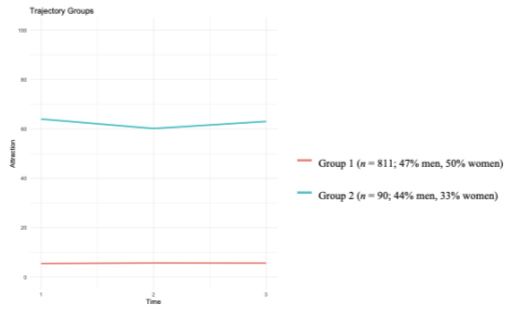
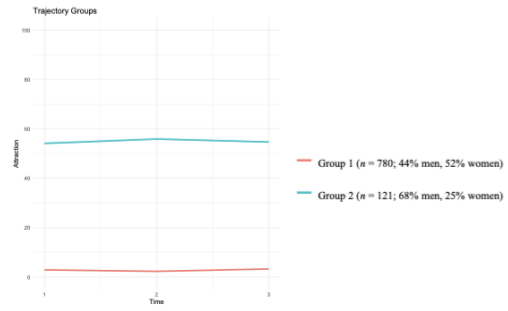
<b>Older adolescents</b>	<b>Touching rubber/leather</b>	<b>Feet</b>
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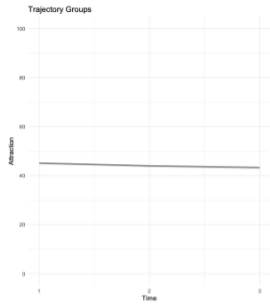
<b>Being spanked/beaten</b>	<b>Spanking/beating</b>	<b>Urinated on</b>
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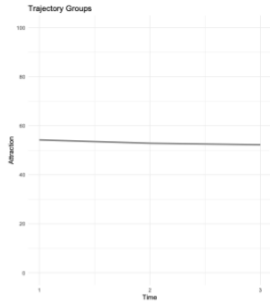
<b>Urinate on</b>	<b>Dress as another gender</b>	<b>Being tied/handcuffed</b>
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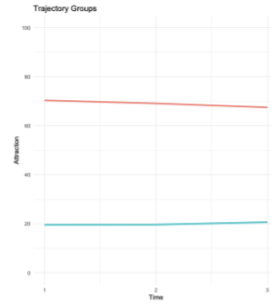
**Tying/handcuffing**      **Being controlled/dominated**      **Controlling/dominating**



Group 1 (n = 901; 47% men, 48% women)

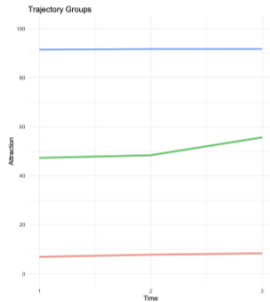


Group 1 (n = 901; 47% men, 48% women)

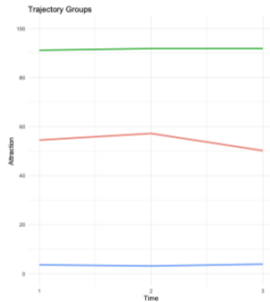


Group 1 (n = 477; 57% men, 38% women)  
Group 2 (n = 424; 37% men, 59% women)

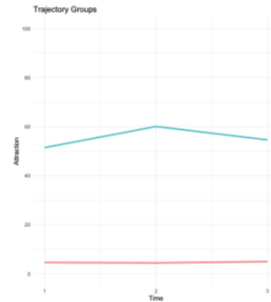
**Sex with adult woman**      **Sex with adult man**      **Verbally humiliate**



Group 1 (n = 140; 26% men, 66% women)  
Group 2 (n = 236; 16% men, 80% women)  
Group 3 (n = 525; 67% men, 29% women)

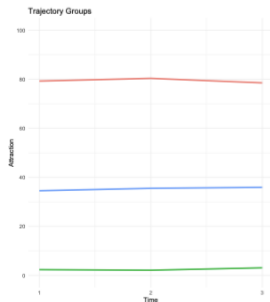


Group 1 (n = 399; 12% men, 82% women)  
Group 2 (n = 131; 29% men, 59% women)  
Group 3 (n = 371; 91% men, 7% women)

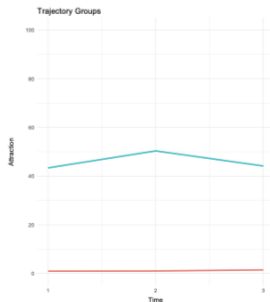


Group 1 (n = 785; 45% men, 51% women)  
Group 2 (n = 116; 61% men, 29% women)

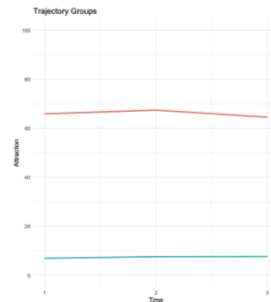
**Verbally humiliated**      **Cutting skin**      **Breathing restricted**



Group 1 (n = 134; 35% men, 53% women)  
Group 2 (n = 698; 51% men, 46% women)  
Group 3 (n = 69; 35% men, 56% women)

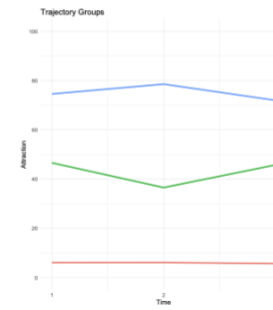
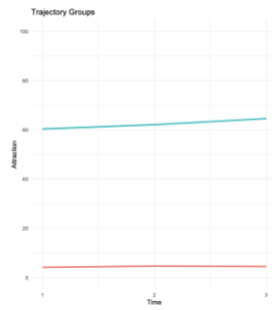
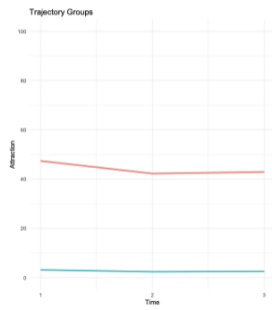


Group 1 (n = 865; 47% men, 48% women)  
Group 2 (n = 36; 39% men, 47% women)



Group 1 (n = 262; 24% men, 68% women)  
Group 2 (n = 639; 57% men, 40% women)

<b>Touching/rubbing stranger</b>	<b>Pretend to rape</b>	<b>Watching stranger</b>
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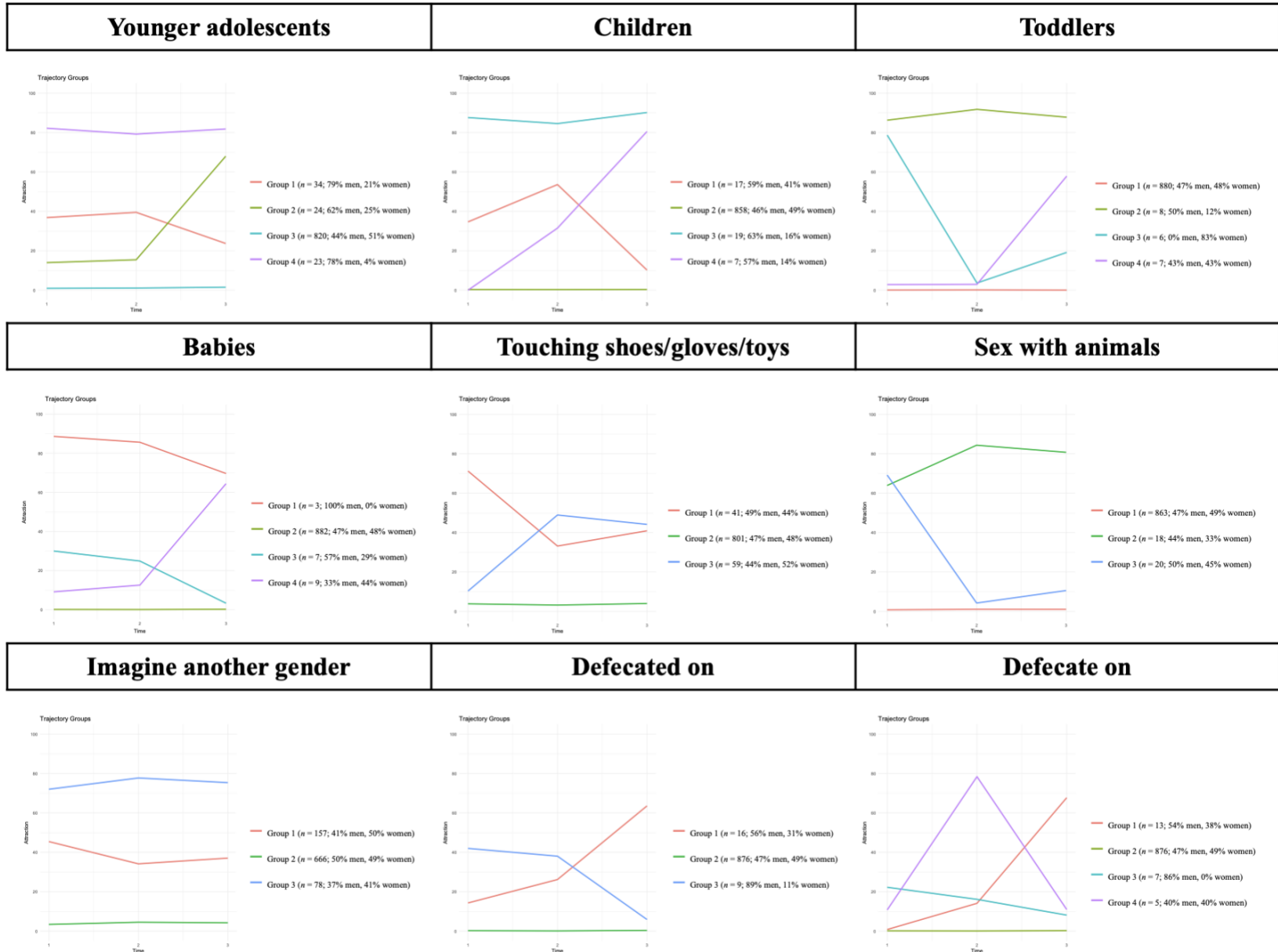


Note.  $n = 901$ .

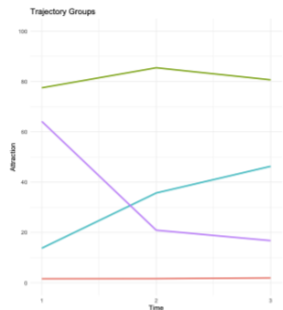
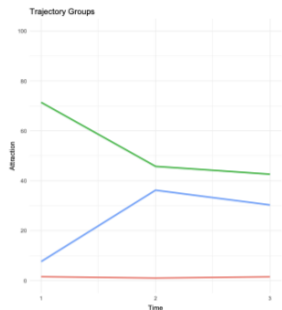
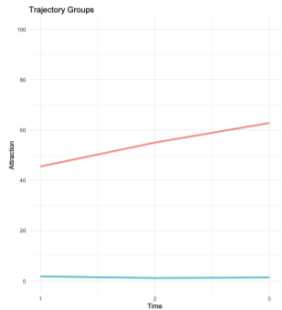
<sup>a</sup> A “distinct change group” is defined as a group with at least 10 units of absolute change between assessments

Figure 4. 4

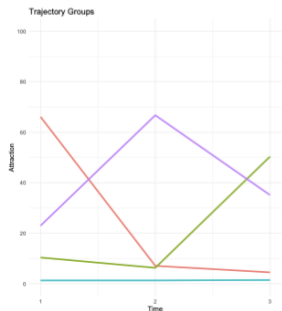
Group-Based Trajectory Models for Each Item of the Sexual Attraction Inventory (SAI) with a Distinct Change Group <sup>a</sup>.



<b>Having skin cut</b>	<b>Exposing genitals</b>	<b>Forcing sex</b>
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<b>Obscene phone calls</b>
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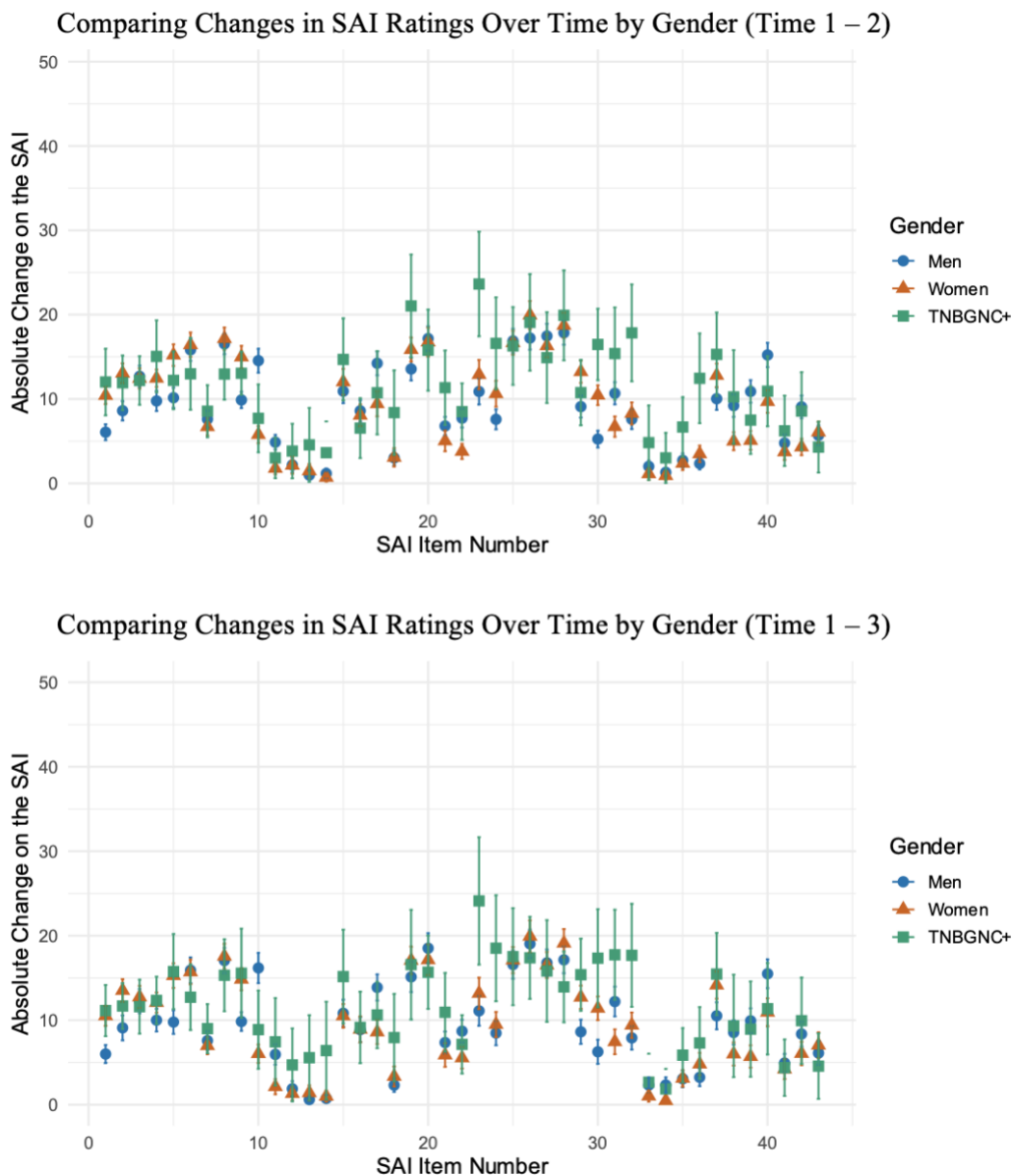


Note.  $n = 901$ .

<sup>a</sup> A “distinct change group” is defined as a group with at least 10 units of absolute change between assessments.

**Figure 4. 5**

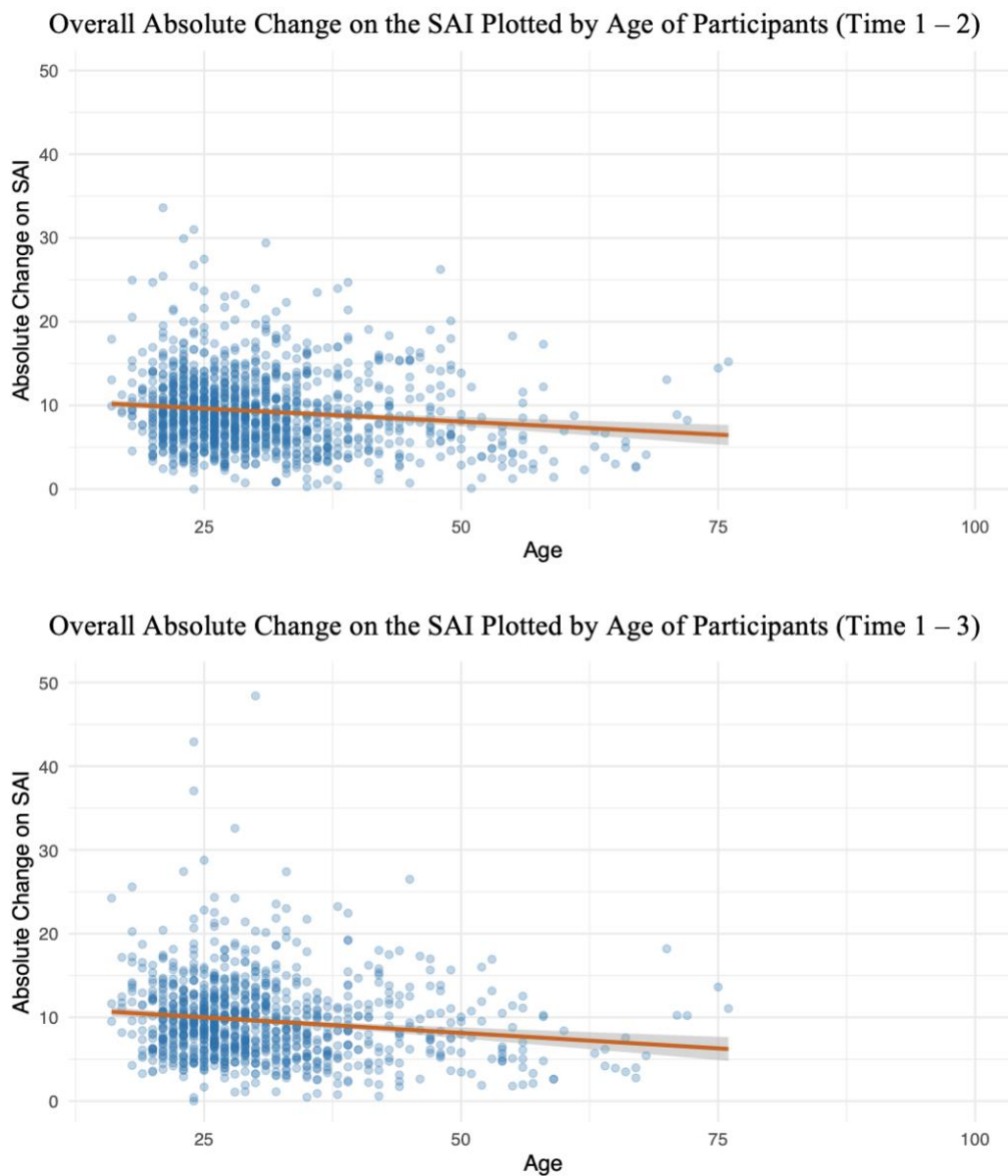
*Mean Absolute Change Scores of Items on the SAI by Gender Across both Time Comparisons.*



*Note.* The periods between Time 1 and Time 2 were 6 months, and between Time 1 and Time 3 were 12 months; for Time 1 – 2,  $n_{men} = 636$ ,  $n_{women} = 597$ ,  $n_{TNBGNC+} = 62$ ; for Time 1 – 3,  $n_{men} = 470$ ,  $n_{women} = 507$ ,  $n_{TNBGNC+} = 50$ ; SAI = Sexual Attraction Inventory. The y-axis has an upper limit of 100, which was suppressed to 50 for visualization.

**Figure 4. 6**

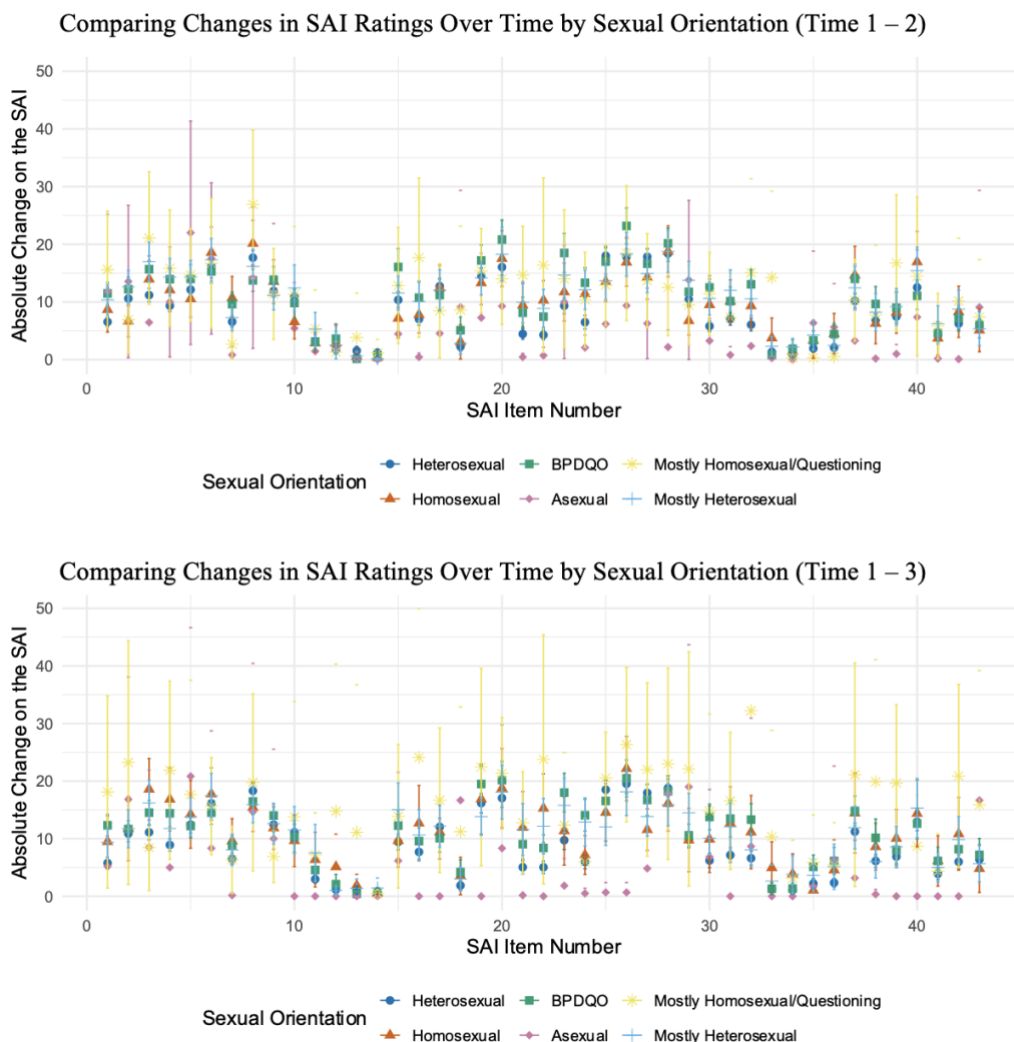
*Mean Absolute Change of all Items on the SAI by Age Across both Time Comparisons.*



*Note.* The periods between Time 1 and Time 2 were 6 months, and between Time 1 and Time 3 were 12 months; for Time 1 – 2,  $n = 1,295$ ; for Time 1 – 3,  $n = 1,027$ ; SAI = Sexual Attraction Inventory. The y-axis has an upper limit of 100, which was suppressed to 50 for visualization.

**Figure 4. 7**

*Mean Absolute Change Scores of Items on the SAI by Sexual Orientation Across both Time Comparisons.*



*Note.* The periods between Time 1 and Time 2 were 6 months, and between Time 1 and Time 3 were 12 months; for Time 1 – 2,  $n_{heterosexual} = 755$ ,  $n_{homosexual} = 72$ ,  $n_{BPDQO} = 174$ ,  $n_{asexual} = 11$ ,  $n_{mostly\ homosexual/questioning} = 13$ ,  $n_{mostly\ heterosexual} = 90$ ; for Time 1 – 3,  $n_{heterosexual} = 573$ ,  $n_{homosexual} = 50$ ,  $n_{BPDQO} = 164$ ,  $n_{asexual} = 6$ ,  $n_{mostly\ homosexual/questioning} = 9$ ,  $n_{mostly\ heterosexual} = 69$ ; BPDQO = bisexual, demisexual, pansexual, queer, and “other”; SAI = Sexual Attraction Inventory. The y-axis has an upper limit of 100, which was suppressed to 50 for visualization.

## **Supplemental Materials**

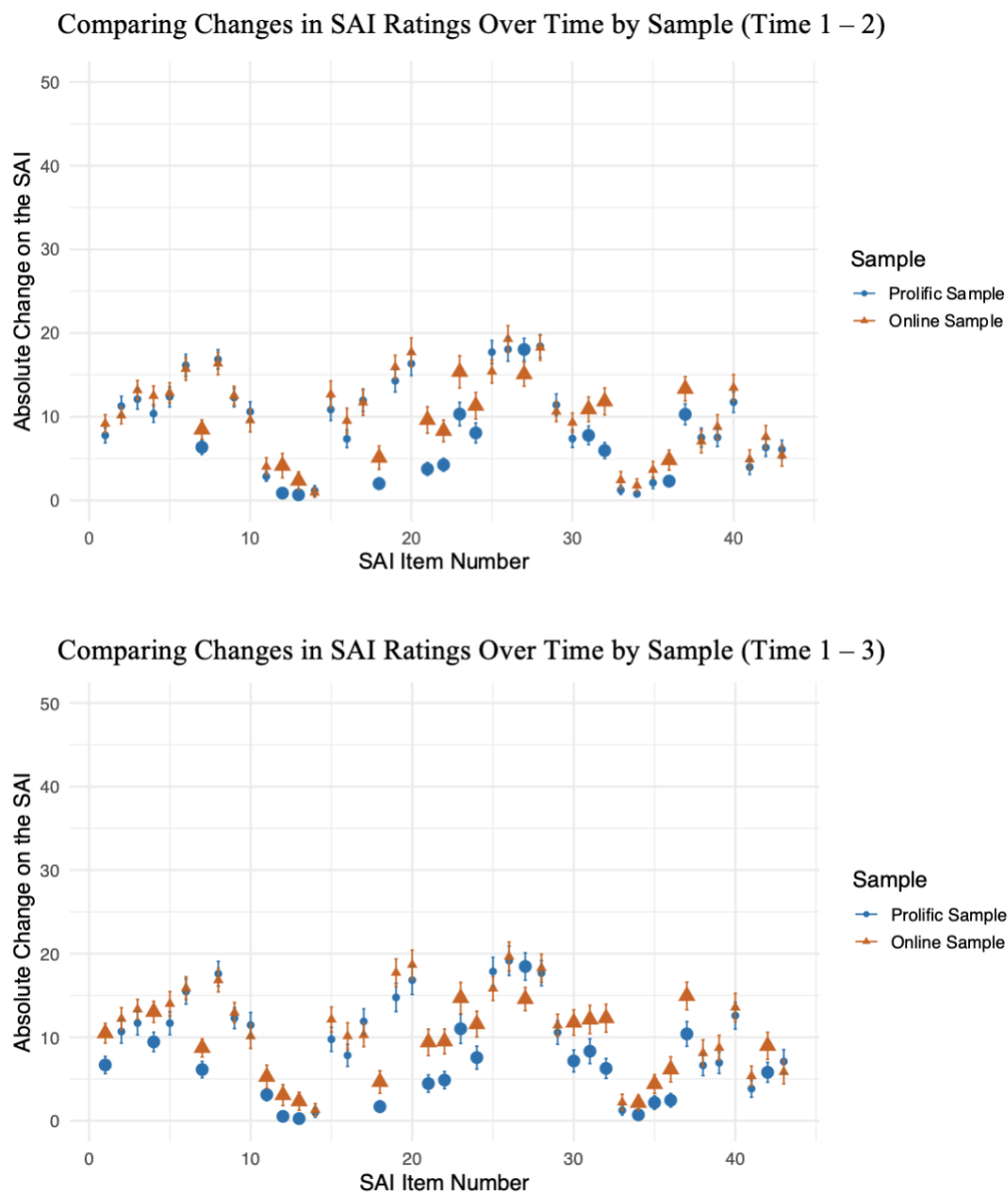
### **Results**

#### **Differences in Absolute Change by Sample**

Figure S1 shows a comparison of the absolute change in SAI items over time by sample. Both samples followed a similar pattern of change across both time comparisons (i.e., Time 1 – 2 and Time 1 – 3), with most scores overlapping within 95% confidence intervals for the two samples. Across both time comparisons, there were eight instances where the two samples differed in change; seven of which indicated greater change in the Online sample than the Prolific sample.

## Figure S1

*Mean Absolute Change Scores of Items on the SAI by Sample Type and Across both Time Comparisons.*



*Note.* The periods between Time 1 and Time 2 were 6 months, and between Time 1 and Time 3 were 12 months; for Time 1 – 2,  $n_{Prolific} = 756$ ,  $n_{Online} = 539$ ; for Time 1 – 3,  $n_{Prolific} = 539$ ,  $n_{Online}$

= 488; SAI = Sexual Attraction Inventory. The y-axis has an upper limit of 100, which was suppressed to 50 for visualization.

## **Chapter 5: General Discussion**

The goal of this dissertation was to evaluate the existence and extent of change in sexual attractions over time. I began by reviewing and analyzing the current academic literature on changes in sexual attractions. The search resulted in 24 articles, which included 15 independent samples of 11,943 participants assessed prospectively. The Kinsey scale was the most frequently used measure of sexual attraction, which is in keeping with the broad conclusion that current research on changes in sexual attraction has focused on gender-based attraction. In a pooled sample of 8,008, it was estimated that approximately 18% of participants experienced a quantifiable change in sexual attraction over a median of 20 months.

The findings from Chapter 2 informed the development of the Sexual Attraction Inventory (SAI) in Chapter 3. A sample of 670 Canadian university students was recruited to explore the psychometric properties of scores on the SAI. This study focused on convergent and divergent validity, test-retest reliability, factor structure, face validity, and the ability to detect change over six months. The SAI performed within an acceptable range across these metrics and provided novel findings related to changes in sexual attraction. To assess change, two methods were used: a novel effect size of standardized absolute differences at the group level ( $d_{wsc}$ ) and reliable change indices at the individual level. Results suggested that the SAI was a viable tool to measure changes in sexual attraction.

This dissertation then extends into Chapter 4, a large-scale international study of changes in sexual attractions to diverse stimuli over one year. This is the first study of its kind. Over one year, effect sizes of change varied based on the stimuli participants were rating (i.e., a range of .11 [“toddlers”] to .59 [“adults”]), as did the degree of individual change (i.e., a range of 1.4% of the sample changing on their sexual attraction to “children” to 20.3% changing on “spanking, beating, or whipping someone”). Group-based trajectory modelling identified patterns of change

among each item and aligned with the central conclusions of stability being common and of changes being heterogeneous. To develop future research questions, analyses of group differences by gender, sexual orientation, and age are reported.

This dissertation focused on three key research questions: (1) Based on previous research, how much change is observed in sexual attractions over time, if any (Chapter 2), (2) is the SAI a reliable and valid measure of sexual attraction (Chapter 3), and (3) what is the extent of change to diverse stimuli generally and between biographic groups (Chapter 4)? These questions are addressed and organized into a general discussion that focuses on three central findings: (1) sexual attractions change, (2) such changes can be reliably quantified using the SAI, and (3) change differs based on the stimuli and biographic factors of the rater. These findings are discussed in the context of the broader field of research on sexual attractions and then in the context of future applications to clinical psychology.

### **Sexual Attractions Change Yet Stability is Common**

A key finding across the three studies included in this program of research is that sexual attractions change over time; stability is more common. In the systematic review from Chapter 2, I reported that sexual attractions changed for almost a fifth of participants in the included studies. The psychometric evaluation study from Chapter 3 added more nuance to this finding by measuring sexual attraction to stimuli beyond men and women over six months. Reliable change in sexual attractions ranged from 27% of the sample (i.e., on items “people who present as men” and “controlling or dominating someone”) to 5% (i.e., on “pretending to rape someone”). In a larger international sample and over one year (Chapter 4), reliable change varied from 20% (“spanking, beating, or whipping someone”) to 1% (“children”). The general conclusion that I

draw from this program of research is that sexual attractions change for up to a third or fourth of people within a year, but stability is much more common.

The assertion that sexual attractions change is certainly not novel. As reported in Chapter 2, sexual orientation researchers like Diamond (2000), Katz-Wise (2015), Needham (2012), and McClintock and Herdt (1996) have documented and discussed changes in people's sexual attraction to the gender of others. In the study of paraphilia, researchers like Money (1984), Krueger and Kaplan (2001), and Seto (2009) have hypothesized about and discussed changes in atypical sexual attractions and interests. My findings integrate and contribute to both areas of research. For example, measuring changes in sexual attractions to genders, ages, and paraphilic targets/acts allows for comparison among them. In Chapter 4, participants experienced *greater* change in stimuli related to BDSM (e.g., "spanking, beating, or whipping someone") than to men or women. These are novel comparative findings that support the claim that sexual attractions change while also sparking new and interesting research questions. For example, Diamond et al. (2020) introduced four types of sexual fluidity. It would be interesting for future researchers to evaluate if these types replicate across diverse sexual attractions within the same participants.

As discussed in Chapter 2, researchers predominantly conceptualize and measure sexual attraction toward genders. Yet, people in the samples of this dissertation were more attracted to, and experienced greater change in, targets/acts other than gender. This finding has implications for the specificity of the conclusions that researchers make about sexual attraction, broadly, when only measuring gender-based sexual attractions. It also raises an interesting question: Should gender-based sexual attractions be the standard for measuring sexual attraction, or would a chronophilic approach be more informative to understand the phenomenology of this

construct? The construct validity of sexual attraction, as it is currently measured and studied, could be improved by shifting to studying diverse stimuli, certainly those related to age.

A degree of change in sexual attraction was documented in some participants on all targets/acts in the SAI. Still, as observed in Chapters 3 and 4, stability was more common than change. Most participants did not vary much over time or changed in small increments (i.e., < 10/100). While much of this dissertation focused on measuring change and describing trajectories of change, it is relevant to discuss research on stability, given that most participants did not change over time.

Abé's (2025) sexual priors framework can be used to model and understand stability in sexual attractions. This framework is not explicitly about change in sexual attractions but rather about how cognitive evaluations of sexual attraction are made. The core aspects of Abé's model involve the influence of innate factors, learned/conditioned factors, and memory retrieval. With these components in mind, stability would be a reasonable outcome for someone who continues to have the same experience with the same stimulus over time; their sexual priors would largely remain the same and produce the same sexual attraction. It would be interesting to longitudinally evaluate whether sexual experience with a specific stimulus and memory processes correspond to stability in sexual attraction to that particular stimulus.

Diamond et al. (2017) conceptualize stability in sexual attraction using dynamic systems modelling (Butner et al., 2015). Here, stability is defined as the degree to which fluctuations consistently "self-correct" to a specific homeostatic setpoint (Diamond et al., 2017; p. 195). In their study of day-to-day attractions, Diamond et al. reported varying patterns of stability based on gender and sexual orientation; women and bisexual participants showed lower stability than comparison groups. The findings from the present dissertation expand on this by finding varying

patterns of sexual stability between men and women based on gender. Our results align with Diamond and colleagues' (2017) finding that bisexual participants experienced lower stability than other sexual orientations.

The data included in this dissertation can be interpreted in several ways depending on whether one is trying to quantify the degree of change or the presence of stability, in the traditional sense (i.e., lack of change). However, as discussed, stability can also be conceptualized in the context of dynamic systems modeling (i.e., self-correcting return to a set point). This modeling accounts for multiple “types” of change and trajectories of change with time. Therefore, it is interesting to compare the data in this dissertation with the three key criteria of such modelling: nonlinear change with time, spontaneous emergence of new forms, and periodic reorganizations and phase transitions.

First, nonlinear change was documented in the variability of change scores from Chapter 2 (varying widely from 11% to 87%; Diamond, 2008; Jones & Yarhouse, 2011; Katz-Wise et al., 2017), as well as varied patterns of absolute change and trajectories across stimuli over multiple periods in Chapters 3 and 4. Second, the emergence of novel forms in sexual attraction was observed in both Chapters 3 and 4, where some participants with initially low or no attraction (<10/100) developed new degrees of sexual attraction (above 30/100) with time. As seen in Figure 5 of Chapter 4, a subset of participants experienced little or no attraction at baseline to “toddlers”, “touching an object like shoes, gloves, or plush toys”, or “defecating on someone”, but later experienced moderate to high degrees of attraction on follow-up. Third, other trajectories from Figure 5 of Chapter 4 (i.e., for “making obscene phone calls to someone who is not expecting it” or “defecating on someone”) show a subset of participants who jumped from one form (or “basin” as Diamond discusses; 2007), disrupting the previous form at the six-month

period, but then returning to this form at the one-year period. This provides some support for the concept of periodic reorganization; however, this evidence is limited in that we did not conduct further assessment to determine stability after the one-year period. Overall, the findings of this dissertation align with the concept of dynamic systems modelling, but only for subsets of participants. Stability and “basin-settling” were more common. Theories of change in sexual attraction must continue to contend with the finding that stability is more common.

### **The SAI Can Assess Changes in Sexual Attractions**

A second key finding of this dissertation is that the SAI performed satisfactorily in reliably measuring sexual attractions. The SAI also builds upon previous measures by including a preamble to orient participants to what they are rating, adding more response options, and a broader range of targets/acts to rate. To qualify this second finding, it is helpful to compare the history of measuring sexual attraction to general trends in psychometry more broadly.

As discussed by Strauss and Smith (2009), the history of measure development, particularly in clinical psychology, is typically characterized by an initial interest in screening and sorting individuals into discrete groups, as was done in the Woodworth Personal Data Sheet (WPDS) study of 1919. This was an early measure validation study in clinical psychology that sought to screen American soldiers for vulnerability to “shell shock”. The WPDS included questions that technically worked in sorting soldiers but had low specificity and a high degree of false positives. For example, one of the items asked, “Have you ever lost your memory for a time?”, which could apply to many conditions other than “shell shock”, but was true of some of those who indeed did experience this phenomenon.

The history of measuring sexual attractions begins with a similar framework as the WPDS and is often associated with the work of Alfred Kinsey (Kinsey et al., 1948). Despite

having a 7-point scale, Kinsey's original "heterosexual-homosexual rating scale" was developed to sort people into one of three groups: heterosexual, bisexual, or homosexual. This work was critiqued on its restrictive approach by both Fritz Klein (e.g., Klein et al., 1985) and Michael Storms (e.g., Storms, 1980). These two researchers created their multi-construct scales to measure other components of sexual orientation that sought to describe a person with more than three labels. Klein specifically included a subscale of sexual attraction within his grid-like measure. However, all three of these researchers restricted their conceptualization of sexual attraction to gender and within the broader study of sexual orientation.

Just as our measures of trauma-related disorders (i.e., "shell shock") have developed to have greater construct validity and precision (e.g., Hargadon & Holden, 2021), so too should our measures of sexual attraction. In their essay on current knowledge gaps in sexual fluidity research, Coulaud et al. (2024) make the specific recommendation for future researchers to develop measures of sexual attraction (also identity, behaviour, and orientation) with greater precision than existing options like the Kinsey scale. The findings of this dissertation add to the progression of measuring sexual attraction with the development of the SAI.

The SAI performed similarly to the Kinsey scale in a sample of university students, demonstrated expected test-retest reliability over two weeks, measured changes in sexual attraction to diverse targets/acts, and was well experienced by participants (e.g., in terms of acceptability, effectiveness, and clarity). However, future research should explore the suggested (and observed) 10/100 reliability cut-off suggested in Chapter 3. It would be interesting to replicate this finding and explore whether participants who experienced changes below 10/100 would also self-report that they feel they changed, or whether they perceived themselves as

stable. This could help inform whether the 10/100 cut-off is valid in its inference that changes below this are not “true” or reliable change.

### **Changes in Sexual Attractions Differ Based on Stimulus and Biographic Factors**

A third contribution of this dissertation is the finding that the extent of change in sexual attractions varies by both the target/act rated and biographic factors of the rater. In this dissertation, participants changed differently based on the targets/acts rated; different trajectories of change were documented for each of the items on the SAI. Differences in mean scores were also observed between genders, ages, and sexual orientations.

One of the types of sexual fluidity discussed by Diamond et al. (2020) pertains to fluidity as a heightened sensitivity to context. Diamond et al. discuss this with an example of women responding differently to less preferred stimuli in the laboratory context versus everyday life. Suppose one considers stimulus characteristics (e.g., whether an unsuspecting stranger is undressing in a window, the plushness of a stuffed toy, the shape of a partner’s genitals) and biographic factors (e.g., the gender or age of the person making the rating) as “context” in the process of someone evaluating their sexual attraction. In that case, these findings align with Diamond’s (2016) hypothesis that sexual fluidity, or the capacity for change in sexual attraction, is dependent on context. Diamond’s reference to context-dependency mainly pertained to two factors: the environment where a person was sexually responding and the relationship between them and the person they were sexually responding to. The findings within this dissertation add to this by highlighting the likely influence of a person’s biographic makeup and the qualities of the targets/acts they are evaluating.

One of the most interesting findings of biographic influences on changes in sexual attractions was that the amount of total absolute change over one year was nearly the same

between men and women. However, men and women changed on different items; men changed most on paraphilic items (e.g., “younger adolescents”, “verbally humiliating someone”, “touching or rubbing a stranger who is not expecting it”, “pretending to rape someone”) while women changed most on normophilic ones (e.g., “masculinity”/“femininity”, “having sex with an adult man [woman]”, “young adults”). As observed in the group-based trajectory panels in Chapter 4, women still sometimes changed in discrete ways in their attraction to paraphilic stimuli, but the change in these stimuli was mostly experienced by men in terms of relative magnitude.

This gender-based result is comparable to a common finding in paraphilia research; paraphilic sexual interest, attraction, arousal, and behaviour are far more commonly observed in men than women (Dawson et al., 2016; Castellini et al., 2018; Levaque et al., 2022). The results of this program of research help develop new hypotheses and questions relevant to paraphilia researchers. For example, perhaps it is some aspect of the change process or capacity to change that promotes paraphilic sexual attraction in men. It might also be hypothesized that changes in atypical sexual attractions correlate with changes in exploring even more novel and atypical sexual behaviours, which, if they result in a positive experience (i.e., orgasm), might condition greater paraphilic sexual interest in general. Lastly, it would be important for future researchers to replicate the findings of the present research with a focus on sex drive, which has been demonstrated to mediate gender differences in paraphilic sexual interests in cross-sectional designs (i.e., Dawson et al., 2016; Castellini et al., 2018; Levaque et al., 2022). It would be interesting to evaluate whether changes in sex drive explain some of the variance in gender differences in changes in sexual attractions.

Evaluating novel hypotheses of gender differences in sexual attractions should also consider gender invariance when interpreting the results of the SAI. Seto et al. (2025) demonstrated evidence of configural but not scalar invariance among men and women when using the Paraphilia Scale, which measures both arousal and disgust to many of the same stimuli as the SAI. Gender differences in self-reports and genital measures of sexual arousal are well-documented (e.g., Chivers et al., 2010). Recently, Keinan-Bar et al. (2025) also documented gender differences in the specificity of responses on self-report measures of gender-based sexual attraction. They reported that men consistently reported greater sexual attraction to their preferred gender than women did. To my knowledge, researchers have yet to evaluate gender invariance for self-report measures of sexual attraction, specifically, to targets beyond gender. A logical extension of my program of research would be to compare how people of diverse genders interpret sexual attraction to each of the items on the SAI. This data would add to my interpretations of gender differences among items in the SAI and provide context to the finding that, across all items on the SAI, overall absolute change between men and women was nearly identical in terms of the units of change (but not in terms of which items men and women changed on most).

Beyond gender, this program of research also included interesting results regarding the influence of sexual orientation and age on changes in sexual attractions. The former aligned with my hypothesis and that of previous research (e.g., Diamond et al., 2017); bisexual participants experienced greater overall absolute change than heterosexual or homosexual participants, and plurisexual participants changed on more stimuli than monosexual participants. The latter was a novel finding and did not align with my hypothesis; overall absolute change did not change much with age. While these findings are discussed in Chapter 4, it would be valuable for future

researchers to replicate them and explore each biographic influence further. Notably, it would be important to evaluate if (or how much) diverse sexual attractions change alongside changes in self-reported sexual orientation or sexual identity labels. For age, measuring changes on a longer-term scale (e.g., 10 years, like in Diamond's studies, but with diverse stimuli; Diamond, 2000) might provide a more granular understanding of the influence of age on the overall change experienced by a person with time.

Variability in change based on stimulus- and biographic factors can be explained with Abé's (2025) recently proposed sexual priors theory. For example, when examining sexual attraction to children in Chapter 4, most people experienced "no attraction, no change," while a small portion of participants experienced varied attraction and change patterns. A parsimonious explanation for these results is that, because this was a low base-rate item (see discussion in Chapter 3), participants may not have provided reliable responses. However, it could also be hypothesized that people are generally likely to have fewer sexual priors related to children, as this attraction draws social stigma (Roche et al., 2024) and could be associated with behaviours that infringe upon specific laws (Seto, 2008). These innate and learned conditions would produce fewer sexual priors and lower or less frequent evaluations of sexual attraction to children. However, those who are sexually attracted to children (which, using pedophilia as a proxy, is relatively rare with estimates around 1%; Seto, 2009; 2017) would likely seek out exposure to this target, to varying degrees/success, and develop a greater wealth of priors that would then produce more varied trajectories of change in a small group of people, as was demonstrated in Figure 5 of Chapter 4.

Alternatively, consider sexual attraction to acts such as "controlling or dominating someone" or "spanking, beating, or whipping someone". These are acts associated with BDSM,

a cluster of sexual concepts that are also associated with a degree of social stigma and neurobiological factors (De Neef et al., 2019). However, BDSM-related interest, fantasy, and public narratives have become increasingly prevalent with more media representation and research into this cluster of constructs (e.g., Brown et al., 2020; Larva & Rantala, 2024). With greater social acceptance and exposure in the present day, people are likely to build a greater wealth of sexual priors related to BDSM than ever before. So much so that researchers now discuss the de-pathologizing of BDSM with changes made to diagnostic criteria and clarifications made about how to separate pathological behaviours from increasingly normative interest (Dunkley & Brotto, 2018). In line with sexual priors theory, these shifts in the sociology of BDSM would likely produce an increasing number of sexual priors. It can therefore be hypothesized that the de-pathologizing and increased positive media representations of BDSM increase people's sexual attraction to these targets/acts and create greater absolute change over time as people variably engage with updated (and more frequently experienced) sexual priors.

Overall, the finding that changes in sexual attraction vary by stimulus, gender, age, and sexual orientation suggests that change is specific rather than generalized. This aligns with Diamond's existing hypotheses of sexual fluidity being context-dependent, referential to the target, and multitype. The findings from this dissertation extend these hypotheses by exploring change in diverse targets/acts and replicating general sexual fluidity findings in multiple samples with the SAI.

### **Future Directions in the Application of Findings to Theory**

The findings of this dissertation have implications for future directions in research that might help develop theories of sexual attraction and fluidity. The first research question of this dissertation was: Based on previous research, how much change is observed in sexual attractions

over time? As discussed in Chapter 2, it was challenging to address this question given the scarcity of individual-level data reported. It could be useful for future research to adopt open-science practices to make individual-level data more accessible (see Crüwell et al., 2019).

Additionally, one of the key findings of Chapter 2 was that researchers of the included studies had exclusively studied changes in gender-based sexual attractions. Therefore, and as discussed, it is recommended that future researchers use the SAI or expand their measures of sexual attraction to include more diverse targets/acts. This data would be helpful to assess the replicability of the findings of Chapter 4 and expand current theories of sexual fluidity (e.g., Diamond, 2016).

The second research question, addressed in Chapter 3, asked whether the SAI was a reliable and valid measure of sexual attraction. While we report psychometric evidence in favour of the SAI being reliable, it would be important for future research to conduct comparative studies of the SAI alongside other direct (e.g., self-report measures such as the KSOG) and indirect (e.g., Implicit Association Tasks; IATs, plethysmography, eye-tracking) measures. Keinan-Bar et al. (2024) compared multiple types of sexual attraction IATs with a sexual attraction sequential priming task (a task where participants categorize stimuli, and their reaction times are recorded) with a large sample of mostly American participants ( $n = 50,535$ ). Their goal was to identify the most valid and reliable indirect measure of gender-based sexual attraction (i.e., to men and women). This type of comparative study could be improved by integrating findings from the present dissertation. For example, including more diverse stimuli and comparing indirect measures along with self-report ones, such as the SAI, would improve general knowledge of which method produces the most valid and reliable data on sexual attraction. This would assist future researchers in studying changes in sexual attraction and

refining theories of why such changes might occur.

Thirdly, Chapter 4 addresses the question of the extent of change to diverse stimuli generally and between biographic groups. Findings indicate that stability is more common, but sexual attractions change differently based on the target/act assessed and the gender (similar overall change for men and women but across different items and somewhat greater change among gender-diverse participants), age (some differences between age groups but overall comparable results with age), and sexual orientation (greater change among mostly homosexual/questioning and bisexual participants) of the rater. Beyond just replicating these findings, it would be important for future research to evaluate potential mediating or moderating factors between biographic groups and interactions between biographic variables.

For a more comprehensive investigation, future researchers should adopt a biopsychosocial approach to exploring biographic differences in changes in sexual attractions. For example, as discussed in Chapter 1, it could be hypothesized that differences in dopamine (e.g., Acevedo & Aron, 2014) or kisspeptin (e.g., Yang et al., 2020) pathways mediate sex- or gender-based differences in sexual attraction. Perhaps generational differences in societal attitudes toward ageism and sexuality would influence our finding that overall changes in sexual attractions did not change much with age (Syme & Cohn, 2016). Furthermore, maybe there are different cognitive processes involved in the self-perception and identity-labels used by plurisexual versus monosexual individuals that might moderate changes in sexual attractions based on sexual orientation. These are all examples of questions that future researchers should investigate by expanding on the findings of the present dissertation and integrating biopsychosocial hypotheses of changes in sexual attractions.

An interesting avenue for researchers to take when studying changes in sexual attractions

would be to explore the potential role of interpersonal dynamics. Attraction to extradyadic partners may compromise the quality of the relationship between romantic partners (Belu & O’Sullivan, 2025). Sexual attractions also exist between platonic friends and might mediate the difference between “liking” and “loving” a friend (Kaplan & Keys, 1997). Measuring changes in diverse sexual attractions over time alongside relationship variables (e.g., number of sexual/romantic partners, length of relationship, relationship quality, dyadic sexual behaviour patterns and frequency, friendship dynamics) could expand current knowledge of how influential sexual attractions are within interpersonal relationships (and vice-versa).

### **Future Directions in the Application of Findings to Clinical Psychology**

Beyond discussions of theory, this dissertation may generate new avenues for working with sexual attraction in clinical settings. Accordingly, there are three domains where future applications and extensions of this work may be relevant: public health, psychotherapy, and professional practice and ethics.

#### ***Future Applications to Public Health***

Public health has a vested interest in better understanding and measuring predictors of health-related outcomes. Sexual attraction has been used as a predictor of psychosocial health and well-being in previous cross-sectional research and has better predicted outcomes (e.g., depressive symptoms, anxiety, self-esteem) than other sexuality-related metrics (e.g., sexual identity; Johns et al., 2012). From reviewing data from the National Survey on Drug Use and Health, Garbarski (2021) found that asking participants about sexual attraction provided more information about how their sexual identity predicted mental health outcomes (e.g., depressive episode, suicidal ideation, suicidal plan/attempts as measured using data from the Kessler-6; Kessler et al., 2002). Needham (2012) conducted similar analyses using a longitudinal design

and reported that varied patterns of change in gender-based *romantic* attraction were related to different patterns of self-reported mental health and substance use. There has yet to be a study investigating changes in diverse *sexual* attractions and mental health outcomes; however, results from Garbarski and Needham are suggestive of an association between the two.

Knowing more about changes in people's sexual attractions can help public health researchers and agencies better predict psychosocial health-related outcomes. This type of longitudinal data could provide novel inferences about links between sexuality and mental health. Future researchers could use the SAI with targeted clinical populations to evaluate potential associations between psychological distress or well-being and changes in sexual attractions.

### ***Future Applications to Psychotherapy***

Clinically, this research may, in future developments, assist health care professionals to better understand their clients' sexual attractions. People can, and do, present to psychotherapy for concerns related to changes in their sexual attractions. Yet, clinicians lack the tools to define, measure, and track these attractions (see review by Przeworski et al., 2021). For example, in narrative sexual identity therapy, clinicians help clients make sense and meaning of their sexual attractions so that they may form a better understanding and acceptance of their sexual identity (Yarhouse, 2008). This therapy is built to help people understand past and current sexual attractions but is not informed by research related to changes in sexual attractions. The finding that overall absolute change in sexual attractions does not vary much with age may be informative for those seeking support for distress related to what their sexual attractions and potential changes "mean". The present dissertation may inform future research by providing a measure of diverse sexual attraction that can be used over time and can be mapped using

trajectory modelling. This type of data can be valuable for clinicians seeking to know more about how clients' sexual attractions change (or do not) to inform treatment targets. Future researchers should explore the feasibility of the SAI as a monitoring tool for tracking and describing changes in sexual attraction relevant to clinical targets in psychotherapy.

The current research on changes in sexual attractions in clinical settings is often focused on conversion therapy or Sexual Attraction Fluidity Exploration in Therapy (SAFE-T; Pela & Sutton, 2021). The current body of literature is divided in terms of the benefits and harm of these therapeutic approaches (Andrade & Redondo, 2022; Haldeman, 1994). The American Psychological Association (APA), on one side of this argument, reports that there is little research and evidence to assert that SAFE-T does not result in considerable harm to the client (e.g., non-maleficence; APA, 2009). The APA and researchers globally (e.g., Ogunbajo et al., 2022) cite numerous negative psychosocial outcomes associated with conversion- and related therapies. Alternatively, proponents of SAFE-T draw on data that often comes from samples who typically self-refer to therapy to change their sexual attractions and orientation so that they may pursue religious beliefs or traditional heterosexual marriages (as per Pela & Sutton, 2021).

There is a significant need to clarify the psychotherapeutic approach that may support people concerned about their changes in sexual attractions in empirically sound and ethical ways. Future researchers may glean findings from the present study to better measure such changes. This data can contribute to future understandings of what distinguishes natural changes in sexual attraction from effortful changes, if such types exist. However, significant development in studying changes in sexual attractions in clinical settings would be needed before interventions could be appropriately evaluated.

### *Future Applications to Professional Practice and Ethical Guidelines*

Another clinical application that has emerged from the study of sexual attraction is the focus on how therapists manage sexual attractions to clients. Between 1980 and 2000, there was an emergent academic focus on understanding how sexual attraction, interest, and arousal influence the relationships between clients and their therapists (Pope & Vasquez, 2016). During this period, there was a rise in the proportion of ethics complaints and malpractice lawsuits lodged against American psychologists related to therapist-client sexual contact (Pope & Vasquez, 2016). Consequently, an entire field of research became focused on studying sexual attraction between therapists and their clients.

With regulations and rules in place to protect clients, therapists still experience sexual attractions, and as reviewed in Chapter 1, a small portion act upon these attractions. The research here has primarily focused on whether individuals are or are not attracted to their clients, with some emphasis on how to support therapists and prevent them from acting on these attractions (e.g., through supervision; Jacob et al., 2022). Being able to track the degree of attraction and change over time, with an approach that borrows from or uses a measure such as the SAI (with novel items added and psychometrically evaluated), could provide new insights into the development of client-therapist sexual attraction. This type of research could borrow from how the SAI was developed but would involve the use of evaluating specific stimuli (i.e., a specific client that a therapist is reporting sexual attraction towards). It is recommended that future researchers evaluate the use of the SAI for measuring specific stimuli rather than general ones as was done in the current program of research. Future extensions of this could investigate factors that both promote and extinguish such attractions to inform policies and procedures for therapists to take when experiencing sexual attraction to their clients.

## **Conclusion**

The primary goal of this dissertation was to evaluate the extent of changes in sexual attractions over time. This goal was achieved by systematically reviewing the literature, developing and psychometrically evaluating a novel measure, and collecting data using this measure from a large international sample over a one-year period. The results inform current theories and hypotheses of changes in sexual attraction and sexual fluidity. This discussion concludes with a review of future theoretical and clinical applications to support people who may present with concerns regarding changes in their sexual attractions. Sexual attraction is an important component of the human sexual experience that sometimes changes, in various ways, with time. Measuring such changes is an essential step to further understanding the etiology and phenomenology of sexual attraction, and how this construct links to other aspects of sexuality and well-being generally.

## References

- Abé, C. (2025). The concept of innate sexual priors in the brain: A theory on why we are attracted to what we are attracted to. *Sexuality & Culture, 29*, 636–666.  
<https://doi.org/10.1007/s12119-024-10290-4>
- Acevedo, B. P., & Aron, A. P. (2014). Romantic love, pair-bonding, and the dopaminergic reward system. In M. Mikulincer & P. R. Shaver (Eds.), *Mechanisms of social connection: From brain to group* (pp. 55–69). American Psychological Association.
- American Psychological Association, Task Force on Appropriate Therapeutic Responses to Sexual Orientation. (2009). *Report of the American Psychological Association Task Force on Appropriate Therapeutic Responses to Sexual Orientation*.  
<http://www.apa.org/pi/lgbc/publications/therapeutic-resp.html>
- Andrade, G., & Redondo, M. C. (2022). Is conversion therapy ethical? A renewed discussion in the context of legal efforts to ban it. *Ethics, Medicine and Public Health, 20*, 100732.  
<https://doi.org/10.1016/j.jemep.2022.100732>
- Belu, C. F., & O’Sullivan, L. F. (2025). It’s just a little crush: Attraction to an alternative and romantic relationship quality, breakups and infidelity. *Journal of Sex Research, 62*(4), 515–528. <https://doi.org/10.1080/00224499.2025.xxxxx>
- Brown, A., Barker, E. D., & Rahman, Q. (2020). A systematic scoping review of the prevalence, etiological, psychological, and interpersonal factors associated with BDSM. *Journal of Sex Research, 57*, 781–811. <https://doi.org/10.1080/00224499.2020.1726454>
- Butner, J. E., Gagnon, K. T., Geuss, M. N., Lessard, D. A., & Story, T. N. (2015). Utilizing topology to generate and test theories of change. *Psychological Methods, 20*, 1–17.  
<https://doi.org/10.1037/met0000032>

- Castellini, G., Rellini, A. H., Appignanesi, C., Pinucci, I., Fattorini, M., Grano, E., ... Ricca, V. (2018). Deviance or normalcy? The relationship among paraphilic thoughts and behaviors, hypersexuality, and psychopathology in a sample of university students. *Journal of Sexual Medicine, 15*, 1322–1335. <https://doi.org/10.1016/j.jsxm.2018.05.010>
- Chivers, M. L., Seto, M. C., Lalumière, M. L., Laan, E., & Grimbos, T. (2010). Agreement of self-reported and genital measures of sexual arousal in men and women: A meta-analysis. *Archives of sexual behavior, 39*, 5-56. <https://doi.org/10.1007/s10508-009-9556-9>
- Coulaud, P. J., Salway, T., Adams, N., Ball, W., Larmarange, J., Kelly-Irving, M., & Knight, R. (2024). Knowledge gaps in existing research exploring sexual fluidity and mental health among young adults. *Journal of Epidemiology and Community Health, 78*, 556–560. <https://doi.org/10.1136/jech-2023-221234>
- Crüwell, S., van Doorn, J., Etz, A., Makel, M. C., Moshontz, H., Niebaum, J. C., ... Schulte-Mecklenbeck, M. (2019). Seven easy steps to open science. *Zeitschrift für Psychologie, 227*, 237–248. <https://doi.org/10.1027/2151-2604/a000386>
- Dawson, S. J., Bannerman, B. A., & Lalumière, M. L. (2016). Paraphilic interests: An examination of sex differences in a nonclinical sample. *Sexual Abuse, 28*, 20–45. <https://doi.org/10.1177/1079063214558670>
- De Neef, N., Coppens, V., Huys, W., & Morrens, M. (2019). Bondage-discipline, dominance-submission and sadomasochism (BDSM) from an integrative biopsychosocial perspective: A systematic review. *Sexual Medicine, 7*, 129–144. <https://doi.org/10.1016/j.esxm.2019.02.002>

- Diamond, L. M. (2000). Sexual identity, attractions, and behavior among young sexual-minority women over a 2-year period. *Developmental Psychology*, *36*, 241–250.  
<https://doi.org/10.1037/0012-1649.36.2.241>
- Diamond, L. M. (2007). A dynamical systems approach to the development and expression of female same-sex sexuality. *Perspectives on Psychological Science*, *2*, 142–161.  
<https://doi.org/10.1111/j.1745-6916.2007.00036.x>
- Diamond, L. M. (2008). Female bisexuality from adolescence to adulthood: Results from a 10-year longitudinal study. *Developmental Psychology*, *44*, 5–14.  
<https://doi.org/10.1037/0012-1649.44.1.5>
- Diamond, L. M. (2016). Sexual fluidity in male and females. *Current Sexual Health Reports*, *8*, 249–256. <https://doi.org/10.1007/s11930-016-0092-z>
- Diamond, L. M., Alley, J., Dickenson, J., & Blair, K. L. (2020). Who counts as sexually fluid? Comparing four different types of sexual fluidity in women. *Archives of Sexual Behaviour*, *49*, 2389–2403. <https://doi.org/10.1007/s10508-019-01565-1>
- Diamond, L. M., Dickenson, J. A., & Blair, K. L. (2017). Stability of sexual attractions across different timescales: The roles of bisexuality and gender. *Archives of Sexual Behaviour*, *46*, 193–204. <https://doi.org/10.1007/s10508-016-0860-x>
- Dunkley, C. R., & Brotto, L. A. (2018). Clinical considerations in treating BDSM practitioners: A review. *Journal of Sex & Marital Therapy*, *44*, 701–712.  
<https://doi.org/10.1080/0092623X.2017.1420964>
- Garbarski, D. (2021). The survey measurement of sexual orientation: Configurations of sexual identity and attraction and associations with mental health. *LGBT Health*, *8*, 307–315.  
<https://doi.org/10.1089/lgbt.2020.0366>

Haldeman, D. C. (1994). The practice and ethics of sexual orientation conversion therapy.

*Journal of Consulting and Clinical Psychology, 62*, 221–227.

<https://doi.org/10.1037/0022-006X.62.2.221>

Hargadon, D. P., & Holden, R. R. (2021). The Woodworth Psychoneurotic Inventory: After

more than a century, what does it measure? *Personality and Individual Differences, 174*,

110690. <https://doi.org/10.1016/j.paid.2021.110690>

Jacob, C. J., Byrd, R., Donald, E. J., Milner, R. J., & Flowers, T. (2022). Avoiding boundary

violations: Recommendations for managing attraction to and from clients in response to

the Healthcare Providers Service Organization's 2019 report. *Journal of Mental Health*

*Counseling, 44*, 6–17. <https://doi.org/10.17744/mehc.44.1.01>

Johns, M. M., Zimmerman, M., & Bauermeister, J. A. (2013). Sexual attraction, sexual identity,

and psychosocial wellbeing in a national sample of young women during emerging

adulthood. *Journal of Youth and Adolescence, 42*, 82–95. [https://doi.org/10.1007/s10964-](https://doi.org/10.1007/s10964-012-9813-5)

[012-9813-5](https://doi.org/10.1007/s10964-012-9813-5)

Jones, S. L., & Yarhouse, M. A. (2011). A longitudinal study of attempted religiously mediated

sexual orientation change. *Journal of Sex & Marital Therapy, 37*, 404–427.

<https://doi.org/10.1080/0092623X.2011.607052>

Kaplan, D. L., & Keys, C. B. (1997). Sex and relationship variables as predictors of sexual

attraction in cross-sex platonic friendships between young heterosexual adults. *Journal of*

*Social and Personal Relationships, 14*, 191–206.

<https://doi.org/10.1177/0265407597142003>

- Katz-Wise, S. L. (2015). Sexual fluidity in young adult women and men: Associations with sexual orientation and sexual identity development. *Psychology & Sexuality, 6*, 189–200. <https://doi.org/10.1080/19419899.2013.876445>
- Katz-Wise, S. L., Williams, D. N., Keo-Meier, C. L., Budge, S. L., Pardo, S., & Sharp, C. (2017). Longitudinal associations of sexual fluidity and health in transgender men and cisgender women and men. *Psychology of Sexual Orientation and Gender Diversity, 4*, 460–472. <https://doi.org/10.1037/sgd0000248>
- Keinan-Bar, S., Joel, D., & Bar-Anan, Y. (2024). A comparative investigation of indirect measures of sexual attraction. *Collabra: Psychology, 10*, 1–17. <https://doi.org/10.1525/collabra.67734>
- Kessler, R. C., Andrews, G., Colpe, L. J., Hiripi, E., Mroczek, D. K., Normand, S. S., Walters, E. E., & Zaslavsky, A. M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine, 32*, 959–976. <https://doi.org/10.1017/S0033291702006074>
- Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. W. B. Saunders.
- Klein, F., Sepekoff, B., & Wolf, T. J. (1985). Sexual orientation: A multi-variable dynamic process. *Journal of Homosexuality, 11*, 35–49. [https://doi.org/10.1300/J082v11n01\\_03](https://doi.org/10.1300/J082v11n01_03)
- Krueger, R. B., & Kaplan, M. S. (2001). The paraphilic and hypersexual disorders: An overview. *Journal of Psychiatric Practice, 7*, 391–403. <https://doi.org/10.1097/00131746-200111000-00008>

- Larva, M. A., & Rantala, M. J. (2024). An evolutionary psychological approach toward BDSM interest and behavior. *Archives of Sexual Behaviour*, *53*, 2253–2267.  
<https://doi.org/10.1007/s10508-024-02881-x>
- Levaque, E., Dawson, S. J., Wan, C., & Lalumière, M. L. (2022). Sex drive as a possible mediator of the gender difference in the prevalence of paraphilic interests in a nonclinical sample. *Archives of Sexual Behavior*, *51*, 867–877. <https://doi.org/10.1007/s10508-021-02060-7>
- McClintock, M. K., & Herdt, G. (1996). Rethinking puberty: The development of sexual attraction. *Current Directions in Psychological Science*, *5*, 178–183.  
<https://doi.org/10.1111/1467-8721.ep11512422>
- Money, J. (1984). Paraphilias: Phenomenology and classification. *American Journal of Psychotherapy*, *38*, 164–179. <https://doi.org/10.1176/appi.psychotherapy.1984.38.2.164>
- Needham, B. L. (2012). Sexual attraction and trajectories of mental health and substance use during the transition from adolescence to adulthood. *Journal of Youth and Adolescence*, *41*, 179–190. <https://doi.org/10.1007/s10964-011-9704-x>
- Ogunbajo, A., Oke, T., Okanlawon, K., Abubakari, G. M. R., & Oginni, O. (2022). Religiosity and conversion therapy is associated with psychosocial health problems among sexual minority men (SMM) in Nigeria. *Journal of Religion and Health*, *61*, 3098–3128.  
<https://doi.org/10.1007/s10943-022-01591-9>
- Pela, C., & Sutton, P. (2021). Sexual attraction fluidity and well-being in men: A therapeutic outcome study. *Journal of Human Sexuality*, *12*, 61–86. <https://doi.org/10.1080/xxx>
- Pope, K. S., & Vasquez, M. J. (2016). *Ethics in psychotherapy and counseling: A practical guide*. John Wiley & Sons.

- Przeworski, A., Peterson, E., & Piedra, A. (2021). A systematic review of the efficacy, harmful effects, and ethical issues related to sexual orientation change efforts. *Clinical Psychology: Science and Practice*, 28, 81–102. <https://doi.org/10.1111/cpsp.12309>
- Roche, K., Pagacz, J., Lalumière, M. L., & Seto, M. C. (2025). Public perceptions of individuals attracted to children: The impact of the person's gender, child gender, and preferentiality on stigma and perceived risk to offend. *Sexual Abuse*, 37, 723–755. <https://doi.org/10.1177/10790632231234567>
- Seto, M. C. (2008). *Pedophilia and sexual offending against children* (pp. VII). American Psychological Association.
- Seto, M. C. (2009). Pedophilia. *Annual Review of Clinical Psychology*, 5, 391–407. <https://doi.org/10.1146/annurev.clinpsy.032408.153618>
- Seto, M. C. (2017). The puzzle of male chronophilias. *Archives of Sexual Behaviour*, 46, 3–22. <https://doi.org/10.1007/s10508-016-0900-2>
- Seto, M. C., Leroux, E. J., Kane, L., Ashbaugh, A. R., Lalumière, M. L., Curry, S., Stephens, S., & Chivers, M. L. (2025). Does the paraphilia scale work for everyone? Confirmatory factor analysis and measurement invariance across gender and sexual orientation groups. *Journal of Sex Research*, 62, 411–420. <https://doi.org/10.1080/00224499.2024.2353303>
- Strauss, M. E., & Smith, G. T. (2009). Construct validity: Advances in theory and methodology. *Annual Review of Clinical Psychology*, 5, 1–25. <https://doi.org/10.1146/annurev.clinpsy.032408.153635>
- Storms, M. D. (1980). Theories of sexual orientation. *Journal of Personality and Social Psychology*, 38, 783–792. <https://doi.org/10.1037/0022-3514.38.5.783>

- Syme, M. L., & Cohn, T. J. (2016). Examining aging sexual stigma attitudes among adults by gender, age, and generational status. *Aging & Mental Health, 20*, 36–45.  
<https://doi.org/10.1080/13607863.2015.1018984>
- Tenbergen, G., Wittfoth, M., Frieling, H., Ponseti, J., Walter, M., Walter, H., ... Kruger, T. H. (2015). The neurobiology and psychology of pedophilia: Recent advances and challenges. *Frontiers in Human Neuroscience, 9*, 344.  
<https://doi.org/10.3389/fnhum.2015.00344>
- Yang, L., Demetriou, L., Wall, M. B., Mills, E. G., Zargaran, D., Sykes, M., ... Dhillon, W. S. (2020). Kisspeptin enhances brain responses to olfactory and visual cues of attraction in men. *JCI Insight, 5*, e133633. <https://doi.org/10.1172/jci.insight.133633>
- Yarhouse, M. A. (2008). Narrative sexual identity therapy. *American Journal of Family Therapy, 36*, 196–210. <https://doi.org/10.1080/01926180701719117>

## Appendix A

### Ethics Approval for the Research Study Included in Chapter 3

06/09/2023

**Université d'Ottawa**

Bureau d'éthique et d'intégrité de la recherche

**University of Ottawa**

Office of Research Ethics and Integrity

#### CERTIFICAT D'APPROBATION ÉTHIQUE | CERTIFICATE OF ETHICS APPROVAL

<b>Numéro du dossier / Ethics File Number</b>	H-11-22-8614
<b>Titre du projet / Project Title</b>	Assessing Changes in Sexual Attractions
<b>Type de projet / Project Type</b>	Thèse de doctorat / Doctoral thesis
<b>Statut du projet / Project Status</b>	Approuvé / Approved
<b>Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)</b>	15/12/2022
<b>Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)</b>	14/12/2023

#### Équipe de recherche / Research Team

<b>Chercheur / Researcher</b>	<b>Affiliation</b>	<b>Role</b>
Lucas WALTERS	École de psychologie / School of Psychology	Chercheur Principal / Principal Investigator
Martin LALUMIERE	École de psychologie / School of Psychology	Superviseur / Supervisor
Julia FELGNER	École de psychologie / School of Psychology	Étudiant-chercheur / Student-researcher

**Conditions spéciales ou commentaires / Special conditions or comments**

550, rue Cumberland, pièce 154    550 Cumberland Street, Room 154  
Ottawa (Ontario) K1N 6N5 Canada    Ottawa, Ontario K1N 6N5 Canada

613-562-5387 • 613-562-5338 • [ethique@uOttawa.ca](mailto:ethique@uOttawa.ca) / [ethics@uOttawa.ca](mailto:ethics@uOttawa.ca)  
[www.recherche.uottawa.ca/deontologie](http://www.recherche.uottawa.ca/deontologie) | [www.recherche.uottawa.ca/ethics](http://www.recherche.uottawa.ca/ethics)

## Appendix B

### Ethics Approval for the Research Study Included in Chapter 4

**Université d'Ottawa**

Bureau d'éthique et d'intégrité de la recherche

**University of Ottawa**

Office of Research Ethics and Integrity

18/08/2024

#### CERTIFICAT D'APPROBATION ÉTHIQUE | CERTIFICATE OF ETHICS APPROVAL

<b>Numéro du dossier / Ethics File Number</b>	H-09-23-9621
<b>Titre du projet / Project Title</b>	Assessing Sexual Attractions Over Time
<b>Type de projet / Project Type</b>	Thèse de doctorat / Doctoral thesis
<b>Statut du projet / Project Status</b>	Renouvelé / Renewed
<b>Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)</b>	14/09/2023
<b>Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)</b>	13/09/2025

#### Équipe de recherche / Research Team

<b>Chercheur / Researcher</b>	<b>Affiliation</b>	<b>Rôle</b>
Lucas WALTERS	École de psychologie / School of Psychology	Chercheur Principal / Principal Investigator
Martin LALUMIERE	École de psychologie / School of Psychology	Superviseur / Supervisor

**Conditions spéciales ou commentaires / Special conditions or comments**

550, rue Cumberland, pièce 154    550 Cumberland Street, Room 154  
Ottawa (Ontario) K1N 6N5 Canada    Ottawa, Ontario K1N 6N5 Canada

613-562-5387 • 613-562-5338 • [ethique@uOttawa.ca](mailto:ethique@uOttawa.ca) / [ethics@uOttawa.ca](mailto:ethics@uOttawa.ca)  
[www.recherche.uottawa.ca/deontologie](http://www.recherche.uottawa.ca/deontologie) | [www.recherche.uottawa.ca/ethics](http://www.recherche.uottawa.ca/ethics)