Exploring the connection between tightness-looseness, sexual health, and well-being: A mixed-methods approach

A Thesis Submitted for the Degree of Doctor of Philosophy

By

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Declarations

I, Tristin Lynn Agtarap, declare that this thesis is my original work. I confirm that this work was conducted while enrolled for a PhD Psychology degree at Brunel University London and was conducted in accordance with the University Code of Research Ethics. All literature and other sources of information used or referred to in this thesis have been duly acknowledged. No part of this thesis has been submitted elsewhere for any other degree.

Acknowledgments

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This thesis is a testament to the collective effort and support of these remarkable individuals, and for that, I am sincerely thankful.

Note on Inclusion of Published Work

As this thesis is being submitted via 'Thesis by Publication', chapters 2, 3, and 5 of this thesis have been submitted for publication during the period of my PhD registration; the copyright of these papers resides with the publishers. The publication status are:

Chapter 2

Agtarap, T., Adair, L., & Schmitt, D. Beyond personality, attachment, & sociosexuality: How mindset correlates with attitudes and intentions toward infidelity. (Manuscript Submitted).

Chapter 3

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Chapter 5

Agtarap, T., Adair, L., & Schmitt, D. Mindset and Sexual Health: Does mindset impact receptiveness to sexuality education curricula? (Manuscript Submitted).

Abstract

This thesis is an exploration of the multifaceted realm of sexual attitudes, sexual health, and sex education, with a central focus on their relationship with mindset (tightness-looseness). Across four studies, we delve into the attitudes and intentions toward infidelity (chapter 2), perceived psychological benefits of comprehensive sex education (chapter 3), exploration of tightness-looseness and sexual health-related policies within a 'loose' nation (chapter 4), and examination of outcomes associated with tightness-looseness within a gamified sexual health training program (chapter 5). Our results suggest that discernible patterns emerge within a framework of tightness-looseness concerning sexual health outcomes, both when considered as a regional factor and as an individual difference factor. Specifically, on the regional level, 'looser' states tended to implement policies that ensured inclusive approaches to sex education and were more likely to have legislation protecting access to contraceptive care (i.e., abortion), compared to tighter states. On the individual level, people with a looser mindset tended to express more positive attitudes and greater intentions toward infidelity, compared to tighter mindsets. Likewise, looser mindsets tended to score lower on sexual-related guilt and higher on sexual-related comfort in comparison to tighter mindsets. Notably, individuals with a tighter mindset showcased greater confidence in sexual self-efficacy. Our findings indicate that the tightness-looseness framework plays a significant role in shaping patterns related to sexual attitudes and experiences, as well as outcomes related to sexual health. In addition to mindset, our participants emphasized that comprehensive sex education brings a range of positive mental health and well-being benefits. This includes contributing to the normalization and destigmatization of sexual experiences and gender-expansive identities, fostering increased feelings of psychological safety, awareness, and informed decision-making. Taken together, this thesis contributes to the growing body of literature exploring the complex intersections of mindset, sexual attitudes, and health outcomes. Specifically, we investigate sexual attitudes and intentions toward infidelity, the psychological benefits of sex education, regional trends in sexual health-related policies, and individual-level outcomes when engaging in a sexual health training program. Furthermore, and to our knowledge, this thesis is the first of its kind to evaluate the use of the tightness-looseness framework as an explanatory model for sexual behaviors, experiences, attitudes, and policies. Implications, contributions, and advancements to the field of sexual health are discussed, as well as directions for future researchers.

Chapter 1: General Introduction

1.1. Introduction

Sexual health is essential for overall well-being, playing a foundational role in both public health and an individual's mental and physical well-being. It extends beyond the mere absence of disease or dysfunction, encompassing various aspects of sexual and relational functioning, such as interpersonal relationship dynamics, fertility and reproductive health, and emotional wellness (World Health Organization, 2023). The significance of sexual health underscores the need for open communication and inclusive environments that respect individual choices and identities, making inclusive and accessible sexual education vital for fostering sexual health. Moreover, recognizing the profound impact of sexual health on both individuals and communities calls for a deeper examination of sexuality and sexual health-related outcomes. This thesis is designed to explore the psychological elements of sexual health beyond the physical experience (e.g., lowering STI rates and unintended pregnancies). Specifically, this thesis positions tightness-looseness as an explanatory factor - a variable that can explain regional and individual differences in sexual health-related outcomes with respect to attitudes and intentions toward infidelity, regional patterns of social policies related to sexual health, and outcomes of attitudes and experiences associated with sexual health training programs. In addition to mindset, this thesis highlights the mental health contributions associated with comprehensive sex education. Throughout this exploration, we will delve into the challenges and opportunities in promoting a more informed and inclusive approach to sexuality in today's world.

Taken together, this thesis stands as a pivotal exploration into the psychological dynamics of sexual health, addressing the 'why' of sexual health research through a comprehensive examination of the relationship between mindset, sexual attitudes and experiences, and overall psychological well-being. By evaluating the impact of mindset, particularly the tightness-looseness continuum, on attitudes toward infidelity, mental health outcomes of comprehensive sex education, and receptivity to sexual health programs, this research underscores critical factors shaping individual experiences and societal norms. A foundational rationale to this thesis is that mindset provides a valuable lens through which we can understand the diversity in sexual attitudes and behaviors across individuals (presented in chapters 2 and 5) and groups (presented in chapter 4). This exploration offers insights into how adherence to or deviation from social norms may shape intimate relationships, sexual

health experiences, and even the policies we abide by - contributing to a more holistic understanding of the factors influencing sexual health outcomes.

Therefore, the significance and impact of this work lies not merely in presenting correlations, but in using our models to represent and understand the complexities of human sexuality, as a set of experiences and attitudes shaped by social rules and our inclination to follow them. As the following chapters unfold, they collectively highlight the contribution of recognizing mindset as a multifaceted factor, bridging the macroscopic societal landscape (presented in chapter 4) with the micro-level intricacies of individual responses to attitudes and intentions toward infidelity (chapter 2) and sexual health interventions (chapter 5). Indeed, apart from mindset, a comprehensive qualitative analysis regarding the perceived mental health benefits of comprehensive sex education is presented (chapter 3), which in turn inspired the outcome variables for the sexual health intervention study (chapter 5). This thesis, therefore, serves as a call to action for scholars and practitioners, urging a re-evaluation of established paradigms to foster a more informed and person-centred approach to sexual well-being. Through its empirical foundation and interdisciplinary lens, the work contributes to advancing the field of sexual health, offering insights that have implications for scholarly work, policy, education, and individual well-being.

Section 1.2 of this chapter will read as a concise literature review breaking down variables used and relationships explored throughout the entirety of this thesis, including individual difference factors that predict infidelity (chapter 2), the relationship between comprehensive sex education and well-being (chapter 3), and the attitudinal changes that result from engagement with a sex education curriculum (chapter 5). Section 1.2.1 thoroughly explains the concept of tightness-looseness and the use of the variable to assess cultural variation between and within nations while also proposing its use as an individual difference factor. In section 1.2.2, I outline factors that predict sexual risk-taking (e.g., personality, romantic attachment, sociosexuality), with a focus on infidelity. Section 1.2.3 defines comprehensive sex education and provides an outline of the gap in the literature when evaluating the mental health implications of comprehensive sex education. Section 1.2.4 evaluates the intersection of individual differences, sex education, and game-based learning. Lastly, the concluding section of this chapter outlines this thesis (section 1.3).

1.2. Literature Review

1.2.1 Mindset: Tightness-Looseness

Mindset is conceptualized as a cognitive spectrum ranging from "tighter" to "looser". Tightness-looseness can be conceptualized as a continuum, with tighter mindsets at one extreme and looser at the other. Tighter mindsets are characterized as upholding strict expectations around social norms and endorse that those who violate established norms deserve (or have a right to) severe punishment or consequences (Gelfand et al., 2006). Meanwhile, looser mindsets are characterized as upholding leniency towards themselves and others when deviating from social norms; they exhibit less formality and do not endorse strict punishment when breaking rules or social regulations (Gelfand et al., 2006). Typically, the tightness-looseness framework is used to tap into the degree to which one enforces or relaxes social norms, the flexibility or tolerance of deviant behaviors, and the endorsement of conformity, predictability, and order (Uz, 2014). Mindset is shaped by cultural and societal factors and plays a pivotal role in defining how individuals (Gelfand et al., 2006), communities (Dunaetz, 2019), provinces (Chua et al., 2019), and even nations (Gelfand et al., 2011) perceive and respond to various aspects of life.

While this framework is most commonly applied to explain group-level differences (i.e., between nations or societies; Wormley et al., 2020), researchers have begun demonstrating its variability within these groups. For example, researchers Chua and Huang (2019) mapped tightness-looseness across 31 provinces in China (a 'tighter' nation; Yan et al., 2020) and found that tightness-looseness scores varied significantly from province to province. Indeed, on the societal level, tighter provinces demonstrated stricter social norms surrounding daily living and everyday behaviors (e.g., stronger religious practices, a stronger emphasis on the importance of God, and a greater number of temples and churches). Whereas individuals within looser provinces showed tolerance towards behaviors that are deemed culturally sensitive (e.g., public displays of affection and smoking). In a similar light, researchers have demonstrated state-by-state variability within the United States (a 'looser' nation; Harrington & Gelfand, 2014). For example, when evaluated on the societal level, states on the tighter end of the continuum reported a preference for stricter police engagement, less social media freedom, expressed concern regarding the distribution of condoms within schools, and ultimately upheld conservative political ideologies inclusive of restrictions on lesbian, gay, bisexual, trans, and queer (LGBTQ) rights (a finding that will be visualized and critically evaluated in chapter 4; Harrington & Gelfand, 2014). In addition to nation-level variance, researchers have evaluated tightness-looseness within religious communities (Jackson et al., 2021), social classes (Harrington, 2017), and between men and women (Qin et al., 2023). Expanding beyond a purely cultural lens, scholars have adapted the

tightness-looseness scale to assess sexuality norms (Jamshed et al., 2022) and gender norms (Wormley et al., 2021).

In the examination of mindset within this thesis, a pivotal consideration centers around the challenge of operationalizing and measuring mindset, spanning from societal to individual levels. Commonly, the conceptualization of mindset in existing literature adopts a group-level language, encapsulating collective attitudes and norms, exemplified by statements such as '*In this country, there are very clear expectations for how people should act in most situations*.' Expanding beyond this conventional approach, the thesis extends the operationalization of mindset to the individual level. Notably, the theories of cultural values, as discussed by researchers like Hofstede (1980) and Schwartz (1994), have grappled with the paradox wherein country-level value structures may significantly differ from those at the individual level. Indeed, with Schwartz developing his own value dimensions at two levels: country-level and individual level (Fischer et al., 2012). Similarly, this research departs from the typical societal focus with the aim to capture the perspective of individuals by modifying items to adopt a first-person point of view.

This innovative conceptualization, while not exempt from limitations (see chapter 6), offers a new understanding of how adherence to societal norms may shape attitudes, intentions, and experiences related to sexual variables. As the subsequent chapters unfold, they contribute further rationale and insights into the underlying mechanisms, elucidating relationships and trends between individual mindset and pivotal outcome variables in this thesis. The exploration spans attitudes and intentions toward infidelity, STI-related stigma and shame, sexual self-efficacy, comfort with sexuality, and sex-related guilt, providing a comprehensive understanding of how mindset operates when measured on the individual levels (chapter 2 and 5). Together, this data speaks to the existence of individual differences that are captured through a lens of an individualised mindset measure. Indeed, as called upon in Chapter 6, future researchers must further validate the use of this new operationalization and further evaluate to what extent an individual's mindset matches when captured on the societal level and group level (e.g., to what extent does an individual's mindset mirror the collective trains of their culture, and how does this individual expression align or diverge from broader societal trends? To what extent can an individual embody a 'tight' mindset while residing in a culturally 'loose' environment or vice versa?).

Arguably, each component and evaluation level is crucial as they contribute to a comprehensive understanding of the nuanced ways in which tightness-looseness manifests across diverse social and cultural domains. These variations not only enrich our

understanding of the concept but also highlight its relevance and applicability when exploring the intricate dynamics of the tightness-looseness framework viewed from a romantic relationship and sexual health perspective. Indeed, the literature suggests that tightness is associated with commitment to a set of shared values and rule-following (Uz, 2014), prioritizing loyalty, and adherence to relationship norms, such as heteronormativity (Jackson et al., 2019). In contrast, looseness is associated with a greater willingness to reject established norms, engage in risk-taking behavior, and seek instant gratification (Gelfand et al., 2006), traits previously linked to infidelity (Ebrahimi et al., 2021). Based on these findings, it is anticipated that an individual with a looser mindset may be inclined to harbor attitudes or intentions that deviate from the anticipated norms of loyalty or fidelity within a romantic relationship. Indeed, Chapter 2 will focus on positioning mindset as an individual-difference factor to further explore its predictive value related to attitudes and intentions toward infidelity.

Additionally, there is an established relationship within the literature connecting tightness and various prejudiced attitudes towards ethnic and sexual minorities, as well as those who cohabitate before marriage (examined across 25 nations; Jackson et al., 2019). Moreover, scholars outline that people who perceive a greater threat to their nation or communities (typically evaluated through a lens of anti-gay and/or anti-immigration) consistently endorse and support political candidates working to rebuild 'order' and 'conformity' (Jackson et al., 2019). Thus, one might predict that individuals living in tighter states will showcase voting behaviors in support of candidates that uphold similar conservative values - which in turn lead to abstinence-only focused sex education and greater restrictions for abortion access. Indeed, Chapter 4 will map the variance of tightness-looseness within the US and statistically examine the regional patterns between mindset and sexual health-related policies: Sex Education and Abortion Legality.

Lastly, expanding on the literature associating tightness with prejudiced attitudes (Jackson et al., 2019), and acknowledging that sexual health encompasses numerous stigmatized topics often viewed as taboo (e.g., gender diversity, sexual pleasure, anal sex), one could hypothesize that mindset might influence one's engagement with a sex education program. Given that these topics may be considered inappropriate or uncomfortable, Chapter 5 will examine whether tightness-looseness, as an individual-level variable, moderates people's responses to a sexual health training program, including potential changes in attitudes towards STI-related stigma and shame, comfort with sexuality, sex guilt, and sexual self-efficacy.

1.2.2 Infidelity

One objective of this thesis is to examine if the variable of mindset adds predictive value to a model when examining infidelity attitudes and intentions. According to Mahambrey (2020), infidelity encompasses unapproved emotional or sexual actions that occur outside a committed relationship. Research related to infidelity, as discussed here, align with this definition. It's important to note that ethical non-monogamy is an exception and falls outside the scope of this definition. Infidelity has been repeatedly reported as the most threatening and costly behavior one may engage in with respect to their partnerships (Beltran-Morillas et al., 2019) and cited as the most common reason for divorce (Wilson et al., 2011), not to mention its detrimental psychological impact on the betrayed partner (Roos et al., 2018). Indeed, identifying factors that can anticipate infidelity provides significant advantages. However, there is a gap in the literature, as limited research has delved into norm adherence and rule-following and its potential impact when predicting infidelity attitudes and intentions. To appropriately evaluate the predictive value of mindset, Chapter 2 tests multiple conceptualizations of infidelity by examining mindset within a model consisting of other predictor variables that have already been found to predict the likelihood of engaging in infidelity behaviors: *Personality, Adult Attachment,* and *Sociosexuality*. The following subsections will further define and outline previous literature in relation to each predictor variable examined against infidelity.

1.2.2.1 Personality & Infidelity

Personality has been a focal point in psychologists' exploration of infidelity (Gibson et al., 2016). Typically, researchers employ the Big Five model of personality to explore the connection between personality traits and infidelity (Buss & Shackelford, 1997; Gibson et al., 2016; Schmitt, 2004). The Big Five encompasses fundamental traits - openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism - that serve as a framework for assessing individuals' personalities worldwide (Costa & McCrae, 1992). Openness tends to be conceptualized as a tendency to entertain unconventional ideas, embrace change, and seek variety and diversity in one's experiences (e.g., exploring new ways of doing things; Silvia & Christensen, 2020). Given their willingness to explore new and unconventional ideas and experiences, some find that those high in openness are more likely to engage in infidelity (especially for men; Schmitt, 2004). Conscientiousness is commonly defined as a propensity to engage in careful planning, goal-directed behavior, and demonstrate good impulse control

(Roberts et al., 2009). Given their tendency to follow social norms and be highly aware of how their behavior affects others (Gibson et al., 2016), those high in conscientiousness tend to report more relationship exclusivity and less sexual infidelity (Allen & Walter, 2018; Schmitt, 2004).

Extraversion (or extroversion) is characterized by emotional expressiveness, sociability, and higher levels of self-esteem (Gibson et al., 2016). Previous studies have found that those who are higher on extraversion are more likely to attract and seek potential partners, making it easier to partake in casual sexual activities, including acts of infidelity (Gibson, Thompson, O'Sullivan, 2016; Miller et al., 2004). Agreeableness is often conceptualized as an inclination towards empathy and concern for others, as well as a tendency to engage in prosocial behaviors (Gibson et al., 2016; Miller et al., 2004). Previous research suggests that individuals low on agreeableness are more likely to engage in infidelity and sexual aggression (Allen & Walter, 2018); given those who engage in extradyadic affairs tend to be disagreeable, non-empathic, and manipulative (Buss & Shackelford, 1997; Costa & McCrae, 1992; Miller et al., 2004; Schmitt, 2004). Neuroticism is characterized by emotional instability, anxiety, as well as a general lack of positive psychological adjustment (Gibson et al., 2016; Miller et al., 2004). Those high on neuroticism report lower levels of relationship satisfaction and greater levels of insecurity (Karney & Bradbury, 1997; McCrae & John, 1992); as such, this trait has been linked to sexual dissatisfaction and dysfunction (Allen & Walter, 2018) and sexual infidelity (Whisman et al., 2007).

A strong theoretical foundation exists within the literature connecting personality and tightness-looseness. Such as that looseness is consistently associated with greater levels of openness and extraversion, and lower levels of conscientiousness (Chua et al., 2019; Harrington & Gelfand, 2014). Moreover, Chua et al. (2019) suggest that individuals living in tighter communities exhibit higher self-monitoring, implying that tightness cultivates a heightened awareness regarding their interactions with society. This foundational research establishes the groundwork for exploring the potential correlation between a looser mindset and infidelity. Notably, many traits associated with looseness correspond with those highlighted in the aforementioned infidelity literature, potentially heightening the likelihood that an individual may hold more favorable attitudes and stronger intentions toward infidelity. While valuable research has already been conducted in this area, this thesis (chapter 2) seeks to extend this theoretical framework by examining how mindset contributes additional predictive value to a model that includes these key personality factors (i.e., openness to

experience, conscientiousness, extraversion, agreeableness, and neuroticism) when predicting attitudes and intentions toward infidelity.

1.2.2.2 Adult Attachment & Infidelity

The foundation of attachment theory begins with Bowlby's (1969, 1973, 1980) research which emphasized the importance of early parent-child relationships and their impact on emotional and social development. Such work prompted further evaluation of attachment theory by Ainsworth et al. (1978), which examined caregiver and infant relationships, ultimately forming the concept of attachment styles (secure, avoidant, and anxious), which are commonly evaluated and validated in the literature today. Indeed, researchers have explored attachment theory across a plethora of demographic variables including, but not limited to, gender (Sechi & Vismara, 2023), sexual orientation (Wright-Haertel, 2023), and relationship status (Sagone et al., 2023). Such evaluations are commonly examined within romantic partnerships (Mohd Hasim et al., 2023) and outcomes of partnerships (e.g., cheating or divorce; Savira, 2023) This thesis views and defines adult attachment styles as the habitual patterns regarding how individuals connect with and depend on their romantic partners (Hazan & Shaver, 1987). In a general sense, these styles mirror the extent to which someone feels at ease disclosing to and relying on their romantic partner.

Securely attached individuals report longer-lasting relationships, emotional security, and greater levels of acceptance for supporting their partner despite their faults (Simpson, 1990). Additionally, individuals with a secure attachment tend to possess a positive self-image, viewing themselves as likable and worthy of receiving romantic love (Sagone et al., 2023). Those who report avoidant attachment styles are characterized by fear of intimacy, difficulty with being emotionally vulnerable with their partner, and are more likely to question their feelings for their romantic partner (Simpson, 1990). Lastly, those who were more anxiously attached reported that their partners were unwilling to be as emotionally connected as they would like, felt their partner did not really love them, and tended to experience higher levels of romantic obsession paired with intense worry about abandonment (Sagone et al., 2023). Overall, the study of differences in attachment style assists with our understanding of why and how romantic relationships differ in their quality and longevity. Moreover, including attachment might pose significant value when paired with mindset and predicting infidelity attitudes and intentions.

Given the relationship between attachment and romantic relationship quality, satisfaction, and longevity (Barbaro et al., 2016), it is unsurprising that attachment style has

been linked to infidelity. For example, individuals with an avoidant attachment style often exhibit more permissive attitudes toward casual sexual relationships and are more accepting and aware of alternative intimate partners (Barbaro et al., 2016; DeWall et al., 2011). Supporting this correlation, survey studies have found that men with avoidant attachment styles reported the highest levels of extradyadic involvement over a two-year period compared to those with a securely attached style (Allen & Baucom, 2004). In summary, the literature suggests that individuals with an avoidant attachment style may be more prone to the temptation of infidelity, consequently harboring more positive attitudes and stronger intentions to engage in such behavior. Indeed, the characteristics of an anxious attachment style (e.g., worry about abandonment and desire for close proximity; Sagone et al., 2023) may seem paradoxical when considering engaging in behaviors that put one's relationship at risk. Researchers Sakman et al. (2021) successfully demonstrated how the fear of being single serves as a pathway connecting attachment anxiety to infidelity. Likewise, research reports that women who are anxiously attached report a higher number of affairs within a 12-month period compared to those who were avoidantly or securely attached (Bogaert and Sadava, 2002; Allen & Baucom, 2004). Broader research findings associate attachment anxiety with engagement in risky sexual behaviors (e.g., condomless sex and multiple sex partners; Kim & Miller, 2020) Taken together, the literature demonstrates that those with either anxious or avoidant attachment styles report engaging in infidelity more often than securely attached individuals.

Regarding mindset, our proposition is that individuals with a tighter mindset may demonstrate a more structured and rule-bound approach to romantic attachment, aligning more closely with a secure attachment style. On the contrary, looseness could be associated with attachment styles that are more fluid, allowing for less adherence to societal structures and a greater propensity for deviance for risk-taking behaviors. As such, Chapter 2 expands upon the literature by investigating if adult attachment is interrelated to mindset and how it can be further explored in a model predicting attitudes and intentions toward infidelity.

1.2.2.3 Sociosexuality & Infidelity

Sociosexuality is a concept delving into an individual's inclination toward engaging in sexual activities outside of committed relationships, representing an individual's sexual strategy (short or long-term; Millar et al., 2019; Simpson & Gangestad, 1991). Sociosexuality is comprised of three key elements: sexual behaviors, attitudes, and desires (Simpson & Gangestad, 1991). These components collectively form the spectrum of sociosexual

orientation, ranging from unrestricted to restricted orientations. Those leaning toward an unrestricted orientation exhibit higher comfort levels with casual sexual encounters, a history of multiple sex partners, and increased extradyadic involvement (Urganci et al., 2021) and are typically defined as employing a short-term sexual strategy (Millar et al., 2019). Conversely, individuals with a restricted orientation typically prioritize commitment and emotional closeness before engaging in sexual activities (Weiser et al., 2018) and, as such, are defined as exhibiting a long-term sexual strategy (Millar et al., 2019).

Broader literature outlines associations of an unrestricted orientation with a greater likelihood of relationship dissolution through a decline in relationship quality (Urganci et al., 2021) and satisfaction (though this was weakened by frequent sex and high sexual satisfaction; French et al., 2019). Moreover, current literature notes that those with an unrestricted sociosexual orientation are more likely to exhibit behaviors such as messaging, spending time, and engaging in sexual activities with individuals met via online dating platforms whilst in exclusive relationships, as well as joining platforms with the motivation to engage in emotional or sexual infidelity, compared to people with restricted sociosexual orientations (Hackathorn & Ashdown, 2021). Further research indicates a correlation between a more unrestricted sociosexual orientation and lower levels of relationship commitment, thereby increasing the likelihood of infidelity (Mattingly et al., 2011). Indeed, unrestricted sociosexuality was affiliated with more positive attitudes toward infidelity as well as more frequent reports of prior sexual infidelity (Rodrigues et al., 2017).

Taken together, there is a strong foundation supporting the relationship between sociosexuality and infidelity. Our model is interested in exploring how infidelity may be examined via one's sexual strategy (sociosexuality) and adherence to norms or rule-breaking (mindset). Thus, this thesis (chapter 2) will evaluate if individuals with a looser mindset complement or enhance a model including sociosexuality as a predictor of infidelity.

1.2.3 Comprehensive Sex Education

In the realm of sexual health, the importance of comprehensive sex education stands as an undeniable cornerstone. At its core, comprehensive sex education goes beyond the dissemination of human biology and abstinence instruction, extending into the teachings of relationships (Braeken & Cardinal, 2008), gender and power (Sell et al., 2021), consent (Burton et al., 2023), diversity and inclusion (Meadows, 2018), and pleasure-based sex (Mark et al., 2021). Typically, comprehensive sex education includes lessons on sexual communication, sexual self-efficacy (i.e., confidence/communication building), sexual

norms, and demonstrations of condom use (World Health Organization, 2023) - indeed, curricula that will be employed and evaluated within Chapter 5. Compared to other sex education curricula - abstinence-only - which presses an abstinence-until-marriage approach to sex education rather than teachings of broader contraceptive options (e.g., condoms, the pill, IUD; Zeiler, 2014).

When addressing the multifaceted aspects of human sexuality, comprehensive sex education equips individuals with the tools to make informed decisions, establish healthy relationships (both platonically and romantically; Sell et al., 2021), and navigate the diverse landscapes of sexual experiences inclusive of neuro-diversity, non-heterosexual, and gender-expansive identities (Barnett & Maticka-Tyndale, 2015; Besoain-Saldaña et al., 2023; Esmail et al., 2010). When examining the facets of comprehensive sex education, it becomes clear that this approach extends beyond mitigating risks (e.g., reducing rates of STIs and unintended pregnancies; Mark et al., 2021). Instead, it emphasizes the cultivation of a basis for positive sexual well-being and agency over bodily autonomy. Such outcomes associated with comprehensive sex education typically encompass feelings of empowerment (Najmabadi & Sharifi, 2019), enhanced body image and self-esteem (Goldfarb & Lieberman, 2021), and LGBTQ+ individuals reporting fewer accounts of bullying, normalizing broader sexual experiences and identities (Baams et al., 2017). However, navigating the implementation of comprehensive sex education is not a straightforward journey. The path is woven with the complexities of politics, religion, and culture (Kramer, 2019; Hall et al., 2016), presenting numerous challenges in gaining momentum for the implementation of these policies. Ultimately, political ideologies, religious doctrines, and cultural norms often shape how pupils receive sex education (if at all).

These complexities tend to result in the promotion of abstinence-only education, which advocates for individuals to defer sexual intimacy until marriage (Jeffries et al., 2010). Within this abstinence-only framework, knowledge and information on contraceptive use and the prevention of sexually transmitted infections (STIs) are often limited or used as fear tactics in an attempt to mitigate an individual's desire to be intimate (Wilson et al., 2012). As a result, US states that press an abstinence-only framework tend to have higher rates of teenage pregnancies and teen births (Stanger-Hall & Hall, 2011) compared to states that implement a comprehensive framework. Researchers also report that individuals who take part in an abstinence-only sex education course do not feel that the curriculum is of high value, nor does it align with the modern-day realities of dating (e.g., safe online dating, pornography, gender-expansive identities; Gardner, 2015). Often, those who are subject to

abstinence-only education report that they are left with more questions and a desire to have an education that is comprehensive in its curricula (Hole et al., 2022) - indeed, all of these findings associated with abstinence-only education are replicated and expanded upon in Chapter 3.

In examining the outcomes linked to comprehensive sex education, a limitation highlighted in this thesis (chapter 3) is its predominant emphasis on physical health and behavior change results (Goldfarb & Lieberman, 2021). This focus prioritizes the reduction of teenage pregnancies and STI transmission rates (Jeffries et al., 2010), alongside promoting abstinence and increased condom use (Wilson et al., 2012). Unfortunately, this approach tends to overlook the critical evaluation of mental health and well-being outcomes (Goldfarb & Lieberman, 2021). Notably, a small but growing body of literature is paving the path forward by highlighting the relationship between comprehensive sex education and psychological outcomes. Specifically, this research finds that the implementation of comprehensive sex education curricula in secondary schools is associated with fewer accounts of bullying of sexual minority students (Baams et al., 2017) and fewer reports of suicidal ideation and depressive episodes in students who identify as LGBTQ+ (Proulx et al., 2019). On the other hand, researchers are shedding light on some of the detriments of traditional abstinence-focused sex education, explaining that abstinence-only frameworks may be doing more harm than good, as various accounts of increased negative emotions (e.g., shame, embarrassment, stigma, loneliness, and dysphoria) for people with gender-expansive identities are routinely identified after undergoing abstinence-focused education programs (Jeffries et al., 2010; Tordoff et al., 2021).

Taken together, we know that the implementation of comprehensive sex education is not a straightforward path, and the settlement of implementing an abstinence approach holds a host of negative consequences. Further research is required to draw parallels between communities implementing sex education frameworks that more closely adhere to abstinence versus comprehensive curriculum, as well as individual factors that may hinder or aid a person's experience when engaging in sex education curricula. Our work will add to this body of literature by employing a qualitative approach that further explores the perceived mental health and well-being benefits of comprehensive sex education (chapter 3), examining regional trends across the US and state mindset scores to see how societal factors (culture, political beliefs, and religion) interfere with sex education mandates and broader reproductive health access (i.e., abortion legality; chapter 4), and how mindset as an individual difference

variable might account for different outcomes associated with comprehensive sex education (chapter 5).

1.2.4 Individual Differences and Sexual Health-Related Outcomes

Another objective within this thesis is to explore variations in mindset and how tightness-looseness might interact with sexual health-related outcomes (e.g., sexual self-efficacy, sexual comfort, and guilt). Specifically, does individual variance account for attitudinal shifts before and/or after exposure to a sexuality and relationship training program? As outlined above (section 1.2.3), comprehensive sex education at its core embraces the expansion of abstinence-focused sexual health narratives by fostering a safe, educational environment for gender and sexual minority youth (Meadows, 2018; Richard et al., 2015) and conversations about sexual consent (Burton et al., 2023). Comprehensive sex education often involves teaching young people about boundaries and healthy partnerships (De La Rue et al., 2014) and provides young adults with tools to prioritize their sexual pleasure (Mark et al., 2021). Nevertheless, the quality of sexuality and relationship education curricula varies, and young adults often highlight inconsistent outcomes associated with exposure to sex education programs (e.g., varying levels of STI knowledge, sexual awareness, and contraceptive use; Almahbobi, 2012). We propose that individual differences significantly shape the extent to which someone will benefit (e.g., improved sexual self-efficacy) after engagement with a sex education program.

Individual differences (e.g., personality traits) encompass the unique characteristics found among individuals, contributing to the distinctiveness and individuality of each person (Baumeister, 2007). Indeed, researchers explore the ways in which individual difference factors (e.g., learning styles) can influence how people interact with learning materials, engage with certain educational subjects, and the academic outcomes they are likely to experience (Buckley & Doyle, 2017). Personality traits are a common individual difference variable evaluated in educational research. For example, researchers explain that agreeableness and conscientiousness consistently predict academic engagement (Qureshi et al., 2016) and performance (Poropat, 2009). Another common trait explored within educational research is learning styles, which have been cited to predict performance-related outcomes (e.g., academic engagement; Komarraju et al., 2011). Even more so, such traits have been explored against web-based learning platforms (Kauffman, 2015); such research suggests that when a learning program aligns with an individual's learning preference (e.g.,

visual vs. verbal; sequential vs. global), their motivation and receptivity to the information presented increases (Hwang et al., 2012).

Taken together, it is clear that individual differences hold a direct relationship with individual learning outcomes and to what extent someone will report an attitudinal change following exposure to a curriculum (e.g., increased motivation). Indeed, this literature underscores the importance of evaluating individual differences in educational research. Notably, the research emphasizes the impact of individual variations on both receptivity to and outcomes of online education programs. What is missing is the intersection of individual differences, educational receptivity, and sexual health training programs. Indeed, Chapter 5 proposes mindset as an individual difference factor that may shape the extent to which people benefit from (i.e., communication, sex norms, confidence) engagement in a sex education program.

1.3. Thesis Overview

Within this thesis, I explore and evaluate the relationship between mindset, sexual attitudes, and sexual health. I present four empirical chapters, three of which investigate the variable of mindset (tightness-looseness) and how it factors into attitudes and intentions toward infidelity and sexual health-related outcomes, while the other explores the significance of mental health and well-being outcomes of comprehensive sex education. Chapter 2 demonstrates that individuals with a looser mindset (i.e., less adherence toward social norms and norm violation) tended to hold more positive attitudes and intentions toward infidelity in comparison to tighter mindsets. However, when testing if mindset added significant predictive value to a model inclusive of personality, adult attachment, or sociosexuality, the relationships became less clear. Specifically, looser mindsets did consistently predict attitudes toward infidelity when controlling for personality and sociosexuality; however, the results were less clear for intentions toward infidelity and attachment styles. This empirical chapter is a multi-study design; the first study recruited from three world regions: North America, Western Europe, and South/Southeast Asia; the replication study recruited individuals residing within the United Kingdom.

Chapter 3 explores the perceived and anticipated mental health implications of comprehensive sex education through a thematic analysis. This chapter demonstrates that across adulthood (18-74 years old) and within our sample, participants overwhelmingly reported that access to comprehensive sex education had a positive impact on mental health and well-being. Two superordinate themes arose, one being *psychological functioning and*

well-being, which captures the participants' perspective that sex education serves to normalize and destigmatize a range of sexual experiences, which also contributes towards alleviating fears, anxieties, and concerns surrounding one's sexuality and identity. The other is *knowledge,* which reflects patterns of participants' responses when reflecting on the benefits of sexual health knowledge, including that it facilitates safety, confidence, improved decision-making skills, and increases sexual health-related awareness.

Chapter 4 uses secondary data from Harrington & Gelfand (2014) to visualize and analyze variation in mindset within a 'looser' nation, the US. Furthermore, open data from the Guttmacher Institute and the Sexuality Information and Education Council of the United States (SIECUS) is used to create variables related to sex education and abortion legality to overlay patterns of mindset and sexual health. The importance of mapping the relationship between mindset and sexual health is two-fold. First, it demonstrates that mindset varies from tighter to looser on a state-by-state basis within a 'loose' nation. Secondly, it provides a clear visualization of the patterns and trends amongst mindset and sexual health-related variables (e.g., sex education policies and access to reproductive healthcare) - that is, we can begin to identify patterns in state-level tightness-looseness and sexual health-related policies and legislation. The assessment of social policies concerning sexual healthcare and the observed variations in alignment with state mindset scores reinforce the rationale for investigating mindset as an individual difference factor. These observed patterns at the societal level may extend to the individual level, potentially contributing to the reported inconsistencies in responses to sexual health programs, as discussed in Chapter 5.

Chapter 5 directly examines how tightness-looseness impacts receptivity toward sexual health and relationship educational material. Through a pretest-posttest experimental design, participants' mindset and attitudes and beliefs about sexuality (e.g., STI-related stigma and shame, sex guilt, comfort with sexuality, sexual self-efficacy) were assessed. Specifically, we explore how these sex-relevant attitudes and beliefs might be affected by engagement with an online sexual education program - and if mindset moderates the relationship between sex education engagement and sex-relevant attitudes. Chapter 5 draws on key psychological factors mentioned throughout previous empirical chapters; particularly, chapter three highlights psychological and emotional outcomes related to STI-related stigma and shame, confidence, open discussions, and reducing negative emotions associated with sex. As such, psychological and emotional variables (e.g., comfort with sexuality and sex guilt) were key outcomes investigated in the context of our online sex education program. Furthermore, we explore the potential moderating effect of mindset as an individual

difference factor, such that individuals with tighter or looser mindsets might experience different attitudinal shifts following their engagement with the online sex education program.

Lastly, chapter 6 summarizes the main findings of the thesis; it considers the limitations as well as the theoretical and practical implications of the work, how it advances the field of sexual health, and sets out suggestions for future directions and research.

To conclude, this thesis navigates the landscape of sexual health by meticulously examining the nexus between mindset, sexual attitudes, and overall well-being. Through a multi-study design, thematic analysis, and pretest-posttest experimental design, the empirical chapters explore the influence of mindset on attitudes toward infidelity, the mental health outcomes of comprehensive sex education, and the receptivity to sexual health programs. Notably, chapter 4 was designed and written to visualise and link the variables of mindset and sex education for the audience, prior to delving into chapter 5 – which empirically evaluates these variables. Indeed, mapping mindset variation within the United States and aligning it with sexual health-related policies works to showcase how these relationships (e.g., mindset and sexual health variables) co-exist. As mentioned previously, the concluding chapter (chapter 6) synthesizes these findings, emphasizing the interconnectedness of mindset, sexual attitudes, and well-being – as well as highlighting limitations and future directions of this work. Throughout the following chapters, I hope the work presented contributes to your understanding of human sexuality but also prompts you to critically reflect on how this work relates to implications for policy, web-based-education, and sexual well-being, urging a re-evaluation of established paradigms to foster a more informed and inclusive approach to sexual health.

Chapter 2: Beyond personality, attachment, and sociosexuality: How mindset correlates with attitudes and intentions toward infidelity

2.1 Introduction

When considering the various types of betrayal one may endure throughout a romantic relationship, infidelity is repeatedly reported as the most threatening (Beltran-Morillas et al., 2019). However, despite most individuals viewing infidelity as a threat, it continues to be common in romantic relationships (~25% of all committed relationships; Amato & Previti, 2004; Blow & Hartnett, 2005; Wilson et al., 2011). In fact, it is one of the most frequently mentioned reasons for seeking out therapy and is ultimately considered one of the most common reasons for divorce (Wilson et al., 2011; Amato & Previti, 2004; Mark et al., 2011). Furthermore, infidelity's long-term psychological impact and health risks are incredibly costly to the betrayed partner. For example, clinicians often refer to infidelity's overwhelming and long-lasting effects as interpersonal trauma, given the symptoms resemble post-traumatic stress disorder (PTSD; Roos et al., 2018). Specifically, Roos and colleagues (2019) reported that nearly half of their sample population (45.2%) experienced infidelity-related PTSD after being cheated on within a committed romantic relationship. Additionally, a large body of research explores how infidelity impacts public health concerns due to low rates of condom use with partners outside of the primary relationship, which results in placing the primary partner in direct exposure to various sexually transmitted infections.

For these reasons, many researchers in relationship science have attempted to investigate underlying predictor variables regarding sexual risk-taking behaviors (i.e., infidelity). These variables include but are not limited to, socio-demographics (e.g., gender, age, education, religion, relationship status), intraindividual variables (e.g., sociosexual attitudes and attachment styles), and interindividual variables (e.g., relationship satisfaction and incompatibility of partners; Mark & Haus, 2019; Labrecque & Whisman, 2017; Petersen & Hyde, 2010; Mark et al., 2011; Treas & Giesen, 2000; Fincham & May, 2017). As outlined, identifying factors that can predict infidelity offers valuable advantages. However, a gap in the literature exists where limited research examines norm adherence and rule-following and its potential role when predicting attitudes and intentions toward infidelity. To address this gap, we employed an online survey to explore two research questions: i.) are individuals with looser mindsets more likely to have positive attitudes and greater intentions towards infidelity than those with tighter mindsets, and ii.) when predicting attitudes and

intentions toward infidelity, does the variable of mindset add significant value to a model that includes personality, attachment, or sociosexuality? The following will provide an extensive breakdown of the variables included in this manuscript:

2.1.1 Mindset: Tightness-Looseness

Most commonly, the concept of tightness-looseness has been defined on a societal or cultural level rather than the individual level. The societal definition outlines two main components: 1) the clarity or perceived strength of social norms and 2) the extent to which one can deviate from the norms or the strength of sanctioning (Gelfand et al., 2006). Though literature is scarce with respect to mindset and infidelity, the foundation of the tightness-looseness framework rests on the concept of rule-breaking and norm violation (Gelfand, 2019). Within the tightness-looseness framework, "tighter" mindsets are correlated with a strong commitment to shared values (Uz, 2014), typically placing an emphasis on loyalty and adherence to relationship norms (Jackson et al., 2019). In contrast, a "looser" mindset tends to be associated with a greater willingness to question the status quo, reject established norms, and engage in risk-taking behaviors (Gelfand et al., 2006). Indeed, looseness has been negatively correlated with prosocial behaviors (Babič et al., 2018) and emotion regulation (Smith, 2017), traits which have also been related to previous infidelity engagement (Lindenberg et al., 2006; Ebrahimi et al., 2021). On the contrary, highly characteristic traits of tightness are outlined with conformity, risk avoidance, and a general preference for stability (Gelfand et al., 2006). Based on the characteristics outlined above, it is expected that an individual with a looser mindset may be more prone to holding attitudes or intentions that violate the expectations of loyalty or fidelity within a romantic partnership. Thus, this manuscript links mindset to infidelity through its association with rule-breaking and norm violation.

By understanding how individuals' mindset orientations align with the tightness-looseness continuum, researchers and practitioners can gain insights into the likelihood of rule-breaking and norm violation related to infidelity in romantic relationships. This connection provides a valuable perspective for exploring the complex interplay between psychological frameworks and attitudes and intentions toward infidelity. Such exploration contributes to addressing a gap within the literature, specifically around norm violation, rule-breaking, and infidelity.

2.1.2 Personality & Infidelity

Psychologists have used personality as a key variable when examining infidelity (Gibson et al., 2016). Typically, The Big Five model of personality is used to investigate the relationship between personality and infidelity (Buss & Shackelford, 1997; Gibson et al., 2016; Schmitt, 2004). The Big Five is a set of core traits that are used to assess the personalities of individuals across the globe: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (Costa & McCrae, 1992). Previous researchers report that all five personality factors have been linked to infidelity. Where those who cheat on their partner tend to report higher levels of openness (Schmitt, 2004), extraversion (Gibson et al., 2016; Miller et al., 2004), neuroticism (Whisman et al., 2007), and lower levels of conscientiousness (Schmitt, 2004) and agreeableness (Allen & Walter, 2018) compared to non-cheaters. Indeed, lower levels of conscientiousness (Isma & Turnip, 2019; Toplu-Demirtaş & Tezer, 2013) and agreeableness (Toplu-Demirtaş & Tezer, 2013) and greater levels of neuroticism (Isma & Turnip, 2019) are also cited as predictors of attitudes and intentions toward infidelity. However, a recent meta-analysis of 137 studies found no relationship between openness and infidelity and a weak relationship between extraversion and infidelity, notably lower levels of agreeableness and conscientiousness were consistently significant predictors of sexual infidelity (Allen & Walter, 2018).

Researchers have extensively examined the connection between personality traits and mindset, particularly within the framework of tightness-looseness. Harrington and Gelfand's (2014) research illustrates that individuals in looser societies tend to exhibit lower levels of conscientiousness and agreeableness, coupled with higher levels of openness. This foundational work sets the stage for understanding the potential relationship between a loose mindset and infidelity, as we see many traits associated with looseness have also been identified within the infidelity literature (Isma & Turnip, 2019; Toplu-Demirtaş & Tezer, 2013). Notably, these dimensions reflect traits such as impulsivity and desire for instant gratification (Uz, 2014), increasing a person's likelihood to hold more favorable attitudes and greater intentions toward infidelity (John et al., 2008). While existing research has contributed valuable insights, this paper aims to further explore whether incorporating mindset into a model alongside personality traits enhances the predictive value when investigating attitudes and intentions toward infidelity.

2.1.3 Adult Attachment & Infidelity

Adult attachment styles - or attachment orientations - capture patterns in individuals' ways of relating to and relying on romantic partners. Broadly speaking, attachment styles reflect the degree to which someone is comfortable opening up to and depending on a romantic partner. Some attachment theorists identify three distinct attachment styles: Secure, Avoidant, and Anxious-ambivalent (Hazan & Shaver, 1987). Indeed, researchers report that a non-secure attachment style is consistently a significant predictor of attitudes and intentions toward infidelity (Swets & Cox, 2023; Ferdosi, 2019). Taken together, those who cheat on their partners tend to report either avoidant (Allen & Baucom, 2004; DeWall et al., 2011) or anxious (Bogaert & Sadava, 2002) attachment styles, compared to non-cheaters.

In connection to mindset, we propose that individuals with a tighter mindset may exhibit a more structured and rule-bound approach to romantic attachment. This could manifest as a preference for clear relationship expectations, commitment, and adherence to societal norms governing their romantic partnerships. These individuals may seek security and stability within the established boundaries of a relationship, aligning with attachment styles characterized by security and dependability (i.e., secure attachment style). On the contrary, we propose that those with a looser mindset may approach romantic attachment with a greater degree of openness and sense of independence. Thus, looseness may be linked to attachment styles that are more fluid, allowing for less societal structure and more deviance or risk-taking behaviors (i.e., non-securely attached). This manuscript builds upon previous findings by investigating how adult attachment style is interrelated to infidelity and if mindset adds predictive value to a model that includes attachment when examining attitudes and intentions toward infidelity.

2.1.4 Sociosexuality & Infidelity

Sociosexuality or sociosexual orientation examines to what extent an individual is willing to engage in sexual activities outside of a serious romantic relationship (Simpson & Gangestad, 1991). Sociosexuality can be described as a continuum, with unrestricted sociosexual orientation at one end and restricted sociosexual orientation at the other. Individuals with more of an unrestricted orientation tend to report higher levels of comfort with sexual encounters, greater numbers of sexual partners over a lifetime, and increased reports of extradyadic involvement (Urganci et al., 2021). In contrast, those with a restricted orientation report a greater preference for commitment and emotional closeness prior to

engaging in sexual activities with a potential partner (Weiser et al., 2018). Researchers find that those with more unrestricted sociosexuality report less relationship commitment (Mattingly et al., 2011), increasing the likelihood that they will cheat on their romantic partners as well as displaying more favorable attitudes and greater intentions toward infidelity (Barta & Kiene, 2005).

With concern to mindset, as explained by previous researchers, tighter individuals are more inclined to adhere to restrictive or confided expectations regarding sexual behaviors (Jackson et al., 2019). This could result in a lower sociosexuality, indicating a reduced willingness to engage in casual or non-committed sexual relationships, decreasing the likelihood that they will display favorable attitudes and intentions toward infidelity. Thus, we propose that people with a looser mindset will exhibit more lenient attitudes toward sexual expression, leading to a higher sociosexuality as individuals feel greater freedom and independence to explore other potential mates. Indeed, this model would also explore to what extent people cheat due to their mating strategy (i.e., sociosexuality) or to what extent they cheat with respect to freedom and comfortability with norm violation (i.e., mindset). This manuscript will examine if mindset adds predictive value to a model encompassing sociosexuality when predicting attitudes and intentions toward infidelity.

2.1.5 Current studies

This article describes two survey study investigations of the relationship between personality, sociosexuality, attachment style, mindset, and infidelity. In both studies, we test two hypotheses: [H1] individuals with looser mindsets will report more positive infidelity attitudes and intentions, and [H2] mindset will add unique predictive value in a model including Big Five personality factors, sociosexuality, and attachment style. Hypothesis 2 will be supported if the nested model comparisons indicate that the more complex model, incorporating mindset, adds significant explanatory value. Study 1 serves as an initial test of these predictions, while study 2 attempts to replicate these relationships in an independent sample.

Gender is a common variable explored in infidelity literature, with some studies suggesting that men - rather than women - tend to report greater attitudes and intentions toward infidelity (Altınok &Kılıç, 2020), while others find no gender differences (Allen et al., 2005). To explore gender variations within our two studies, we include gender as a variable within our model. Age is also a common variable explored in infidelity literature,

with some literature citing that younger adults hold more positive attitudes and greater intentions to engage in infidelity when compared to older adults (Haupert et al., 2017); however, some studies find no age differences (Jackman, 2015). To account for difference in participants age, we include age as a categorical variable within our model (18-34 as 'young adult', 35-54 as 'middle aged', and 55-84 as 'older adult'). Additionally, given that study 1 is a global convenience sample, we include world region as a random effect within the model to account for regional differences.

2.2 Methods

2.2.1 Participants

For both studies, the inclusion criteria consisted of being 18 years of age or older and having the ability to read and write in English. For study one, recruitment took place between June 2021 and August 2021; participants were invited to participate via social media and psychology network advertisements. The total number of responses was 219 after removing 41 incomplete surveys our total sample consisted of 178 responses from North America (n=68; 51 women, 17 men), Western Europe (n=84; 56 women, 28 men), and South/Southeast Asia (n=26; 16 women, 10 men). Reported ages ranged from 18-84 years old, with most of the participants split between the age groups of 18-24 (22%) and 25-34 (40%). Due to age being collected as a categorical variable, we have grouped the age ranges into three concrete groups: 18-34 as 'young adult', 35-54 as 'middle aged', and 55-84 as 'older adult'. As noted above, due to the regional aspect of this convenience sample, we include region as a variable in our model (see Figure 1 for a breakdown of participant age by nation and gender).

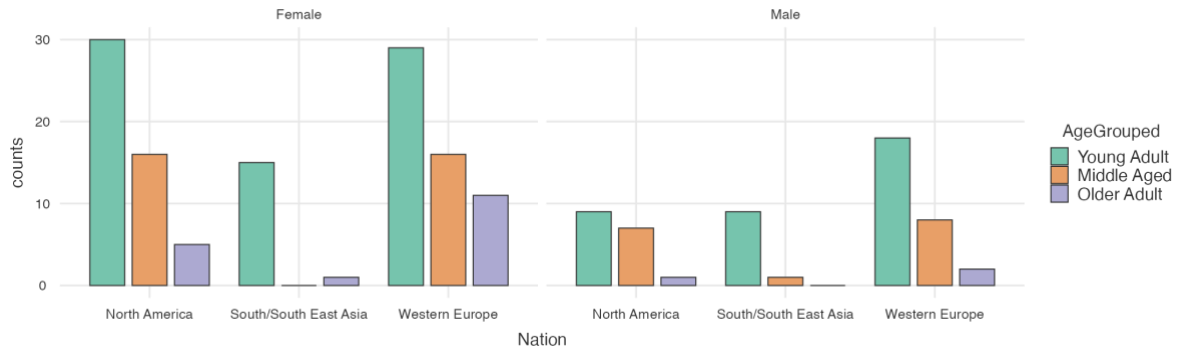


Figure 1. Descriptive statistics showcasing participant age by nation and gender.

For study two, participants were recruited via Prolific (N=182). Recruitment took place between March 2022 and July 2023. All participants resided in the United Kingdom (81 women, 101 men). Their ages ranged from 18-84 years of age, with most participants split between the age groups of 25-34 (33%) and 35-44 (29%). Due to age being collected as a categorical variable, we have grouped the age ranges into three concrete groups: 18-34 as 'young adult', 35-54 as 'middle aged', and 55-84 as 'older adult' (see Figure 2 for a breakdown of participant age by gender).

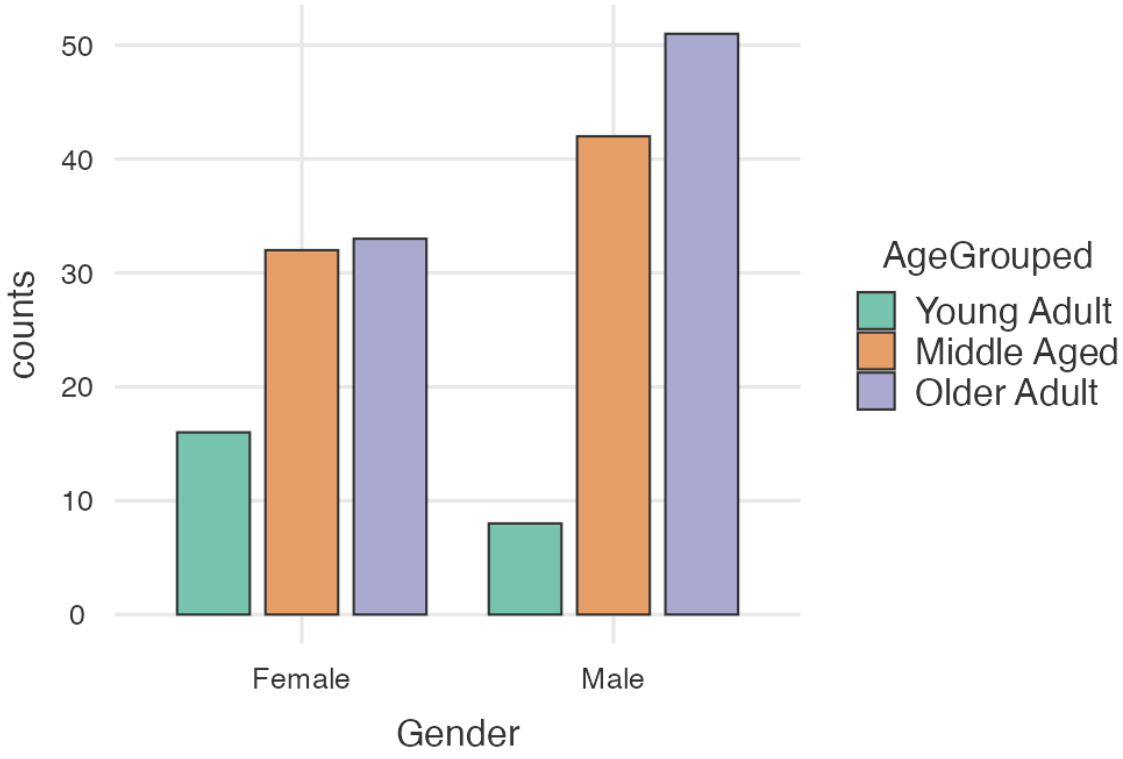


Figure 2. Descriptive statistics showcasing participant age by nation and gender.

To determine the minimum sample size required to achieve 80% power, a small-medium effect size (based on conceptually similar literature see Sevi et al., 2020 or Denes et al., 2020), and a significant alpha of .05, an a priori power analysis was conducted using G*Power 3.1 (Faul et al., 2009). For testing personality and mindset, a hierarchical linear regression with 8 predictors, the results indicated that an N of 175 would be sufficient. For sociosexuality and mindset, a regression with 6 predictors indicated that an N of 158 would be sufficient. When testing for attachment and mindset, a regression model with 5 predictors, the results indicated an N of 77 would suffice. Thus, the obtained sample size of N = 178 in study one and N = 182 in study two should provide us with sufficient statistical power to

detect the proposed effects in our hypotheses. As attachment style was only measured for individuals in a committed relationship, the obtained sample size of N = 92 in studies one and two should also provide us with sufficient power.

2.2.2 Procedure and Materials

An anonymous Qualtrics link was embedded in the advertisement - either available via social media or Prolific - where the participant was instructed to read the participant information sheet, describing study aims, procedure, as well as confidentiality and data protection plans, and sign the informed consent form. Those who agreed to participate in the study were then granted access to complete the study. Participants reported demographic information and completed measures of tight-loose mindset, romantic attachment, sociosexuality, personality, attitudes towards infidelity, and intentions towards infidelity. Other personality and sexual education questionnaires were included in the survey but are part of a separate study (Agtarap & Adair, 2023); as such, the data are not analyzed or reported here. On average, the survey was completed in less than 30 minutes. Upon completion of the survey, participants in study one were able to enter their email for the chance to win one of two Amazon vouchers worth £25 each, and participants in study two were paid at a rate of £10 an hour via Prolific payment.

2.2.2.1 Mindset

To assess mindset, the tightness-looseness mindset scale (Gelfand et al., 2011) was modified using individual-level items from Gelfand's (2021) “Mindset Quiz: How Tight or Loose Are You?”. Specifically, the scale was developed by modifying one item from Gelfand and colleagues’ work in 2011 from the country level (e.g., “There are many social norms that people are supposed to abide by in this country”) to the individual level (e.g., “I abide by the social norms that are present in the country that I currently reside in”) and using five items from Gelfand’s individualized quiz (e.g., “I stick to the rules”; 2021). Each individualized item from the quiz was selected to closely align with the remaining five items within Gelfand’s well-used and validated cultural mindset scale (Gelfand et al., 2011), representing an effort to modify their validated 6-item scale (see Appendix A, Table 1). Participants were asked to rate how each statement represented their own mindset on a scale from 1 (strongly disagree) to 7 (strongly agree). Composite scores were created by averaging responses across all six items. The higher the participant scored, the ‘tighter’ their mindset (e.g., greater

adherence to social norms); the lower the score, the 'looser' the mindset (e.g., lesser adherence to social norms). Internal consistency reliability was low for study 1 but acceptable for study 2 (study 1: *α = .53, M = 4.38, SD = .63*; study 2: *α = .65, M = 4.51, SD = .66)*. While estimates of reliability were low for study 1, Cronbach's α values in this study are consistent with those found by previous researchers who employed the same tightness-looseness scale modified for sexuality norms (Jamshed et al., 2022) and gender norms (Wormley et al., 2021). Furthermore, previous research demonstrates the reliability and validity of the original scale (Kim et al., 2022; Liu & Xiaoyuan, 2023; Marcus et al., 2022). In addition to Cronbach Alpha, a Confirmatory Factor Analysis (CFA) was conducted to further test the reliability of the scale. Significant factor loadings for study 1 ranged from .35 to 1.1, whereas significant factor loadings for study 2 ranged from .39 to .76 (see Appendix A, Table 2 for each respective item and their corresponding factor loadings). As indicated by the Cronbach alpha values, measure fit was overall poor as our results do not meet the traditional cut-offs used in empirical studies (McNeish & Wolf, 2023) such as CFI ≥ .96, TLI ≥ .90, and RMSEA ≤ .06. Notably, and as seen by the alphas, the results were stronger for study 2 (a UK based sample) in comparison to study 1 (an international sample; see Table 1).

Table 1. *Confirmatory Factory Analysis: Model Fit*

Test for Exact Fit					
	χ^2	**df**	**p**		
Study 1:	45.189	9	<.001		
Study 2:	44.757	9	<.001		
Fit Measures					
				RMSEA 90% CI	
	CFI	**TLI**	**RMSEA**	**Lower**	**Upper**
Study 1:	.667	.445	.150	.108	.195
Study 2:	.826	.711	.148	.106	.192

2.2.2.2 Personality

To assess personality, the Ten-Item Personality Inventory was used (TIPI; Gosling, Rentfrow, & Swann, 2003), consisting of 10 items assessing the participant's personality via Big Five Factors. Each factor (Openness, Conscientiousness, Extraversion, Agreeableness, and Emotional Stability) is assessed in two items, and each item has two traits. For example,

to assess extraversion, participants indicate the extent to which two pairs of traits (i.e., "*extraverted, enthusiastic"* and "*reserved, quiet"*) apply to themselves on a scale from 1 (disagree strongly) to 7 (agree strongly). The factor(s) with the highest score was then considered the trait that best represented the participant's personality. Internal reliability scores were calculated for each factor: Openness (study 1: *α = .41, M = 5.06, SD = 1.21*; study 2: *α = .47, M = 4.66, SD = 1.14*), Conscientiousness (study 1: *α = .52, M = 5.16, SD = 1.16*; study 2: *α = .51, M = 5.06, SD = 1.19*), Extraversion (study 1: *α = .69, M = 3.82, SD = 1.53*; study 2: *α = .73, M = 3.47, SD = 1.49*), Agreeableness (study 1: *α= .35, M = 4.91, SD = 1.14*; study 2: α = *.34, M = 5.12, SD = 1.09)*, Emotional Stability (study 1: *α = .59, M = 4.03, SD = 1.30*; study 2: *α = .80, M = 4.28, SD = 1.52*). As the number of items strongly affects indices of internal consistency reliability, it is worth noting that other studies report similar Cronbach's α values (Ellen et al., 2022; Shi, Li, Chen, 2022) and find that these subscales demonstrate appropriate reliability and validity (Ellen et al., 2022).

2.2.2.3 Adult Attachment

To assess adult attachment style, we used the Experience in Close Relationship Scale - Short form (ECR-S; Wei et al., 2007). This 12-item scale was used to assess the extent to which participants endorse avoidant or anxious attachment patterns in their current relationships (e.g., "I try to avoid getting too close to my partner" on a scale from 1 "strongly disagree" to 5 "strongly agree"), and as such only participants who reported being in a "serious/romantic relationship" or were "engaged/married" were directed to this portion of the survey (n=92/n=92). Responses were averaged to create a composite score for the avoidance (study 1, *α= .82, M = 1.90, SD = .77*; study 2, *α = .80, M = 1.81, SD = .65)* and anxious subscales (study 1: *α = .68, M = 2.84, SD = .80*; study 2: *α = .75, M = 2.80, SD = .83*).

2.2.2.4 Sociosexuality

To assess sociosexuality, the Sociosexual Orientation Inventory was used (SOI-R; Penke & Asendorpf, 2008). This 9-item measure comprises three subscales sexual behaviors (e.g., "with how many different partners have you had sex on one and only one occasion?" on a scale from 1 "0" to 5 "8 or more"), attitudes (e.g., "sex without love is OK" on a scale from 1 "strongly disagree" to 5 "strongly agree"), and desires (e.g., "how often do you have spontaneous fantasies about having sex with someone you have just met?" on a scale from 1 "never" to 5 "nearly every day"), which place participants on a spectrum from restricted to

unrestricted sociosexuality. Composite scores were created by averaging responses across items within the same subscale, such that higher values are indicative of more unrestricted sociosexuality. Good internal reliability was achieved for all subscales: behaviors (study 1: *α = .77, M = 2.23, SD = 1.02*; study 2: *α = .69, M = 2.18, SD = .90*), attitudes (study 1: *α = .81, M = 3.28, SD = 1.19*; study 2: *α = .76, M = 3.30, SD = 1.05*), desires (study 1: *α = .88, M = 2.39, SD = 1.04*; study 2: *α = .86, M = 2.45, SD = 1.00*).

2.2.2.5 Attitudes & Intentions Toward Infidelity

All participants filled out two scales associated with infidelity. One scale measured their attitudes towards infidelity, whereas the other measured their intentions in relation to infidelity. The Attitudes Toward Infidelity Scale (Whatley, 2006) is a 12-item measure assessing how people think and feel about issues associated with infidelity. Participants indicated their degree of agreement with statements like "I would not mind if my significant other had an affair as long as I did not know about it." on a scale from 1 (strongly disagree) to 7 (strongly agree). After reverse scoring, a composite score was calculated by averaging responses across all 12 items such that a higher score represented a greater acceptance of infidelity. Good internal reliability was achieved for this scale (study 1: *α = .84, M = 2.40, SD = .95*; study 2: *α = .82, M = 2.22, SD = .81*).

The Intentions Towards Infidelity Scale (Fisher et al., 2011) is a 7-item measure assessing how likely a person is to be unfaithful to their partner. Participants responded to items such as "How likely are you to be unfaithful to a partner if you knew you wouldn't get caught?" on a scale from -3 (extremely unlikely) to +3 (extremely likely). Responses were averaged to create a composite score such that higher values indicate greater intentions for infidelity. Again, good internal reliability was achieved for this scale (study 1: *α = .79, M = 2.38, SD = 1.17*; study 2: *α = .81, M = 2.35, SD = 1.18*).

2.3 Results

2.3.1 Hypothesis 1: Studies 1 and 2

Before testing the hypotheses, I conducted a series of Pearson Correlation analyses to confirm relationships between our predictor variables of personality, attachment, sociosexuality, and mindset and our outcome variables, attitudes and intent towards infidelity (see Table 2). As expected, the scales for measuring intentions and attitudes towards infidelity were strongly correlated (study 1: $r(176) = .64$, $p < .001$, 95% CI [.54, .72]; study 2:

r(180) = .63, p < .001, 95% CI [.54, .71]). These initial correlations ensure the researcher that the infidelity scales were valid and reliable amongst the given sample population, as they are critical for testing the first hypothesis.

Table 2. *Correlations between predictor variables and outcome variables of interest.*

	Infidelity: Intentions		**Infidelity: Attitudes**		**Mindset**	
	Study 1	*Study 2*	*Study 1*	*Study 2*	*Study 1*	*Study 2*
Mindset	-.23*	-.17*	-.25**	-.30***	-	-
Openness	-.01	.03	.08	.01	-.019	-.190*
Conscientiousness	-.18*	-.17*	-.26***	-.27***	.312***	.398***
Extraversion	.06	.03	.09	.05	-.170*	-.086
Agreeableness	-.15*	-.19*	-.11	-.30***	.168*	.374***
Emotional Stability	.04	-.03	.01	.01	.210**	.434***
SOI: Behavior	.13	.25***	.18*	.10	-.197**	-.124
SOI: Attitudes	.25***	.42***	.34***	.22**	-.154*	-.171*
SOI: Desires	.35***	.56***	.46***	.35***	-.145	-.142
Avoidance	.48***	.39***	.24*	.35***	-.254*	-.166
Anxious	.03	.14	.00	.13	-.050	-.295**

n=178/n=182 for TIPI & SOI, n=92/n=92 for ECR-S
*p<.05 **p<.01 ***p<.001

Note. Color coded heat map of correlational matrix, darker red indicates a significant negative correlation, light pink indicates no significant correlation, and purple indicates a significant positive correlation.

To test the first hypothesis [H1], *individuals with looser mindsets will report more positive infidelity attitudes and intentions*, a Pearson correlation analysis was conducted between mindset, intentions towards infidelity, and attitudes towards infidelity. The results concluded that we can reject the null hypothesis as those who reported looser mindsets were likely to report more positive intentions (study 1: *r*(176) = -.23, p = .002, 95% CI [-.36, -.08]; study 2: *r*(180) = -.17, p = .02, 95% CI [-.31, -.03]) and attitudes towards infidelity (study 1:

r(176) = -.25, p = .007, 95% CI [-.38, -.11]; study 2: *r*(180) = -.30, p < .001, 95% CI [-.42, -.16]).

2.3.2 Hypothesis 2

Hypothesis 2 (H2) comprises three components: looser mindsets are expected to contribute significantly to predicting attitudes and intentions towards infidelity in the presence of personality traits [a], sociosexuality [b], and attachment styles [c]. In Study 1, the primary researcher employed a series of linear mixed-effect models to assess each component (see Table 3 for a summary of results). The fixed effects included hypothesized predictors (age, gender, SOI/personality/attachment, and mindset). To address data non-independence by region, a random effect was incorporated. For Study 2, linear regression models were used since all participants resided in the UK, eliminating the need to account for nation-based clustering. Additionally, nested model comparisons were conducted to assess model fit for both studies, considering all independent variables (personality, sociosexuality, and attachment) and each dependent variable measuring infidelity (attitudes and intentions). Hypothesis 2 will be supported if the nested model comparisons indicate that the more complex model, incorporating mindset, adds significant explanatory value. See Appendix A for QQ plots of residuals for each independent model.

2.3.2.1 Study 1

Personality & Mindset [H2a]

We employed a linear mixed-effect model to explore the relationship between personality, mindset, and infidelity (attitudes and intentions). Notably, due to the absence of a significant correlation between many of the Big Five personality traits and our infidelity measures (see Table 2), subsequent attitudes toward infidelity analysis focus solely on conscientiousness, whereas intentions toward infidelity analysis will include conscientiousness and agreeableness.

The initial linear mixed-effect model for attitudes toward infidelity, including gender and age categories, revealed a significant main effect of gender, with males exhibiting more favorable attitudes towards infidelity (b = .66, SE = .15, t(173.87) = 4.41, p < .001). Building upon this, model two incorporated personality (conscientiousness), which indicated a

significant main effect for gender, with males reporting more positive attitudes towards infidelity ($b = .58$, $SE = .15$, $t(172.56) = 3.99$, $p < .001$) and lower levels of conscientiousness being a significant predictor of attitudes towards infidelity ($b = -0.20$, $SE = 0.05$, $t(172.87) = -3.37$, $p < .001$). The third model, which introduced mindset as an additional predictor, produced a significant main effect for gender, with males indicating more favorable attitudes towards infidelity ($b = 0.58$, $SE = 0.14$, $t(171.71) = 4.06$, $p < .001$), lower conscientiousness ($b = -.15$, $SE = .06$, $t(171.17) = -2.75$, $p = .015$) and mindset, indicating that people with a looser mindset reported more positive attitudes towards infidelity ($b = -0.30$, $SE = 0.11$, $t(171.95) = -2.75$, $p = .007$).

The initial linear mixed-effect model for intentions toward infidelity, including gender and age categories, revealed a significant main effect of gender, indicating that males exhibited higher intentions to cheat ($b = 0.50$, $SE = 0.19$, $t(174) = 2.66$, $p < .001$). Building upon this, model two incorporated personality (conscientiousness and agreeableness) which indicated a significant main effect for gender, with males holding greater intentions toward infidelity ($b = .42$, $SE = .19$, $t(172) = 2.22$, $p = .028$) and conscientiousness ($b = - 0.16$, $SE = 0.08$, $t(172) = - 2.10$, $p = .037$), with individuals reporting lower levels of conscientiousness holding greater intentions towards infidelity. The third model, which introduced mindset as an additional predictor, produced a significant main effect for gender, with greater intentions in males ($b = .58$, $SE = .14$, $t(171.71) = 4.06$, $p < .001$), a significant main effect of conscientiousness, with lower conscientiousness associated with greater intent ($b = - 0.15$, $SE = 0.06$, $t(171.17) = -2.47$, $p = .015$) and mindset, such that looser mindsets held greater intentions towards infidelity ($b = -0.30$, $SE = 0.11$, $t(171.95) = -2.75$, $p = .007$), with individuals with a looser mindset being more likely to hold greater intentions towards infidelity.

To assess which model best fit the data, a likelihood ratio test compared model two and model three. The results indicated a significant enhancement in fit for model three for both attitudes ($\chi^2(1) = 7.82$, $p = .005$) and intentions towards infidelity ($\chi^2(1) = 5.68$, $p = .017$), signifying that the inclusion of mindset significantly contributed to explaining variability in both attitudes and intentions towards infidelity beyond personality. In support of H2a, the linear mixed-effect models suggest that mindset adds significant value to the overall model when predicting attitudes and intentions towards infidelity. Furthermore, the nested model comparison underscores the importance of mindset as a predictor variable, establishing

it as the preferred model for both infidelity attitudes and intentions; thus, rejecting the null hypothesis.

*Sociosexuality & Mindset [H2b]*We employed a linear mixed-effect model to explore the relationship between sociosexuality, mindset, and infidelity (attitudes and intentions). Notably, due to the absence of a significant correlation between sociosexual behaviors (SOI) and intentions towards infidelity, subsequent intentions toward infidelity analysis focus solely on SOI attitudes and desires.

The initial linear mixed-effect model for attitudes towards infidelity, including gender and age categories, revealed a significant main effect of gender, with males exhibiting more favorable attitudes towards infidelity ($b = .66$, $SE = .15$, $t(173.87) = 4.41$, $p < .001$). Model two incorporated sociosexuality (behaviors, attitudes, and desires), which produced a significant main effect of gender, with males exhibiting more positive attitudes ($b = .38$, $SE = .14$, $t(171) = 2.67$, $p = .008$), SOI attitudes ($b = .13$, $SE = .07$, $t(170.50) = 2.01$, $p = .05$), and SOI desires ($b = .34$, $SE = .07$, $t(168.82) = 4.60$, $p < .001$). Lastly, the third model, which introduced mindset as an additional predictor, produced a significant main effect for gender, with males emerging as significant ($b = .38$, $SE = .14$, $t(169.91) = 2.76$, $p = .006$), SOI desires ($b = .33$, $SE = .72$, $t(167.76) = 4.55$, $p < .001$), and for mindset ($b = -.30$, $SE = .10$, $t(168.37) = -3.02$, $p = .003$).

The initial linear mixed-effect model for intentions toward infidelity, including gender and age categories, revealed a significant main effect of gender, indicating that males exhibited higher intentions to cheat ($b = 0.50$, $SE = 0.19$, $t(174) = 2.66$, $p < .001$). Building upon this, model two incorporated sociosexuality (attitudes and desires), which indicated a significant main effect for SOI desires ($b = 0.32$, $SE = 0.10$, $t(170.11) = 3.32$, $p < .001$). The third model, which introduced mindset as an additional predictor, produced a significant main effect for SOI desires ($b = 0.30$, $SE = 0.10$, $t(169.09) = 3.17$, $p < .001$) and mindset ($b = -0.34$, $SE = 0.13$, $t(168.72) = -2.54$, $p = .012$).

To assess which model best fit the data, a likelihood ratio test compared model two and model three. The results indicated a significant enhancement in fit for model three for both attitudes ($\chi^2(1) = 9.58$, $p = .002$) and intentions towards infidelity ($\chi^2(1) = 6.68$, $p = .009$), signifying that the inclusion of mindset significantly contributed to explaining variability in both attitudes and intentions towards infidelity beyond sociosexuality. In

support of H2b, the linear mixed-effect models suggest that mindset adds significant value to the overall model when predicting attitudes and intentions towards infidelity. Furthermore, the nested model comparison underscores the importance of mindset as a predictor variable, establishing it as the preferred model for both infidelity attitudes and intentions, rejecting the null hypothesis.

Attachment & Mindset [H2c]

We employed a linear mixed-effect model to explore the relationship between attachment, mindset, and infidelity (attitudes and intentions). Notably, due to the absence of a significant correlation between anxious attachment and attitudes and intentions towards infidelity (see Table 2), the subsequent analyses focus solely on attachment avoidance.

The initial linear mixed-effect model for attitudes towards infidelity, including gender and age categories, revealed a significant main effect of gender, with males exhibiting more favorable attitudes towards infidelity ($b = .71$, $SE = .22$, $t(87.44) = 3.23$, $p = .002$). Model two, incorporating attachment avoidance, produced a significant main effect of gender, with males exhibiting more positive attitudes ($b = .72$, $SE = .22$, $t(86.45) = 3.34$, $p = .001$) and avoidance attachment, such that higher scores on avoidant were greater predictors of attitudes towards infidelity ($b = .29$, $SE = .13$, $t(85.76) = 2.31$, $p = .022$). Lastly, the third model, which introduced mindset as an additional predictor, only produced a significant main effect for gender, with males emerging as significant ($b = .70$, $SE = .22$, $t(85.63) = 3.27$, $p = .002$); whereas attachment avoidance ($b = .24$, $SE = .13$, $t(85.33) = 1.85$, $p = .068$), and mindset ($b = -.24$, $SE = .16$, $t(84.10) = -1.52$, $p = .132$) failed to emerge as significant predictors of attitudes towards infidelity.

The initial linear mixed-effect model for intentions toward infidelity, including gender and age categories, revealed a significant main effect of age, such that younger adults (between 18-34 years old) were greater predictors of intentions towards infidelity ($b = - 0.55$, $SE = 0.26$, $t(88) = -2.11$, $p = .038$). Building upon this, model two incorporated avoidance attachment, and produced a significant main effect for attachment, such that higher scores on avoidance attachment were greater predictors of intentions toward infidelity ($b = 0.65$, $SE = 0.13$, $t(87 = 4.99$, $p < .001$). The third model, which introduced mindset as an additional predictor, only produced a significant main effect for avoidance attachment ($b = 0.59$, $SE =$

0.17, t(86) = 4.40, p < .001); whereas mindset failed to emerge as significant main effect (b = -0.28, SE = 0.17, t(86) = -1.69, p = .095).

Provided neither model for infidelity, attitudes or intentions, emerged as significant when adding in the predictor variable of mindset, we fail to reject the null hypothesis for H2c.

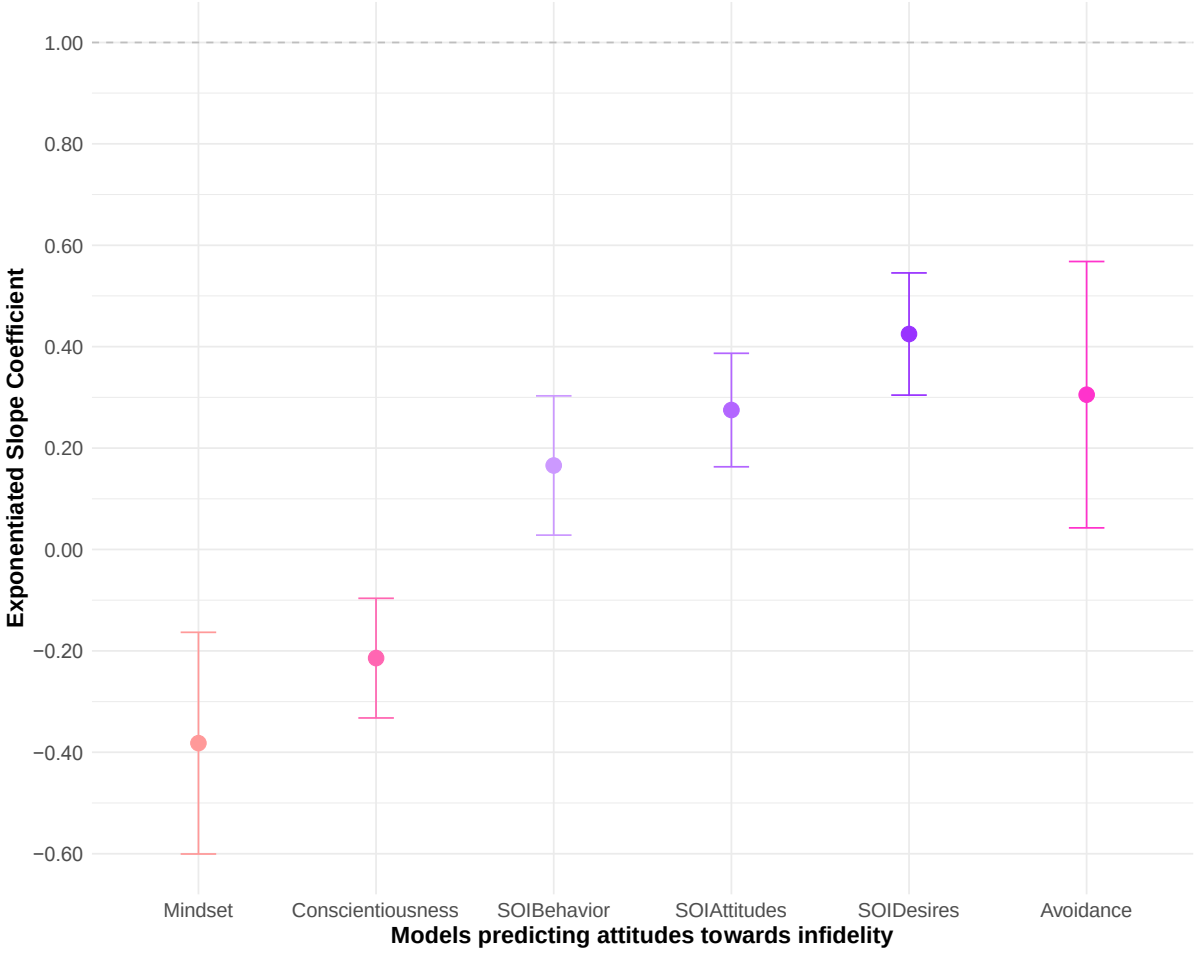


Figure 3. Exponentiated slope coefficients from regression models predicting attitudes towards infidelity (study 1 - mindset, conscientiousness, and SOI n = 178; avoidance n = 92).

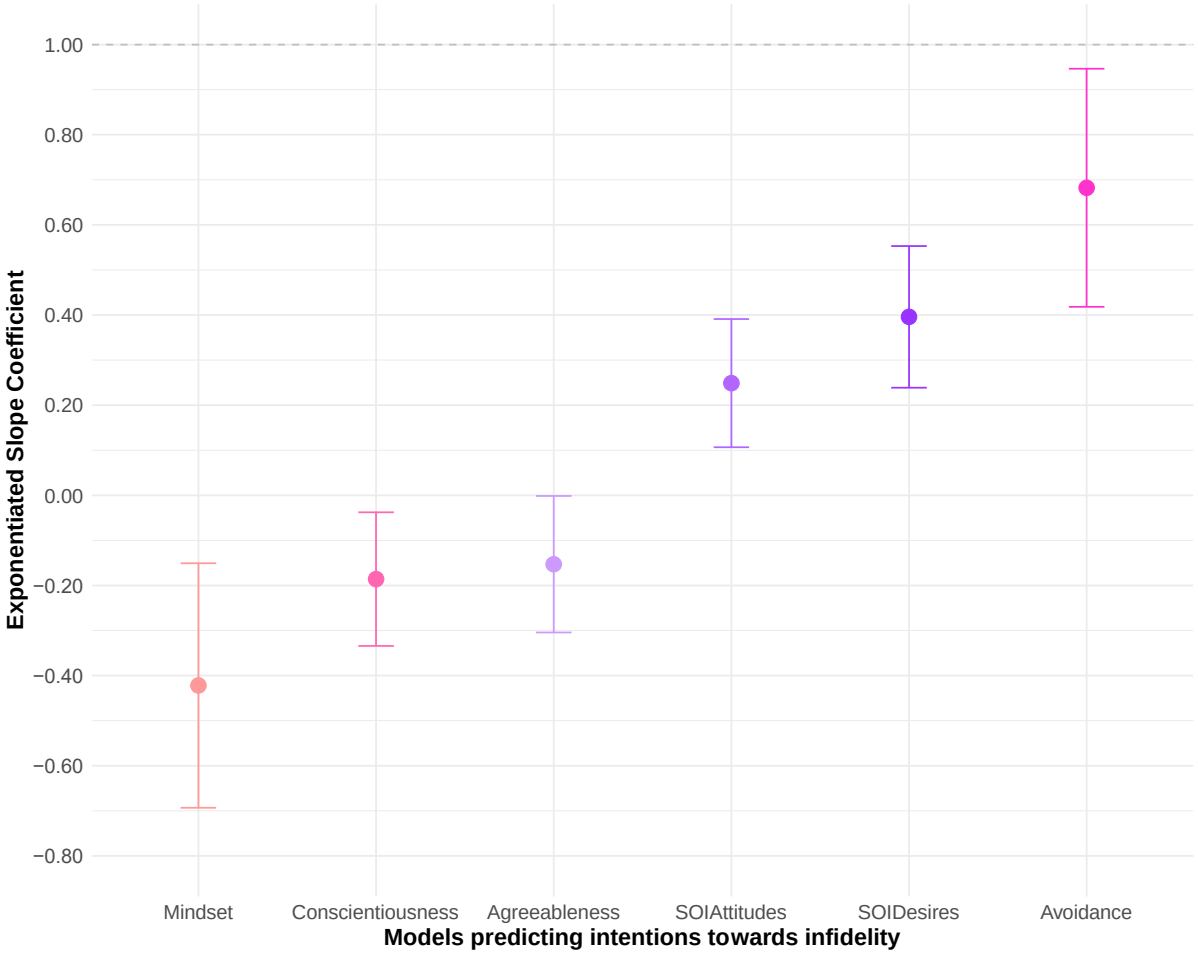


Figure 4. Exponentiated slope coefficients from regression models predicting intentions towards infidelity (study 1 - mindset, conscientiousness, agreeableness and SOI n = 178; avoidance n = 92).

2.3.2.2 Study 2

*Personality & Mindset [H2a]*We employed a linear regression model to explore the relationship between personality, mindset, and infidelity (attitudes and intentions). Notably, due to the absence of a significant correlation between many of the Big Five personality traits and our infidelity measures (see Table 2), subsequent attitudes and intentions toward infidelity analyses focus solely on conscientiousness and agreeableness.

The initial regression model for attitudes toward infidelity, including gender and age categories, revealed a significant main effect of age, such that older adults (55-84 years old) were greater predictors for attitudes towards infidelity ($b = .38$, $SE = .19$, $t(178) = 1.97$, $p = .050$). Building upon this, model two incorporated personality (conscientiousness and agreeableness), which indicated a significant main effect for age, with older adults being a significant predictor of attitudes toward infidelity ($b = .61$, $SE = .18$, $t(176) = 3.38$, $p < .001$),

lower levels of conscientiousness (b = -0.18, SE = 0.05, t(176) = - 3.92, p < .001) and agreeableness (b = -.19, SE = .52, t(176) = -3.62, p = .004) being significant predictors of attitudes towards infidelity. The third model, which introduced mindset as an additional predictor, produced a significant main effect for age, such that older adults were significant predictors of attitudes towards infidelity (b = 0.60, SE = 0.18, t(175) = 3.41, p = .008), lower conscientiousness (b = -.14, SE = .05, t(175) = -2.94, p = .004) and agreeableness (b = -.23, SE = .09, t(175) = -.266, p = .008), and for mindset, such that people with a looser mindset reported more positive attitudes towards infidelity (b = -0.23, SE = 0.09, t(175) = -2.41, p = .017).

The initial linear regression model for intentions toward infidelity, including gender and age categories, revealed a significant main effect of gender, such that males exhibited higher intentions to cheat (b = 0.44, SE = 0.18, t(178) = 2.46, p < .015). Building upon this, model two incorporated personality (conscientiousness and agreeableness) which indicated a significant main effect for gender, with males holding greater intentions toward infidelity (b = .37, SE = .18, t(176) = 2.10, p = .037) and conscientiousness (b = - 0.17, SE = 0.07, t(176) = - 2.38, p = .019), with individuals reporting lower levels of conscientiousness holding greater intentions towards infidelity. The third model, which introduced mindset as an additional predictor, only produced a significant main effect for gender, with greater intentions in males (b = .51, SE = .18, t(175) = 2.22, p = .028); however, mindset failed to emerge as a significant predictor (b = -0.19, SE = 0.15, t(175) = -1.32, p = .190).

To determine the model that better captured the data, a nested model comparison was conducted between model two and model three. The results revealed a statistically significant improvement in fit for model three concerning attitudes towards infidelity (F(1,175) = 5.80, p = .017). However, this enhancement was not observed for intentions towards infidelity (F(1,175) = 2.19, p = .190). These findings indicate that the inclusion of mindset significantly contributes to explaining variability in attitudes towards infidelity beyond personality factors, while no such significant contribution was observed for intentions towards infidelity. In partial support of H2a, the linear regression model suggests that mindset adds significant value to the overall model when predicting attitudes towards infidelity. Furthermore, the nested model comparison underscores the importance of mindset as a predictor variable, establishing it as the preferred model for infidelity attitudes. We fail to reject the null for significance value added for mindset and intentions toward infidelity.

Sociosexuality & Mindset [H2b]

We employed a linear regression model to explore the relationship between sociosexuality, mindset, and infidelity (attitudes and intentions). Notably, due to the absence of a significant correlation between sociosexual behaviors (SOI) and intentions towards infidelity, subsequent intentions toward infidelity analysis focus solely on SOI attitudes and desires.

The initial linear regression model for attitudes towards infidelity, including gender and age categories, revealed a significant main effect of age, such that older adults (55-84 years old) were greater predictors for attitudes towards infidelity ($b = .38$, $SE = .19$, $t(178) = 1.97$, $p = .050$). Model two incorporated sociosexuality (behaviors, attitudes, and desires), which produced a significant main effect of age, such that older adults were greater predictors of positive attitudes towards infidelity ($b = .46$, $SE = .18$, $t(175) = 2.54$, $p = .012$) and SOI desires ($b = .26$, $SE = .07$, $t(175) = 4.00$, $p < .001$). Lastly, the third model, which introduced mindset as an additional predictor, produced a significant main effect for age, such that older adults are significant predictors of attitudes towards infidelity ($b = .52$, $SE = .17$, $t(174) = 3.00$, $p = .003$, SOI desires ($b = .23$, $SE = .06$, $t(174 = 3.74$, $p = .002$), and for mindset, such that looser mindsets are significant predictors of attitudes towards infidelity ($b = -.34$, $SE = .08$, $t(174) = -4.20$, $p < .001$).

The initial linear regression model for intentions toward infidelity, including gender and age categories, revealed a significant main effect of gender, such that males exhibited higher intentions to cheat ($b = 0.44$, $SE = 0.18$, $t(178) = 2.46$, $p < .015$). Building upon this, model two incorporated sociosexuality (attitudes and desires), which indicated a significant main effect for age, such that older adults (55-84) were significant predictors intentions toward infidelity ($b = .49$, $SE = .23$, $t(176) = 2.16$, $p = .032$) and SOI attitudes ($b = .24$, $SE = .08$, $t(176) = 3.165$, $p = .002$) and SOI desires ($b = 0.56$, $SE = 0.8$, $t(176) = 6.67$, $p < .001$), such that higher SOI attitudes and desires were significant predictors of intentions toward infidelity. The third model, which introduced mindset as an additional predictor, produced a significant main effect age, such that older adults were significant predictors of intentions toward infidelity, SOI attitudes ($b = .55$, $SE = .08$, $t(175) = 2.97$, $p = .003$) and SOI desires (b

= 0.54, SE = 0.08, t(175) = 6.51, p < .001), but not for mindset (b = -0.17, SE = 0.11, t(175) = -1.54, p = .126).

To determine the model that better captured the data, a nested model comparison was conducted between model two and model three. The results revealed a statistically significant improvement in fit for model three concerning attitudes towards infidelity (F(1,174) = 17.65, p < .001). However, this enhancement was not observed for intentions towards infidelity (F(1,175) = 2.36, p = .127). These findings indicate that the inclusion of mindset significantly contributes to explaining variability in attitudes towards infidelity beyond sociosexuality while no such significant contribution was observed for intentions towards infidelity. In partial support of H2b, the linear regression model suggests that mindset adds significant value to the overall model when predicting attitudes towards infidelity. Furthermore, the nested model comparison underscores the importance of mindset as a predictor variable, establishing it as the preferred model for infidelity attitudes. We fail to reject the null for significance value added for mindset and intentions toward infidelity.

Attachment & Mindset [H2c]

We employed a linear regression model to explore the relationship between sociosexuality, mindset, and infidelity (attitudes and intentions). Notably, due to the absence of a significant correlation between anxious attachment and infidelity (see Table 2), subsequent analyses for infidelity attitudes and intentions focus solely on attachment avoidance.

The initial linear regression model for attitudes towards infidelity, including gender and age categories, revealed a significant main effect of age, such that older adults (55-84 years old) were greater predictors for attitudes towards infidelity (b = .38, SE = .19, t(87) = 1.97, p = .050). Model two incorporated attachment avoidance which produced a significant main effect of attachment, such that greater attachment avoidant scores were significant predictors of attitudes towards infidelity (b = .48, SE = .12, t(87) = 3.91, p < .001). Lastly, the third model, which introduced mindset as an additional predictor, produced a significant main effect for age, such that older adults are significant predictors of attitudes towards infidelity (b = .48, SE = .24, t(86) = 2.01, p = .047), attachment avoidance (b = .41, SE = .12, t(86) =

3.51, $p < .001$), and for mindset, such that looser mindsets are significant predictors of attitudes towards infidelity ($b = -.48$, $SE = .15$, $t(86) = -3.28$, $p = .001$).

The initial linear regression model for intentions toward infidelity, including gender and age categories, revealed a significant main effect of gender, such that males exhibited higher intentions to cheat ($b = 0.44$, $SE = 0.18$, $t(87) = 2.46$, $p = .015$). Building upon this, model two incorporated avoidant attachment which indicated a significant main effect of attachment, such that greater attachment avoidance scores were significant predictors of intentions toward infidelity ($b = 0.69$, $SE = 0.16$, $t(87) = 4.25$, $p < .001$). The third model, which introduced mindset as an additional predictor, produced a significant main effect age, such that older adults were significant predictors of intentions toward infidelity ($b = .81$, $SE = .33$, $t(86) = 2.47$, $p = .012$), attachment avoidance ($b = .63$, $SE = .16$, $t(86) = 3.91$, $p < .001$) and mindset, such that looser mindset scores are significant predictors of intentions toward infidelity ($b = -0.44$, $SE = 0.20$, $t(86) = -2.20$, $p = .031$).

To determine the model that better captured the data, a nested model comparison was conducted between model two and model three. The results revealed a statistically significant improvement in fit for model three concerning both attitudes ($F(1,86) = 10.79$, $p = .001$) and intentions ($F(1,86) = 4.83$, $p = .031$) towards infidelity. These findings indicate that the inclusion of mindset significantly contributes to explaining variability in attitudes and intentions towards infidelity beyond avoidance attachment. In support of H2c, the linear regression model suggests that mindset adds significant value to the overall model when predicting attitudes and intentions towards infidelity. Furthermore, the nested model comparison underscores the importance of mindset as a predictor variable, establishing it as the preferred model for infidelity attitudes and intentions.

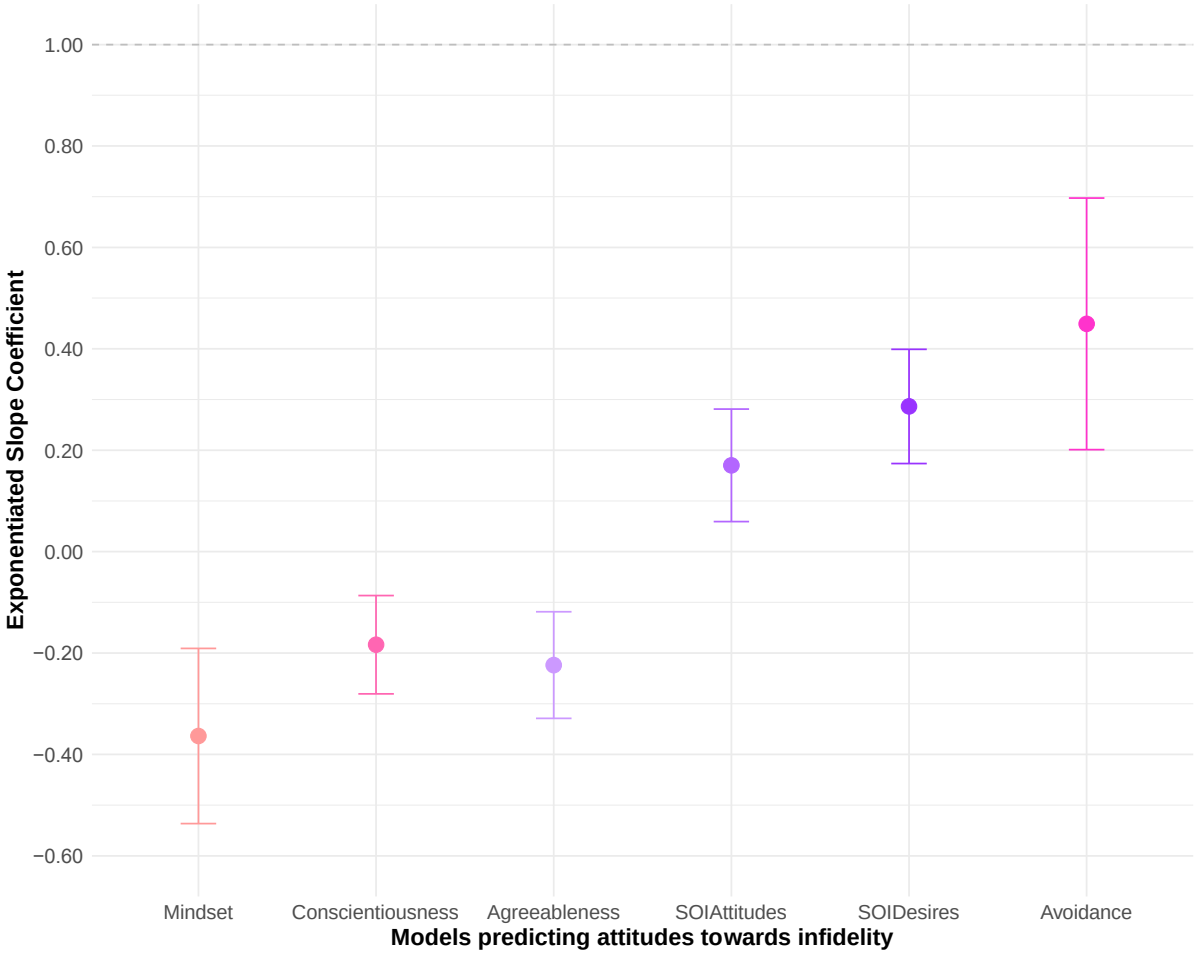


Figure 5. Exponentiated slope coefficients from regression models predicting attitudes towards infidelity (study 2, mindset, conscientiousness, agreeableness, and SOI n = 182; avoidance n = 92.

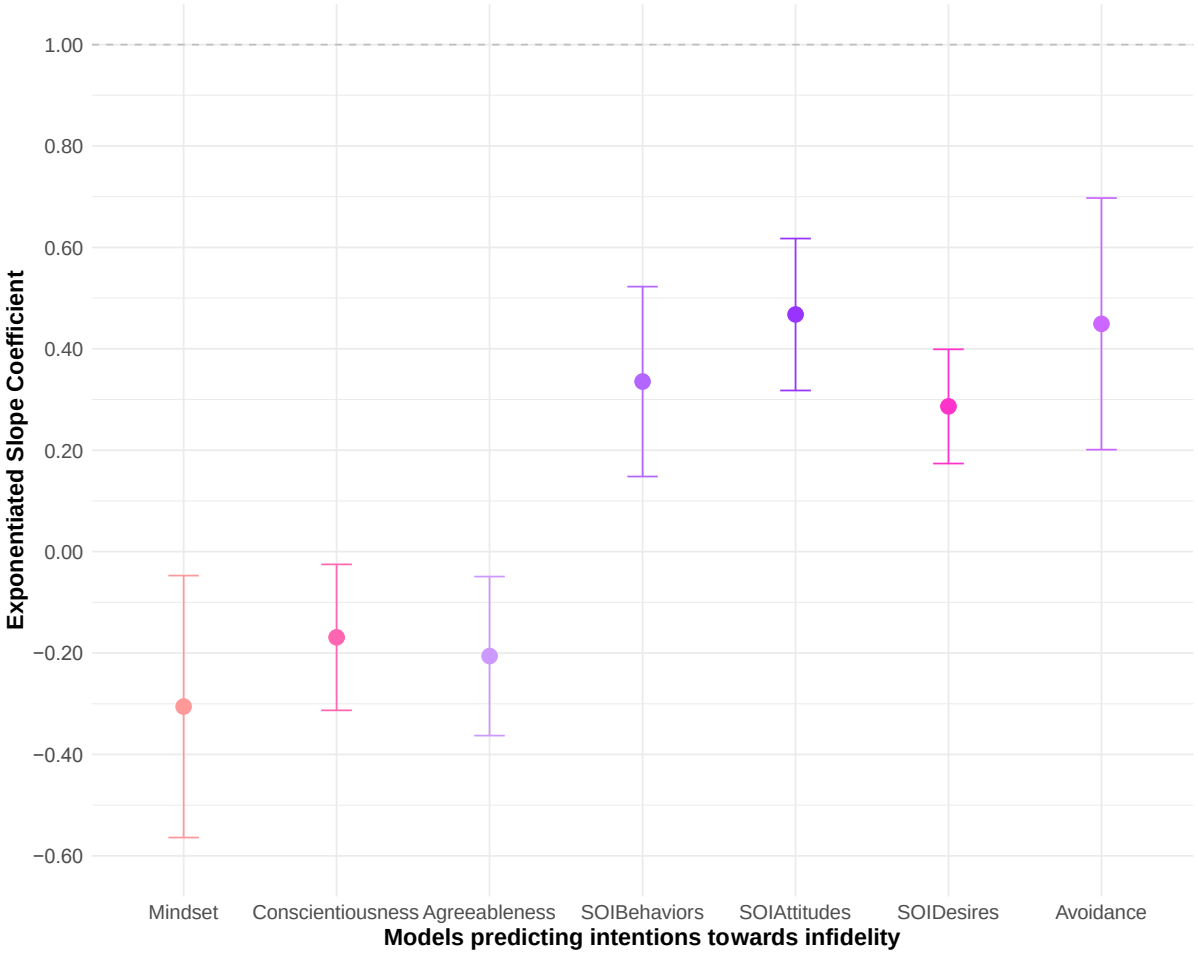


Figure 6. Exponentiated slope coefficients from regression models predicting intentions towards infidelity (study 2, mindset, conscientiousness, agreeableness, and SOI n = 182; avoidance n = 92.

Table 3. H2: Results breakdown

	Study 1	*Study 2*
Personality X Mindset:		
Infidelity: Attitudes	Yes	Yes
Infidelity: Intentions	Yes	No
Sociosexuality X Mindset:		
Infidelity: Attitudes	Yes	Yes
Infidelity: Intentions	Yes	No
Attachment X Mindset		
Infidelity: Attitudes	No	Yes
Infidelity: Intentions	No	Yes

Table showing results of H2: Does the variable of mindset add significant value to the overall predictive model?

2.4 Discussion

This manuscript investigated the relationship between mindset and infidelity attitudes and intentions. The results of both studies support H1, indicating that individuals with looser mindsets have more positive attitudes toward, and stronger intentions to engage in, infidelity. H2 was partially supported by studies one and two. In study one, mindsets added significant predictive value in models with personality and sociosexuality - when predicting attitudes and intentions towards infidelity - but not in either model with attachment. In study two, mindset added significant predictive values across all other independent variables (personality, sociosexuality, and attachment) but only for attitudes toward infidelity. With regard to H2, one finding was clearly replicated across both samples when predicting infidelity attitudes - mindset adds significant predictive value when added to models containing sociosexuality and the Big Five personality factors. These factors predicted infidelity attitudes in ways consistent with previous research, such that unrestricted sociosexuality (Weiser et al., 2018), lower conscientiousness (Mahambrey, 2020), and lower agreeableness (Schmitt & Buss, 2001) were associated with more positive attitudes towards infidelity. What is unique about this work is that it suggests that mindset adds additional predictive value above and beyond the individual-level factors of sociosexuality and personality.

Indeed, there were discrepancies between studies one and two, specifically with the predictor variable of attachment when evaluating intentions toward infidelity (see Table 3). In both studies, attachment avoidance consistently emerged as a predictor of infidelity attitudes and intentions. This aligns with recent research showing that individuals with avoidant attachment styles tend to exhibit lower commitment and more favorable infidelity attitudes (Swets & Cox, 2023). This raises an intriguing question: does attachment avoidance contribute more significantly to the explained variance compared to anxious attachment? Indeed, Uz (2014) suggests that tightness may be associated with an anxious attachment style, as tightness is characteristic of consistently seeking approval from other people. Consequently, it is plausible that tightness may represent a higher prevalence of anxious attachment styles. This implies that individuals with avoidant attachment styles may be more likely to have looser mindsets, potentially accounting for a greater portion of the explained variance in our findings. Future studies seeking to replicate this work should further delve into this intricate relationship for a more comprehensive understanding.

Concerning discrepancies between infidelity attitudes and intentions, our models successfully predicted infidelity attitudes within each analysis in both studies, except for

attachment within study one. However, our models were less successful when predicting infidelity intentions, particularly within the replication study (see Table 3). Future replications of our work should also dive into this relationship by exploring whether infidelity attitudes and intentions are predicted by different factors independently of one another or if other traits (e.g., dark triad) are confounds that account for more variance, or, could it be there is a fundamental difference between holding positive attitudes, yet those attitudes are not a full reflection of your personal behaviors or intentions to engage in infidelity? We call on future researchers to explore this relationship further.

Within our two studies on infidelity attitudes and intentions, gender differences were inconsistent. Within study one, men consistently showed more positive attitudes and intentions for infidelity. However, within study two, gender had fewer significant relationships while age – particularly older adults – held consistent significance within study two While many studies align with the findings from study one, which indicates that men tend to engage in extradyadic affairs more than women (Abbasi, 2019; Isma & Turnip, 2019), some research supports the second study's findings, where gender did not predict infidelity (Lammers & Maner, 2016). Indeed, mixed findings were also produced for the variable of age with previous studies citing no gender differences (Jackman, 2015) while other state that younger adults tended to holder greater infidelity intentions (Haupert et al., 2017). Further research should explore these discrepancies by considering theories related to the reversed double standard (Zaikman & Marks, 2017) and deeper diver into various demographic factors (e.g., socioeconomic status and age categories).

In conclusion, and to our knowledge, limited research investigates the connection between infidelity attitudes and intentions, as most of the literature focuses on these variables separately. Thus, replications and expansions of this research are deemed necessary to better understand the predictive relationship of personality, sociosexuality, attachment, and mindset concerning attitudes and intentions toward infidelity.

2.4.1 Limitations

As this study is one of the first to analyze tightness-looseness on the individual level rather than the societal or cultural level, we had to modify a previous societal level scale using non-validated items from Gelfand's 2021 Mindset Quiz. We call for additional research to further explore this scale's convergent, divergent, and predictive validity. For example, regarding convergent validity, the original and modified scale could be employed throughout

the United States - tracking similarities of the variance amongst individual and state-level tightness-looseness. We stress the importance of future researchers assisting with validating this measure on the individual-factor level to ensure appropriate reliability and validity are met. Tightness-looseness variability has been replicated and documented between nations (Gelfand et al., 2011; Uz, 2014), within nations (Harrington & Gelfand, 2014), and between men and women (Qin et al., 2023). Furthermore, researchers have explored beyond tightness-looseness cultural norms by investigating sexuality norms (Jamshed et al., 2022) and gender norms (Wormley et al., 2021). Indeed, our findings support existing meso and macro-level evidence that looser mindsets tend to be associated with less discipline, impulsivity, and an increase in risk-taking behavior (Gelfand et al., 2021). With respect to our CFA, various items did hold very strong factor loadings (i.e., items 1 and 4) and should be evaluated further to better understand how they represent tightness-looseness on the individual level. As such, we argue that despite the limitations of our study, tightness-looseness variability runs through to the mindset of the individual, which cannot always be captured by a larger sociocultural lens. Thus, our work adds a unique micro-level perspective to the existing literature on tightness-looseness and sexual risk-taking behaviors.

Our results did not replicate previous findings linking all five personality factors and infidelity (see Buss & Shackelford, 1997; Costa & McCrae, 1992; Miller et al., 2004; Schmitt, 2004). We did find that lower conscientiousness (in studies 1 and 2) and lower agreeableness (study 2) were associated with more positive attitudes and greater intentions towards infidelity. Which are consistent with research conducted by Allen and Walter (2018) and Schmitt's 2004 work that people with lower levels of these traits are more likely to cheat on their partner. However, we failed to find significant associations between openness to experiences, extroversion, emotional stability, and infidelity attitudes or intentions. These findings are consistent with Allen and Walter (2018), who found no relationship between openness and a weak relationship between extraversion and cheating behaviors. We argue it may be the case some factors are more (and others less) consistently related to these types of risk-taking outcomes.

Lastly, while convenience sampling is convenient and practical, it comes with several limitations. Indeed, convenience sampling selects participants who are easily accessible (e.g., Prolific), which incorporates a sampling bias into the design as it may not accurately reflect the broader population (Etikan et al., 2016). Likewise, the non-random nature of convenience sampling has been cited to increase the risk of making a Type 1 error, where a researcher may incorrectly conclude that there is a significant effect when there is not due to sampling bias

and lack of generalizability (Goldberg et al., 2019). Future researchers may benefit from purposive sampling within specified world regions to further replicate and validate our findings.

Despite the limitations, the results of this study contribute to the rapidly growing body of literature concerning attitudes and intentions toward infidelity. Specifically, this work demonstrates a major contribution to the field by considering the variable of mindset, which was demonstrated in two ways: H1 outlined the correlations between individuals with a looser mindset reporting more positive attitudes, and stronger intentions to engage in, infidelity, and H2 examined this relationship further by exploring the significant value added by the variable of mindset. Proposing, and replicating, novel relationships between SOI, personality, mindset, and attitudes towards infidelity. These results are critical to the field as they provide therapists and fellow relationship researchers with a new dimension when evaluating sexual risk-taking behaviors (i.e., intentions to cheat). For instance, a better understanding of how individuals with differing mindsets evaluate risk could allow for individualized treatment plans rather than a 'one-size fits all' approach. Ultimately, this research conceptualizes mindset as an individual-level difference factor, demonstrates one domain of its predictive value, and calls on future researchers to assist with fully validating the scale.

2.4.2 Conclusions

This research has enriched the field of infidelity studies by introducing a novel perspective through the lens of mindset. Our successful demonstration of its correlations with attitudes and intentions toward infidelity and our extended inquiry encompassing established frameworks involving personality, attachment, and sociosexuality traits provide meaningful insight. Such examinations of mindset contribute to preventing oversimplified generalizations, thereby improving the relevance and applicability of our findings. Additionally, our work has unveiled potential risk factors that were previously unexplored. In summary, our findings underscore the need for further exploration when assessing tightness-looseness at the individual level and within the context of romantic relationships.

Chapter 3: Healthy body, healthy mind: Exploring the mental health implications of comprehensive sex education

3.1. Introduction

Across the globe, comprehensive sex and relationship education remains a political, cultural, and educational dispute. This multifaceted dispute is highlighted within the United States of America (USA). For instance, of the 50 states, 29 hold sex education laws; of those, 19 mandate the information to be abstinence-only focused (known as abstinence-only education or AOE), and only 17 require the information to be medically accurate (Planned Parenthood Action Fund, 2022; The SIECUS State Profiles, 2023). Indicating that a mere 34% of states legislatively prioritize the medically correct delivery of sex education in schools. While the literature on AOE tends to focus on American samples, AOE is present in many contexts worldwide, including Uganda (Lewinger & Russell, 2021), Kenya and Rwanda (Gardner, 2011), Guatemala (Monzon et al., 2017), China (Aresu, 2009), and the UK (Abbott et al., 2015). Abstinence-only education (AOE) is sex education that instructs and encourages the individual to delay sexual intimacy until marriage, and information about tools and techniques to control pregnancy and the transmission of STDs/STIs is limited and/or biased to emphasize failures and risk (Leung et al., 2019). On the other hand, comprehensive education is defined by the United Nations Educational Scientific and Cultural Organization (2018) as an age-appropriate curriculum aimed at conducting formal lessons that address the psychological, biological, and social aspects of human sexuality. The overarching goals are to provide scientifically accurate and non-judgmental information (including a complete overview of contraceptives and family planning options), to help young adults form healthy relationships with their own bodies and individual identities, and to help people recognize how their behaviors impact the mental health and well-being of others (Browes, 2015; Hess, 2011). Furthermore, comprehensive education programs are typically designed to reflect sex and gender diversity; for example, including same-sex couples and people with trans, non-binary, and gender-expansive identities when highlighting examples of healthy relationships (Chavula, Zulu, & Hurtig, 2022; Goldfarb & Lieberman, 2021). Though it should be noted these are guidelines for the development of comprehensive sex education curricula, the true implementation of these curricula varies from region to region as the material included is shaped by cultural norms and practices, local legislative

policies, and the actions of relevant local councils, independent school districts, and school boards (The SIECUS State Profiles, 2023; Leung et al., 2019).

Voters and politicians likely support and promote the AOE framework in schools due to a number of factors, including political values (e.g., conservatism and right-wing authoritarianism predict sexually conservative values; Koleva et al., 2012), cultural values (e.g., cultural narratives about the sexualization of children are used to caution against sex education; Egan & Hawkes, 2008), and religious values (e.g., religious attendance and commitment predict signing and keeping abstinence pledges; Landor & Simons, 2014) that praise sexual purity and disparage casual and/or premarital sex. As an example, research in the US finds that individuals who report being politically conservative (as opposed to moderates and liberals) are more likely to agree that AOE is effective and believe that instruction about contraception (e.g., condoms) will encourage young people to have sex (Bleakley et al., 2010). However, a review of empirical evidence would suggest when an individual is provided with comprehensive sexual health knowledge, they are more equipped to tackle challenges they may face when entering adulthood (e.g., social pressures to be intimate, ending unhealthy relationships, using condoms; Seiler-Ramadas et al., 2020) and experience delayed, rather than accelerated, sexual debut (Kohler et al., 2008). Thus, with the intent to challenge conservative and abstinence-focused sex education policies and practices, researchers outline the benefits associated with scientifically accurate and comprehensive sex education programs (Smith et al., 2011). By-and-large, research on the outcomes and impact of sexual education emphasizes physical health (including lower STI transmission rates, fewer unplanned pregnancies and births, and increased condom use; Goldfarb & Lieberman, 2021) while neglecting psychological and mental health outcomes. To address this gap, we employed a qualitative survey methodology to explore people's perceptions of the mental health benefits of comprehensive sex education.

A small but growing body of literature is beginning to explore the mental health and psychological well-being implications of comprehensive sex education. While some of this work continues to focus on behavioral change (e.g., comprehensive sex education is associated with decreased rates of bullying of sexual minority students, lower unplanned pregnancy rates, and less frequent drug/alcohol use before sex; Baams, Dubas, & van Aken, 2017; Snapp et al., 2015) some of this research highlights the mental health benefits of comprehensive sex education. It is likely that this recent, increasing focus on psychological outcomes associated with comprehensive sex education reflects - at least in part - a growing appreciation for the relationship between psychological and emotional well-being and

performance in school (Amholt et al., 2020) and health organizations (World Health Organization, 2021). As an example, Proulx and colleagues (2019) find in schools offering LGTBQ+ inclusive sex education, students report fewer suicidal thoughts, and bisexual students report fewer depressive symptoms compared to students in schools without LGBTQ+ inclusive curricula. Similarly, Tordoff and colleagues (2021) find exposure to non-comprehensive and exclusionary sex education can result in distress, feelings of isolation, alienation, shame, anger, and/or dysphoria among trans and gender non-binary young adults. A recent review (Goldfarb & Lieberman, 2021) found the majority of research exploring the outcomes associated with exposure to comprehensive and accurate sex education continues to focus on behavioral and physical health outcomes (e.g., frequency of and attitudes towards intimate partner violence, conflict management and communication skills, reduced rates of child sex abuse and increased intentions to report), with a minority of studies exploring factors relevant to mental health and well-being (e.g., sexual and gender identity discrimination, bullying, and harassment). We can conclude that the potential for comprehensive and accurate sex education to facilitate changes in mental health and psychological well-being has, hitherto, been under-explored.

Therefore, this study builds upon the limited literature where few researchers have thoroughly investigated the relationship between comprehensive sex education and mental health and well-being. More specifically, this qualitative analysis explores what themes arise when individuals reflect on potential mental health and well-being outcomes from accurate and comprehensive sex education. As such, we employ an idiographic, bottom-up approach to investigate the perceived and anticipated mental health implications of comprehensive sex education.

3.2. Methods

3.2.1 Research Design

To address the research question - "what themes arise when individuals reflect on potential mental health and well-being outcomes from accurate and comprehensive sex education programs?" – a qualitative (i.e., short-answer) online survey methodology was employed. While this approach has many advantages (e.g., economical use of resources, including researcher's time and funding for participant reimbursement), it was selected as anonymity and privacy facilitates more honest and candid responses about topics participants may perceive as sensitive (Braun & Clarke, 2012).

3.2.2 Participants

Participants were recruited in three phases to ensure a sample large enough to address our research question and achieve data saturation (i.e., "the point in data collection and analysis when new information produces little or no change to the codebook"; Guest et al., 2006, pg 65). As the study aim is quite broad (i.e., to explore individuals' perceptions of the mental health outcomes of accurate and comprehensive sex education), our sample is diverse/heterogeneous with regard to their sex education experiences and history (see Figure 1), and each individual data point contains relatively little information (i.e., short-answer survey data), we anticipated that a large sample (approx. 250) was necessary to identify meaningful patterns in participant's ideas, experiences, and beliefs (see Malterud et al., 2016).

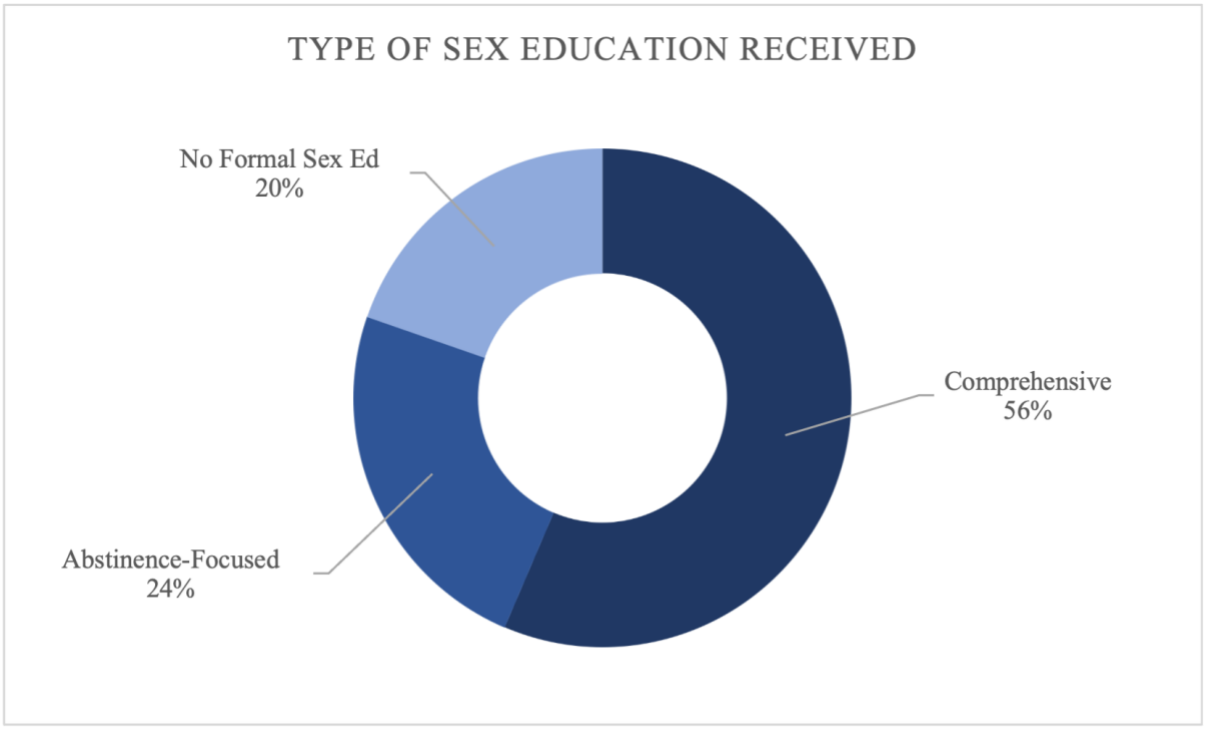


Figure 1. Demographics regarding participants' sexual education experience and history. N = 264.

The first phase of participants (N = 136) were recruited via social media adverts (e.g., Instagram and Twitter) as well as via Psychology survey webpages (e.g., Social Psychology Network and Psychological Research on the Net). Each participant had the option to enter their email for a chance to win 1 of 2 £25 Amazon vouchers. The second phase of participants were recruited through two platforms, Brunel University's Sona System (N = 39) and Prolific (N = 61). Undergraduate psychology students were reimbursed with course

credits, and Prolific participants were reimbursed £5 for their time. The last batch of participants (N = 31) were again recruited via Brunel's Sona System and received course credits. These three phases resulted in a total sample size of 267 participants ranging between 18-74 years of age, with most respondents residing in Western Europe (64%) and North America (21%), between 18-24 years old (43%) and 25-34 years old (31%); our sample was mostly heterosexual (75%), 65% identified as female and 32% as male (7 identified as non-binary and 1 preferred not to say; see Appendix B, Table 1).

3.2.3 Measures

Participants were asked to read the participant information sheet and provide written consent before completing a 15-minute online survey via Qualtrics, which was approved by the College of Health, Medicine, and Life Sciences Ethics Committee at Brunel University London. Participants used a text entry essay box to answer the main research question (i.e., "Do you believe that medically accurate sex education and STD prevention interventions could improve a person's mental health and wellbeing? Explain your reasoning in a few short sentences."). Furthermore, participants were asked to note what type of sex education they received: Comprehensive Sex Education, Abstinence-Focused Sex Education, or No Formal Sex Education (see Figure 1). They were also asked to note basic demographics (e.g., age group, ethnicity, religion, sexuality, and gender; see Appendix B, Table 1). Other quantitative and qualitative questions related to sexual behaviors, attitudes, and knowledge were included for separate analysis; thus, these data are not analyzed or reported here.

3.2.4 Qualitative Analysis

Thematic analysis (Braune & Clarke, 2012) was used to identify patterns and overall narrative structure. To allow for unique themes to emerge from the data, we used an open and data-driven inductive thematic analysis approach (Fereday & Muir-Cochrance, 2006). Following Braune and Clarke (2012), thematic analysis was carried out in six phases. For the first phase, data familiarization, participants' responses were read in their entirety, and notes were taken to highlight extracts and ideas of interest. Specifically, our research question - what mental health benefits (if any) do people believe may result from comprehensive sex education and/or STI prevention interventions? - was used to guide this phase, and subsequent coding phases, of the analysis. The second phase involved detecting initial semantic codes – identifying and summarizing explicitly shared ideas, experiences, concepts, etc., related to the research question. The third phase involved identifying initial themes – the

second level of abstraction, where conceptually similar codes across the entire dataset were clustered and collapsed into themes and subthemes. The first author completed these first three phases. Then, the first and second authors completed the fourth phase, reviewing and revising the themes. The authors reviewed the potential themes and overall thematic structure to determine if the themes accurately captured the data; which included determining if extracts appropriately support each theme (e.g., is this idea repeated sufficiently across participants in our data set?), if each theme was homogeneous and coherent (e.g., should the theme be broken into multiple themes or subthemes?), etc. The first author then completed the fifth phase, naming and defining each theme. This involved reviewing the extracts supporting each theme and selecting a name and definition that best captured the meaning those extracts share. The second author reviewed these themes and subthemes to ensure they accurately captured the data. Finally, the first and second authors completed the sixth phase, generating the report.

3.3. Findings and Discussion

Overall, two superordinate and six subordinate themes were identified in the data set (see Table 2). These themes highlight the personal and relational benefits associated with comprehensive sex education. Most of our participants (N = 241) believed comprehensive sex education and/or STI prevention interventions would improve mental health and well-being (see Figure 2). They explained education would lower sexual stigma and shame, facilitate confident and empowered choice, reduce negative emotions (e.g., anxiety and worry), increase acceptance of diverse sexual behaviors, experiences, and identities, and create a general sense of sexual health awareness.

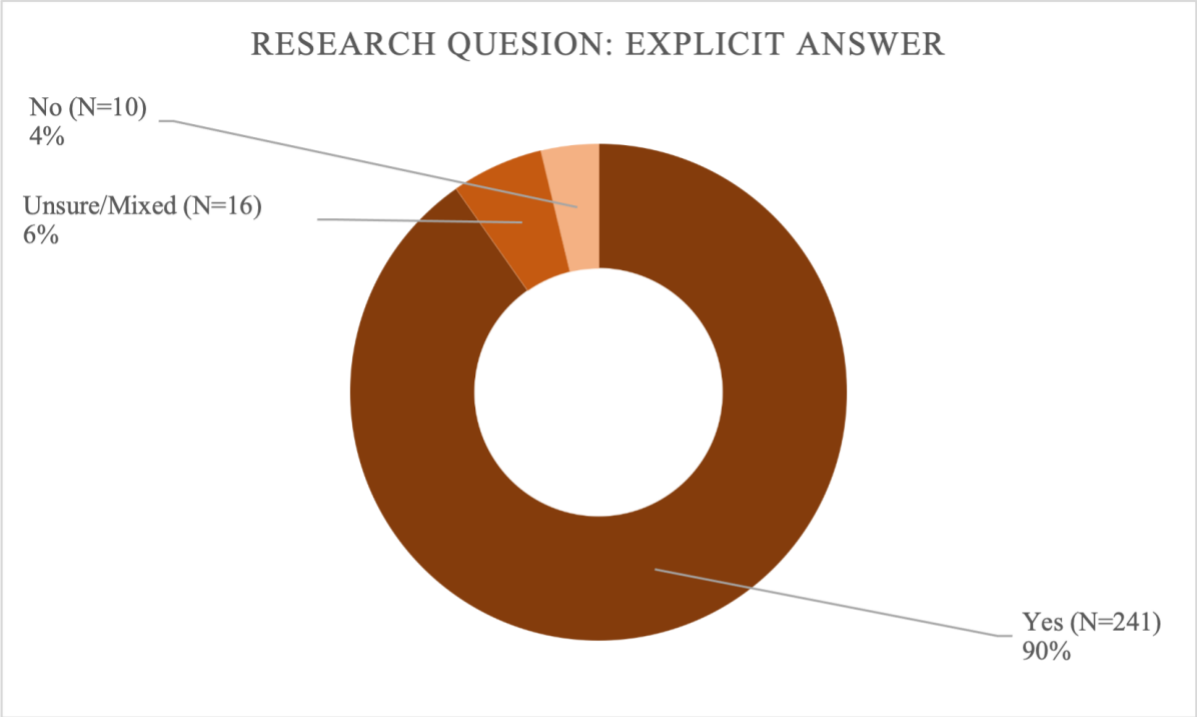


Figure 2. Participants' explicit answer to research question.

Note. With respect to the research question, "Do you believe that medically accurate sex education and STD prevention interventions could improve a person's mental health and well-being?", researchers coded each qualitative response to represent an explicit answer (Yes, No, or Unsure/Mix). This chart represents each coded answer.

Table 1. Comprehensive overview of each theme with example extracts.

Superordinate Theme	Theme	Subtheme	*Supporting Extract*
Knowledge	Safety		*"Openness breeds openness and safety for all" [P#201, non-binary, bisexual]*
	Awareness		*"I believe there is a need for proper awareness and education to guide the young adults when they come of age" [P#99, female, heterosexual]*
	Confidence		*"It helps you gain more confidence during sex and to maintain healthy relationship with your partner" [P#70, male, sexuality not specified]*

	Improved & Informed Decision-Making		*"The more you know the better informed decisions you can make about your own sex life" [P#2, female, heterosexual]*
Psychological Functioning & Well-being	Normalise & Destigmatise	Reduce Stigma & Shame	*"It reduces the guilt and stigma regarding sex in general, as well as boosting ideas of autonomy and self-image" [P#95, non-binary, pansexual]*
		Open Discussions	*"Bringing the topic into more mainstream conversations, so people will think it's less "taboo" to talk about their sexual health and going to help when needed" [P#265, female, bisexual]*
	Lower Negative Emotional Responses	Reduce Stress, Anxiety, Fear & Worry	*"I'd imagine that people are likely to experience less anxiety and worry around sex if they are properly educated" [P#31, female, heterosexual]*
		Healthy Body = Healthy Mind	*"I believe that a healthy body leads to a healthy mind" [P#71, female, heterosexual]*

3.3.1 Psychological Functioning and Well-being

This superordinate theme (N = 175) captures participants' belief that comprehensive sex education promotes better psychological functioning and well-being by mitigating stigma and shame and cultivating open discussions (captured in the theme *normalize and destigmatize;* N = 51). Further, participants indicated that comprehensive sex education could facilitate greater well-being by reducing guilt, anxiety and fear associated with sexual

experiences and by supporting greater physical health, which begets psychological health (captured in the theme *lower negative emotional responses*; N = 125). People suffer when they misunderstand sex, do not have the knowledge to contextualize their experience, and have no space to discuss sex and sexuality openly. This combination of secrecy and a lack of knowledge can lead to fear and shame. Our participants' reflections suggest by promoting understanding and open discussions of sex, comprehensive sex education can improve well-being.

Normalize and Destigmatize. In the theme *normalize and destigmatize,* comprised of two subthemes (*reduce stigma and shame* and *open discussions*), many (N = 51) of the participants endorsed the belief that access to accurate and comprehensive information about sexual health would normalize and destigmatize sexual experiences, outcomes, and identities.

In the subtheme *reduce stigma and shame*, participants (N = 28) highlighted how the taboo nature of sex can contribute to many adverse psychological outcomes, including fear, guilt, and shame ("There is often shame and misinformation around sex." [P#65, male, gay]). Research consistently finds that shame can be a self-perpetuating psychosocial experience, such that shame is intensified by the cultural expectation that people hide their shame (Johnson, 2015). As such, while sexual education programs can serve as a platform to reinforce sexual shame narratives (including those that are heteronormative or cisnormative), they can also serve as a platform to disrupt shame narratives, as Young and colleagues (2019) put it, by "creating the appropriate space in which shame can be acknowledged without silently being reinforced" (pg. 499). Our participants shared this belief that psychological outcomes associated with being a target of stigma (fear, shame, guilt, etc.) could be attenuated by comprehensive sex education:

> "... it could remove fear and stigma around safe casual sex." P#35 (female, heterosexual)
> "It [sex education] reduces the guilt and stigma regarding sex in general…" P#95, (non-binary, pansexual)
> "... it may reduce anxiety and shame around sex…" P#204 (female, bisexual)
> "... it might reduce stigma for some people." P#48 (female, heterosexual)

While several of our participants felt shame about sex was common, within the *reduce stigma and shame* subtheme, some (N = 16) more specifically emphasized the shame and stigma associated with sexually transmitted infections or diseases (STI/STDs) ("... strong stigma

around STDs…" [P#102, male, heterosexual]). Our data suggest that people are aware of the extent to which STIs are stigmatized. This stigma is understood to create psychological problems ("... becoming infected with HPV or any STI can be detrimental to mental health due to stigma." [P#50, female, bisexual]; "... things like HIV can affect someone's mental health and wellbeing due to the stigma around it…" [P#138, female, heterosexual]; "Contracting an STD can be extremely distressing, mostly due to the stigma." [P#29, female, bisexual]), not to mention stigma might be associated with more overt forms of discrimination and abuse ("Some people may receive bullying if they were to contract an STD…" [P#251, male, heterosexual]). Our participants not only felt that comprehensive sex education could promote psychological well-being by reducing STI-related anxiety, but they also shared that education could promote well-being through destigmatizing STIs/STDs. As P#204 describes, "It [comprehensive sex education] may also reduce stigma around the conditions, which may help those who have them" (female, bisexual). Research suggests that education and knowledge do play a key role in shaping STI stigma and shame, such that people who know someone with an STI diagnosis report less STI-related stigma and people who were less satisfied with their sex education experiences report more STI-related shame (Foster & Byers, 2008).

It was common for participants who highlighted the taboo and stigmatized nature of sex to share how discussing sex openly was not permitted in their cultural contexts. These responses are included in the subtheme *open discussions* (N = 23), which underlines the importance of increasing the accessibility and availability of comprehensive sex education and STI/STD prevention interventions, as they can provide a platform and space to discuss taboo topics that would otherwise be ignored and avoided:

> "... knowing the facts leads to less worrying and fewer taboos." P#201 (non-binary, bisexual)
>
> "Discussing it causes it to become 'real' such that society acknowledges its existence and it is no longer 'taboo'" P#15 (male, heterosexual)
>
> "... bring the topic into more mainstream conversations, so people will think it's less taboo to talk about their sexual health" P#265 (female, bisexual)

In the participant's responses, it is evident many felt comprehensive and accurate sex education can promote psychological well-being through open dialogue and communication.

Taken together, our participants believed sex and sexual topics were taboo and

stigmatized in their cultural contexts. Beyond this, they felt sexual shame and stigma were harmful, as they make targets of that stigma feel anxious, ashamed, and isolated ("... [STDs can] make them feel so alone in the struggle" [P#239, female, bisexual]). As such, our participants felt that sexual education could promote well-being to the extent to which it helps people realize they are not alone ("... less people will feel alone…" [P#142, female, pansexual]), and that their sexual experiences are not abnormal, unusual, or immoral. According to our sample, comprehensive sex education can promote well-being by normalizing sexual diversity and reducing sexual shame and stigma.

Lower Negative Emotional Responses. Within the theme of *lower negative emotional responses* (comprised of two subthemes, *reduce stress, anxiety, fear, and worry* and *healthy body = healthy mind*), numerous participants (N=124) suggested accurate and comprehensive sex education could reduce negative emotions associated with sex (e.g., fear, anxiety, and worry). Further, participants shared their belief that there is a strong connection between access to sex education and exhibiting agency and protection over their sexual health and well-being.

Our participants explain how comprehensive education can contribute towards mitigating negative emotional experiences. Specifically, participants highlighted general anxiety and worry about sex as a key factor that could be impacted through engagement with comprehensive sex education. Indeed, some research suggests that sex education can reduce sex-related anxiety (Hertlein et al., 2015; Wanlass et al., 1983). This is captured within the subtheme of *reduce stress, anxiety, and worry* (N = 61):

> "I'd imagine that people are likely to experience less anxiety and worry around sex if they were properly educated" P#31 (female, heterosexual)
> "Generally, correct information helps reduce anxiety…" P#88 (male, gay)
> "It would be positive to get that information, it would increase peace of mind, reduce anxiety" P#33 (male, bisexual)

Similarly, negative emotions associated with sex are also present when desires and behaviors begin to fall beyond the scope of traditional cultural or societal norms. This understanding can be linked to the concept of sexual scripts, which may impact emotions associated with intimacy (i.e., anxiety, fear, worry; Gagnon & Simon, 2005; Quinn-Nilas & Kennett, 2018). Sexual Script Theory (SST) was first coined by Simon and Ganon (1969); it can be defined as a set of guidelines (or "script") that is learned from our social learning environment (i.e.,

movies, family, religious views, school, etc); ultimately impacting our attitudes and behaviors (Quinn-Nilas & Kennett, 2018). Concepts associated with sexual scripts were prevalent within our data set. Participants highlighted the concept of purity culture (see Natarajan, Wilkins-Yel, Sista, Anantharaman, & Seils, 2022) as well as socio-cultural scripts that suppress and control women's sexuality ("Purity culture has never benefited anyone, especially woman as it's meant to control them" [P#112, female, bisexual]). Participant #108 explains how access to comprehensive sex education assists with breaking down scripts associated with purity culture by allowing people to feel more comfortable in their bodies, "I'm a firm believer that sex should be a positive experience. Fear and shame that are used in purity/abstinence culture only obscure and inhibit people from feeling comfortable in their bodies when with others" [male, gay]. Indeed, participants explained how access to sex education reassured them that they might experience diverse sexual desires, which are not to be considered unnatural or worrisome ("...understanding sex is natural would help with others not feeling guilty for engaging in sexual activities…" [P#34, female, heterosexual]; "[sex education] prevents any unnecessary worry" [P#81, female, heterosexual]). Similarly, our data indicates how sexual scripts are reflected in the traditional teachings of contraceptives. Specifically, scripts that link sex/gender with contraceptive responsibilities ("we were taught at school that it is the females responsibility for birth control/protection but actually the male is just as responsible" [P# 21, female, heterosexual]; "Many men are not educated on female contraception which can cause alot of stress and anxiety about sex for females" [P#163, female, heterosexual]. These statements suggest education could expand the narrative on what behaviors and attitudes exist (or should exist) outside the traditional and/or normative viewpoint, and such expansion could reduce negative emotions around sex and sexual expression.

It was common for participants who highlighted stress, worry, and fear of STI/STD transmission to emphasize the connection between physical and mental health; these excerpts are included in the theme *healthy body = healthy mind* (N = 63). This theme outlines the belief that comprehensive sex education provides an individual with resources to keep their body healthy, which, in turn, leads to a healthy mind. Participants suggest having an understanding of how various infections are transmitted assists with keeping their body protected while reducing anxiety, stress and worry ("...being aware of possible and impossible ways of catching STDs would reduce anxiety and stress" [P#7, male, heterosexual]; "[sex education] could definitely reduce short term anxiety of being pregnant or getting the clap" [P#62, male, heterosexual]). The relationship between physical health and

mental health was often cited, even when STI/STD concerns weren't referenced:

> "Just having a better idea of how your body works would improve people's physical and mental experiences of sex" P#29 (female, bisexual)
> "...being unaware of how to protect yourself will likely increase sexual anxiety" P#52 (female, lesbian)
> "Being healthy in all aspects could improve mental health" P#36 (female, heterosexual)
> "They're more likely to be mentally well if their physical health is not impacted" P#43 (female, heterosexual)

Overwhelmingly, our participants placed greater emphasis on the emotional component, rather than the physical component, of STI/STD transmission ("bad experiences with STDs can impact mental health and cause trust issues" [P#188, female, heterosexual]; "STDs can cause a lot of problems and heartache" [P#43, female, heterosexual]). These excerpts reflect participants' belief that by receiving comprehensive sex education, one can better protect and maintain control or agency over their physical health, leading to less anxiety and worry. These findings are supported in similar work where researchers found an HIV-positive diagnosis could lead to HIV-related post-traumatic stress disorder (PTSD) due to impacting factors such as anxiety, stigma, and self-esteem after the diagnosis (Theuninck et al., 2010).

With everything considered, our participants believe implementing accurate and comprehensive sex education can impact well-being by lowering the prevalence of negative emotions (e.g., sexual guilt, anxiety, and worry). They noted that bringing attention to topics set within traditional sexual scripts would expand and challenge these norms, particularly those related to purity culture, sexual desires, and contraceptive responsibility. Furthermore, having access to comprehensive sex education mitigates fear-based responses associated with unfavorable sex outcomes, be that STD/STIs, unplanned pregnancies, or generalized sex anxiety and guilt. Taken together, our participants suggest that comprehensive and accurate sex education may create a healthier experience of sex, both physically and mentally.

3.3.2 Knowledge

This superordinate theme captures participants' belief that having knowledge about sex leads to confidence and an improved understanding of sexual health issues – and,

therefore, can facilitate better, healthier, and safer decisions and behaviors. Lack of comprehensive sex and relationship education leads to ill-informed individuals attempting to navigate various challenges, including those related to STI transmission, understanding sexual consent and sexual pleasure, and building healthy partnerships. The provision of accurate and comprehensive information regarding sex and relationships contributes to an individual's ability to make informed choices, which participants reported as increasing safety, feelings of empowerment, and general well-being. Within this theme, we observe the majority of participants (N = 177) suggest with knowledge comes wiser choices when making decisions, engagement in safer sexual practices, a sense of confidence and power over one's personal sex life, and the belief that general awareness on the topic is beneficial in its own right. Thus, within the superordinate theme of knowledge, four themes were detected: *improved and informed decision-making* (N = 28); *safety* (N = 56); *confidence* (N = 36); *awareness* (N = 57).

Improved and Informed Decision-Making. Within the theme of *improved and informed decision-making* (N = 28), participants suggested knowledge would facilitate improved decision-making skills ("The more you know the better-informed decisions you can make about your own sex life" [P#2, female, heterosexual]; "Individuals can make informed decisions which can help people make the right decisions for themselves" [P#261, female, pansexual]; "The more someone knows the more they can make an informed decision over what to do" [P#219, male, heterosexual]). Furthermore, participants linked knowledge and informed decision-making with well-being ("I think it's important for everyone to have adequate knowledge for their own and their partners' well-being" [P#18, female, heterosexual]; "Knowledge reduces uncertainty and uncertainty can cause anxiety and worries that would not exist if the person knew better" [P#200, female, bisexual]; "Being fully educated about something enables informed decision-making, this helps with well-being" [P#213, male, heterosexual]). Indeed, previous researchers explain individuals who hold strong sexual decision-making skills can meet family planning goals more successfully and report greater levels of pleasure when sexually active (Fuller et al., 2022; Oswalt, 2010). Our participants clearly feel that informed decisions are good decisions, and the extent to which accurate sex education facilitates informed decision-making contributes significantly to its value.

Participants (N = 15) continued to explain information gained from sex education can assist with proactive decision-making rather than retrospective management ("With education, people can make well-informed decisions before engaging in sex" [P#188, female,

heterosexual]; “People would be more educated on this topic which could lead them to critically think before getting themselves into something they wish they didn’t if they had the knowledge on it” [P#252, female, heterosexual]). Again, participants linked proactive decision-making to mental health and well-being (“People would be well informed to prepare and make decisions when the time comes, [comprehensive sex education] would make them less stressed and anxious.” [P#173, female, heterosexual]). Participants reflected that a key advantage of informed decisions was their ability to support planning and preparation - this may be particularly critical given that of the negative or distressing outcomes associated with sex, sexual regret is more common than other, more thoroughly investigated, physical outcomes (e.g., STI/STD transmission, unplanned pregnancy; Oswalt et al., 2005).

Taken together, participants share how knowledge gained by comprehensive sex education allows an individual to choose if/when/how they would like to engage in sex, reduce sexual anxiety and worry, and experience increased overall well-being through *improved and informed decision-making*. As previous literature and our data suggest, when individuals are not provided with adequate knowledge of sex education or skills to engage in informed sexual decision-making, it can potentially set them up to fail when navigating such challenges (“Knowledge is empowering and the more people know about their own bodies and protective practices the more likely they are to be able to make informed choices.” [P#51, female, bisexual]). Participants' responses within this theme reflect the belief that receiving informed sexual decision-making skills from comprehensive sex education builds a foundation for experiencing a healthy and happy sex life.

Safety. Closely linked to the notion of informed decision-making, *safety* (N = 56) is another theme connecting knowledge gained from comprehensive sex education to psychological well-being. As explained by P#25, “Sex education is vital to mental health and well-being because understanding the nuances of sex and safe sex is important to having a safe and fulfilling sex life” (female, heterosexual). Safe sex should not just be defined as protection from STI transmission and unplanned pregnancies; it also encompasses emotional attributes allowing an individual to engage in the activity confidently and consensually. As such, P#95 shares, “...[sex ed] is one of the best ways to destigmatize rape victims and give them the language to protect themselves or expose their attackers” (non-binary, pansexual). By understanding what safe consensual sex ‘looks’ like, one can detect unsafe sexual advances better. This idea that safe sex is not simply disease-free sex, but is also emotionally safe, is supported by research from Cook and Wynn (2021). Their participants explained that safe sex is consensual, involves both emotional and physical safety, and prioritizes agency

(e.g., having sex because you want to, not to please another).

Together these findings highlight why safe sex goes beyond avoiding STI transmission and unplanned pregnancies. The subtheme of *safety* provides insight into how knowledge of healthy relationships via comprehensive sex education is perceived to increase one's ability to protect themselves emotionally and physically. One of our participants captures this relationship between knowledge, safety, and well-being particularly well, "If you are happy, your mental health is better. Knowing you're having safe sex makes you happy" [P#16, male, heterosexual].

Confidence. When reflecting on the mental health benefits of accurate sex education, several participants shared that *improved and informed decision-making* and increased ability to engage in *safe* sex resulted in feeling more *confident* (N = 36). Indeed, we see the themes interlinked by P#226, "Information and knowledge is key for people to be confident in knowing how to practice safe sex relations" [female, heterosexual]). Similar to the concept of proactive decision-making versus retrospective management within the *improved and informed decision-making* theme, we see participants reflecting on personal experiences associated with *confidence* and *safety*. Specifically, participants explained their desire to have previously received comprehensive sex education to gain the confidence and decision-making skills to engage in safe sexual practices ("It could give a young person the facts and the confidence not to engage in unsafe sex like I did" [P#214, female, heterosexual]). These findings are echoed in the broader literature on the topic of sex education, where various researchers explain greater levels of sexual health knowledge are associated with variables such as sexual confidence and assertiveness (Weinstein et al., 2008) and self-acceptance (Woodford et al., 2018).

Confidence on its own is cited within the data as facilitating improved mental health and well-being ("It [sex ed] would increase confidence which would then naturally and positively affect one's mental health" [P#195, female, heterosexual]; "...[sex ed will impact mental health] largely by instilling confidence and reducing anxiety" [P#76, female, bisexual]). Participants also explained how education is linked to confidence and independence ("The more educated you are about sex the more confidence and independence it can give you" [P#6, female, heterosexual]. It was clear that participants felt that sex education creates a sense of empowerment over oneself ("The ability to be responsible and care for oneself is emotionally empowering" [P#38, female, heterosexual]).

Building on the idea of emotional empowerment, within the *confidence* theme, we see that some in our sample (N = 3) attributed comprehensive sex education to the ability to

better manage unrealistic expectations that may arise from sex portrayed by the media:

> "I think for some their mental health is often affected by anxieties to do with unrealistic standards propelled in the media. E.g. they believe their boobs or genitalia should look a certain way, or they should be having sex at a certain age due to social media and therefore think something is wrong with them when they don't meet those standards. Therefore, being more [educated] on the matters may ease some anxieties and help their well-being" (P#156, female, heterosexual)

Overall, many of our participants believe that comprehensive sex education improves mental health by instilling *confidence* - and while confidence is desirable in its own right, confidence may facilitate improved well-being through empowerment to make healthy and safe sexual choices.

Awareness. Drawing on our participants' outlook regarding *awareness* (N = 57), many stated they felt their sex education lacked relevance to modern-day social norms concerning gender, non-hetero and/or non-penetrative sex, and consent. Overall, our participants expressed a desire for a deeper awareness from sex education curricula. Participants shared that much of the information within our study was new to them ("...awareness is essential and should be more in-depth as I didn't know about the things in most questions" [P#242, male, heterosexual]; "I haven't been taught about stuff like this so I think it is really important" [P#177, male, gay]; "After completing this survey I realised I do not know as much as I should" [P#166, female, heterosexual]). Furthermore, participants explained how this experience of inadequate sex education perpetuated their worries from adolescence into young adulthood rather than providing them with a foundation to make safe and informed decisions ("[from lack of proper sex ed] I have seen people well in their 20s worrying and being anxious about the stuff they shouldn't be worrying [about]" [P#39, female, heterosexual]; "I had a required class in high school that taught sex education. It didn't do anything for me…and thank god I haven't run into any personal issues" [P#63, female, heterosexual]).

Overall, as participants share the limitations of their own education and the limits of their own understanding, they reflect that they want more from their sexual education experiences. Our participants want a sexual education curriculum that reflects modern-day sexual diversity, experiences, and challenges ("promote consent, individual rights, wishes [desires] and protection, overall set a stage for quality sexual behavior and security in sexual

identity…" [P#101, female, heterosexual]). Concerning our participants' claims, Hole and colleagues (2022) report traditional sexual education was often described as "mechanistic", where their participants were hoping to have topics relating to pleasure, sexual diversity, and self-efficacy. Yet, instead, they received basic biology lessons on genitalia, why people with a womb have periods, and the risks associated with sex.

Together, our analysis revealed themes that connect increased knowledge to improved and informed decision-making skills, safer sex (both emotionally and physically), and increased confidence. The superordinate theme of knowledge illustrates participants' belief that comprehensive sex education links to mental health and well-being by providing people with adequate knowledge to form a foundation for a healthier and happier future.

3.3.3 Exploratory Analyses

To explore whether participants' age (young adults (18-34) vs. middle-aged (35-54) vs. older adults (55-74) or previous sex education experiences (abstinence-focused vs. comprehensive vs. no sex education) influenced responses and the emergence of specific themes, contingency tables were produced via a series of chi-square analyses (see Table 3). The results indicate that most themes were not influenced by an individual's age or previous education experience. However, a chi-square test of independence revealed a significant association between sex education received and the subtheme reducing stigma and shame, $\chi^2(2) = 8.78$, $p = .012$, Cramer's $V = .182$. We find that participants who received abstinence-focused sex education were more likely to share responses coded as reducing stigma and shame compared to those who received comprehensive or no sex education. This means that individuals who received abstinence-focused sex education in school were more likely to state that access to comprehensive sex education would further reduce sexual health-related stigma and shame. The potential for accurate and comprehensive sex education to reduce stigma and shame may be particularly salient for participants exposed to abstinence-focused sex education, given that students in abstinence-only programs (particularly those with marginalized identities) describe the curricula as fear and shame inducing (Hoefer & Hoefer, 2017).

Table 2
A chi-square test of independence for the relationship between age, sex education experience, and themes emerged.

Grouping Variable	Theme			
	Psychological Functioning and Well-Being			
	Reduce Stigma & Shame	Open Discussions	Reduce Stress, Anxiety, & Fear	Healthy Body = Healthy Mind
Age				
Chi-Square Value	5.68	3.91	1.42	1.38
P-Value	.058	.142	.493	.501
N	267	267	267	267
Sex Education Received				
Chi-Square Value	8.78*	1.91	1.53	3.46
P-Value	.012	.386	.465	.177
N	264	264	264	264
	Knowledge			
	Safety	Awareness	Confidence	Improved & Informed Decision-Making
Age				
Chi-Square Value	1.73	2.00	2.70	2.35
P-Value	.421	.367	.259	.309
N	267	267	267	267

Sex Education Received				
Chi-Square Value	1.86	1.60	3.61	1.98
P-Value	.395	.449	.165	.372
N	264	264	264	264

3.3.4 Limitations

Despite our attempts at employing our survey in racially, ethnically, and age-diverse populations through various platforms and survey tools, roughly 50% of our responses were from heterosexual females between 18-34 years old, suggesting our data is skewed towards experiences and viewpoints of younger, heterosexual women. Another limitation of this study is that the research question was framed as linking education to mental health and well-being (i.e., "do you believe that medically accurate sex education and STD prevention interventions could improve a person's mental health and well-being?"). Although the themes were detected from the participant's reflections on the question, the framing of the item could have unintentionally biased their responses. As such, researchers Noble and Smith (2015) outline the importance of eliminating leading questions and word biases within qualitative research. Based on various suggestions from their review, future researchers should investigate the link between comprehensive sex education, mental health, and well-being through items that are phrased a bit more broadly (e.g., "what outcomes do you think are associated with accurate and comprehensive sex education?") or through the use of questions that reflect multiple frames and anchors (e.g., "Do you think accurate and comprehensive sex education affects people's physical health? Why or why not?"; "Do you think accurate and comprehensive sex education affects people's psychological health? Why or why not?").

Lastly, this data holds a sense of hypothetical or imagined nature as we asked people to reflect on what they perceive as the psychological outcomes or benefits associated with accurate and comprehensive sex education. Therefore, we suggest a study design that includes an accurate and comprehensive sexual health and relationship workshop or training and the use of structured or semi-structured interview methods (e.g., including questions with diverse stems and framings, as well as the use of follow-up questions and probing) would be

useful to replicate and confirm the identified themes.

3.3.5 Implications

The findings from this analysis provide direct insight into people's beliefs about the benefits and value of access to sex and relationship education (e.g., contraceptive use, family planning, consent, sexual diversity, psychological safety, etc). These findings can be applied in a variety of settings, such as policy and practice; sexual health advocacy; sex education curriculum development/deployment; school nurses and family practitioners; as well as academic research.

For example, with respect to policymakers and legislators, participant responses outline that future policy development for sex education should promote awareness, body autonomy, and confident decision-making skills. Furthermore, legislators should reflect and listen to participant responses that bring light to the costs associated with an abstinence-focused curriculum. In other words, a curriculum that positions contraceptive measures as a female issue, enforces a cis-gender and heterosexual narrative, and pushes aside experiences of gender-expansive identities and further marginalized groups should no longer be implemented, encouraged, or considered the societal norm. Building on Sleeter and Grant's critique regarding the importance of representation in school textbooks for how youth perceive and comprehend their own experiences (2011), it is essential that curriculum developers prioritize both comprehensiveness and representation in educational materials. To address this concern, curriculum developers could incorporate greater diversity by including textbook images inclusive of non-heterosexual relationships and by depicting the medical terminologies of reproductive organs, vulvas, and penises, which feature individuals from various racial backgrounds. Lastly, for practitioners, having a thorough understanding of how various psychological concerns may manifest during puberty can be useful for school nurses and primary care physicians as they are a critical component and source of information for adolescents and young adults when navigating the challenges related to sexual development.

Across the world, several countries and states uphold mandates where pupils are only allowed to receive abstinence-focused material (Horanieh et al., 2020; Lewinger & Russell, 2021; Planned Parenthood Action Fund, 2022; The SIECUS State Profiles, 2023; Thin Zaw et al., 2021). As such, we understand the legislative policies surrounding the teachings of comprehensive sex education are an uphill battle with nuanced language and restrictive

mandates. However, we argue that by bringing awareness and acknowledgment of the substantial mental health benefits, we can slowly create change on the individual level while we work towards challenging unjust systemic issues.

3.3.6 Conclusions

When asked to reflect on the potential mental health and well-being outcomes associated with accurate and comprehensive sex education, participants overwhelmingly shared that being better informed about sexual health could lead to a number of positive personal and relational consequences. Participants wanted more from their sexual education experiences and felt that improved sexual education curricula would improve their own - and others' - psychological health and wellness. Although literature commonly emphasizes the physical health benefits associated with accurate and comprehensive sex education (Goldfarb & Lieberman, 2021), our findings suggest that a host of psychological outcomes should be explored in the sexual health and sexual education literature. Overall, our participants believed having a healthy and happy intimate life would lead to a healthier and happier state of mind.

Chapter 4: Political trends across the landscape: Mapping mindset and sexual health-related concerns across the 50 States of America

As discussed in the earlier chapters, we explored how individual mindsets vary and correlate with attitudes and intentions related to topics such as infidelity, and we reviewed how access to sex education is linked to a host of psychological benefits. Prior to delving into Chapter 5, which presents an empirical study investigating the link between mindset and sexual health, it may be beneficial to analyze existing data in the United States of America (USA) to visualize patterns and trends between the tightness-looseness framework and concepts related to sexual health. Thus, this chapter seeks to demonstrate how mindset scores differ at the state level and how this may relate to fluctuating policies and government mandates. Indeed, we will keep with the specific focus on the primary subject of this thesis: Sex Education.

However, given that this thesis was conducted during a period coinciding with the reconsideration of Roe v. Wade - a landmark 1973 legal case that affirmed a woman's constitutional right to choose to have an abortion within the USA - this chapter will also delve into the landscape of abortion legality across the USA and its intersection with state mindset scores. Together, this section will visualize the variance of mindset at the regional level and explore its connection to Sex Education Mandates and Abortion Legality after the fall of Roe v. Wade.

4.1 Introduction

In examining the implementation (or lack thereof) of sex education and access to abortion, it is crucial to contextualize these concepts within the realm of social policy. Social policy encompasses a range of governmental actions, programs, and regulations to address social challenges and enhance the overall well-being of people and communities (Yerkes, 2019). Indeed, sex education and access to abortion affect an individual's health and well-being. For example, as Chapter 2 outlines, lack of information hinders an individual's ability to engage in sex without overwhelming feelings of anxiety and guilt, as well as being able to detect signs of abuse. Notably, such topics are often politically polarized and spark public debates surrounding their implementation. Eventually, these debates lead to legal frameworks and policy development, which are often influenced by cultural (Leung et al., 2019), moral (Cacique et al., 2019), religious (Vaggione & Machado, 2020), and political (Blystad et al., 2020) considerations.

Currently, in the USA, the provision of sex education and access to sexual healthcare is regulated state-by-state. For sex education, this grants individual states, districts, and school boards the independence to decide how federal policies and funding for sex education are put into action (Leung et al., 2019). With respect to abortion access, the Supreme Court's landmark decision to overturn Roe v. Wade resulted in individual states gaining the authority to enact their own laws regarding access to abortion services (Compton & Greer, 2022). Although each state has the power to implement these regulations independently from one another, there are patterns and trends across the political landscape.

Such trends within the 50 states are commonly evaluated against social science frameworks and principles. Emerging from cross-cultural psychology, the concept of cultural mindset - whether a society or group upholds 'tighter' or 'looser' norms and regulations - has been used to explain regional diversity within the USA (Harrington & Gelfand, 2014). As a reminder, tightness-looseness refers to the clarity or perceived strength of social norms and the extent to which one can deviate from the norms of the strength of sanctioning (Gelfand et al., 2006).

The tightness-looseness continuum has proven instrumental in explaining diverse behavioral and attitudinal patterns across various regions of the United States. Some applications include its exploration of social behaviors during the peak of COVID-19 (Gilliam et al., 2022), analysis within political systems (Othman et al., 2023), and investigations into leadership dynamics (Aktas et al., 2015). These examples underscore the continuum's broad utility in comprehending human behaviors and attitudes. However, within the realm of cultural mindset, there exists a notable gap in the literature - a gap that neglects the socio-political dimensions of American policies crucially impacting individual well-being. Specifically, the areas of Sex Education and Abortion Access remain underrepresented in the existing literature. As such, we visualize two relationships: i) regional patterns between tightness-looseness and sex education mandates within the USA and ii) the relationship between tightness-looseness and access to sexual healthcare in the USA after the fall of Roe v. Wade.

To visualize the relationship between tightness-looseness, sex education mandates, and sexual healthcare, freely available data was curated together to produce a USA regional map in ggplot2 (Wickham, 2023) using R-studio (2023.06.0+421; R Core Team, 2023). Firstly, Harrington and Gelfand (2014) report mindset scores for all 50 states; this was used to create the tightness-looseness score across each state. State scores ranged from looser (27.37) to tighter (78.86) and were estimated by standardizing composite scores of nine

items: four of which captured the strength of punishment, two captured permissiveness, another two captured order and constrained behavior, and the final item captured international diversity.

Secondly, the Sexuality Information and Education Council of the United States (SIECUS) - a non-profit organization dedicated to advancing sex education by policy and advocacy - website outlines updated policies and regulations of sex education mandates across all 50 states. Specifically, SIECUS states whether or not each state upholds a sex education mandate and then states if it is comprehensive, abstinence-plus, or abstinence-only. By matching each state and its specific mandate, we created the categorical sex education variable (see The SIECUS State Profiles). Notably, for clarity, the data will be visualized as mandated versus not mandated and then broken down by comprehensive or abstinence within the text. Lastly, open data from the Guttmacher Institute - a prominent research and policy organization dedicated to promoting global sexual and reproductive health and rights - produced the abortion legality column, categories represent state protections being in place, greatly restricted, and ban blocked (See Roe v Wade: Which US states are banning abortion?).

4.2 Tightness-Looseness X Sex Education

Here, we display tightness-looseness ('Score') by color scheme and sex education mandates by pattern (Figure 1a). The darker the state, the tighter their mindset score. Likewise, the lighter-colored states indicate looser mindset scores. For sex education, different patterns indicate if a specified state has a mandate in place when teaching sex education and relationship training. Circles denote that at the state level, there is a requirement for the implementation of some form of sex education curriculum (e.g., Comprehensive, Abstinence-Plus, or Abstinence-Only). To preface, comprehensive sex education typically includes topics related to healthy relationships and gender-expansive identities, is culturally competent, and should be free of shame and fear (Agtarap & Adair, 2023). Though Abstinence-Plus programs will also add comprehensive topics, they must stress the importance of abstinence as the primary method to avoiding unintended pregnancies and STIs (Hess, 2011). Lastly, Abstinence-Only programs will very rarely add extended topics of healthy relationships and consent, nor will they include broader contraceptive methods, stressing the importance of abstinence as key in an attempt to mitigate pre-marital sex (Hess, 2011).

A wave indicates that no state-level mandates require school districts to implement sex education curricula. When examining the relationship between the two variables, there is a trend such that looser states are likely to have sex education mandates in place (e.g., of the ten loosest states, eight currently hold comprehensive or abstinence-plus mandates). However, the relationship between tightness-looseness and sex education mandates becomes more difficult to discern in 'tighter' states (e.g., of the top ten tighter states, five hold abstinence-only policies, and the other five have no policies in place). As we see here, how these mandates are implemented greatly varies in ensuring comprehensive and inclusive information is taught (looser states: California, Oregon, Washington) or mandating that information is kept to a minimum (tighter states: Mississippi, Alabama, Arkansas; see Figure 1b for a thorough breakdown of each state and their respective category).

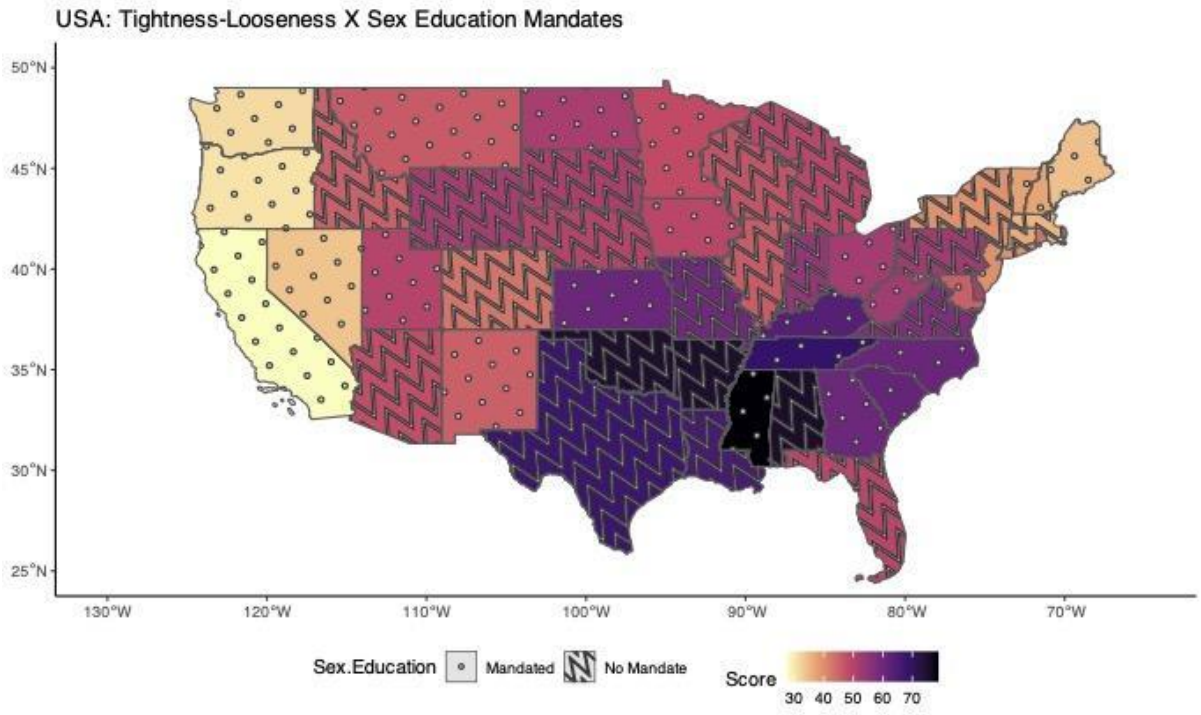


Figure 1a. Tightness-Looseness X Sex Education Mandates

Note. Figure displaying Tightness-Looseness Score by Sex Education Mandate. The tighter the state, the darker the color whereas the looser the state, the lighter the color. Each state is characterized by a specific pattern. A circle represents a mandate is in place whereas a wave indicates no sex education mandate.

As explained above, state-by-state policies are more nuanced than being mandated or not. To better understand the relationship between tightness-looseness and sex education

provisioning, we'll examine the three loosest and tightest states. Standardized mindset scores for people living in California represent the loosest mindset score (27.37) and the most progressive sex education policy. California's state policy requires the curriculum to be comprehensive, culturally competent, and medically accurate (SIECUS, 2023). They also require the inclusion of material on healthy relationships, which must include examples of same-sex relationships (California Department of Education, 2023). The remaining two loosest states, Oregon (30.07) and Washington (31.06), push sex education frameworks that are captured as Abstinence-plus. Abstinence-plus curriculum is a category of sex education that commonly includes broader information on birth control, consent, STIs, and sexuality to be taught; however, the curriculum must stress (or at least include) abstinence (Wiley, 2002). Indeed, the state policies for Oregon and Washington require that the curriculum be comprehensive and promote abstinence - though abstinence must not be the only contraceptive method taught (SIECUS, 2023). The curriculum must not include shame or fear-based learning tactics and must be inclusive of sexual and gender-diverse identities and expressions, and they must also have instruction on consent and ensure that the information provided is medically accurate (Oregon Department of Education, 2023; SIECUS, 2023).

As we work our way to the tighter end of the continuum, we see the tightest three states, Mississippi (78.86), Alabama (75.45), and Arkansas (75.03), vary in their mandates. For Alabama and Arkansas, there are no mandates in place for sex education. However, if a school district does develop a curriculum concerning sex and relationship training, it must be an abstinence-only framework (SIECUS, 2023). Abstinence-only curricula must stress abstinence and typically provide no standards for medically accurate information, instruction on consent, sexual orientation, or gender diversity (Wiley, 2002). If abstinence-only education is offered, neither Alabama nor Arkansas have requirements mandating the information to be medically accurate or inclusive of non-heterosexual identities (SIECUS, 2023). Notably, both states require some form of HIV/STI education (SIECUS, 2023); however, it is clear that this on its own does not successfully reduce STI rates. As the Centers for Disease Control and Prevention (2021) cites, both states are ranked close to the nation's highest in STI transmission rates.

Mississippi, the tightest state (78.86), does have a mandate in place. Here there is an observable shift in the language of social policy, transitioning from a positively oriented, informative, and inclusive framework to one characterized by constraints and adherence to a heterosexual marital paradigm. Mississippi's state policy requires abstinence-only instruction where educators are not allowed to explain how to use any contraceptive, including

demonstrations for condoms (Teen Health Mississippi, 2023). There is no legal requirement for instruction on consent or for information delivered to be medically accurate (SIECUS, 2023).

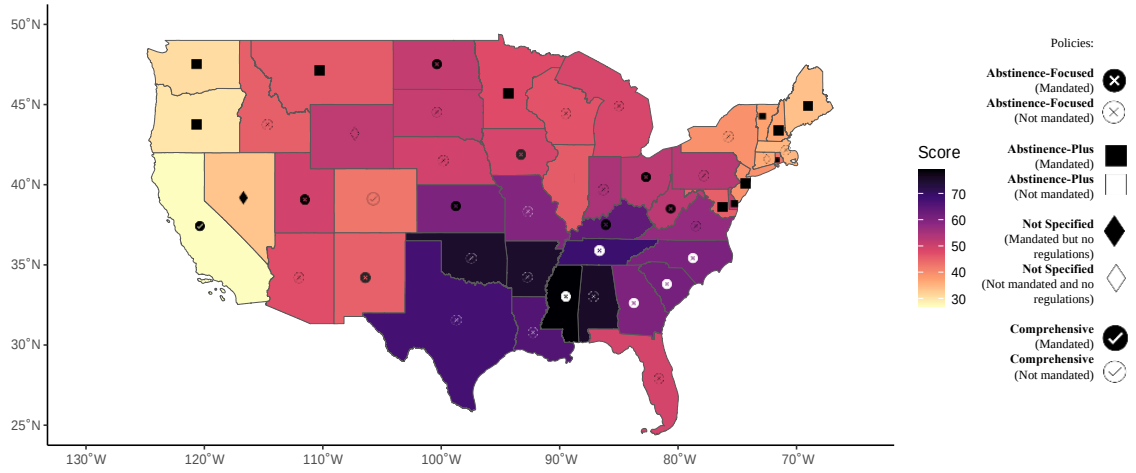


Figure 1b. Tightness-Looseness X Sex Education Mandates

Note. Figure displaying an overview of each state and a) the specific mandated sex education policy and b) what policy must be carried out if the non-mandated state delivers a sex education course (e.g., Alabama and Arkansas hold no sex education mandate but if sex education is taught, an abstinence-focused policy must be employed).

Furthermore, legal guardians must receive a one-week warning before the provision of any sex education instruction, where schools, in return, must obtain written consent back from the guardian before the student can participate - ultimately, the student must "opt-in" to the course (SIECUS, 2023; Teen Health Mississippi, 2023). Lastly, and most concerningly, within the Mississippi mandate, educators must inform pupils of their state law on non-heterosexual activity, which criminalizes consensual anal and oral sex. It is important to note that in 2003, the US Supreme Court rendered a verdict in Lawrence v. Texas, deeming that state laws criminalizing homosexual behavior are unconstitutional. Mississippi has yet to repeal this state conduct code (Mississippi Code: 97-29-59 (2020)). Beyond the mandate itself, Mississippi's approach stands out for its arguably discriminatory and exclusionary stance in implementing social policies for sex and relationship education.

4.3 Exploratory Analysis

4.3.1 Tightness-Looseness X Sex Education

To explore whether state mindset scores (tighter-looser) and sex education policies (comprehensive vs. abstinence-plus vs. abstinence-focused vs. not specified vs. no mandate) were significantly related to one another, an analysis of variance (ANOVA) was conducted. The model revealed a statistically significant difference between the groups, such that people living in states with different sex education policies produced different mindset scores ($F_{4, 45} = 7.11$, $p < 0.001$, $\eta^2 = 0.387$). Specifically, states with abstinence-focused policies were more likely to be coded as culturally 'tight' (*M = 58.05; SE = 2.85*) compared to states with comprehensive (*M* = 27.37; *SE* =10.29) and abstinence-plus policies (*M = 39.92; SE = 2.97*; Table 1). In line with the visualization of state policies and mindset scores, looser states tended to implement policies aligned with comprehensive or abstinence-plus programs. These results are similar to Harrington and Gelfand's (2014) finding that tighter states reported stronger conservative political beliefs inclusive of restrictions towards lesbian, gay, bisexual, trans, and queer (LGBTQ) rights as well as the expression of concern towards condoms being distributed within high schools.

An exploratory ANOVA was also conducted for state mindset scores (tighter-looser) and for the type of policy that must be followed when non-mandated states deliver sex education (comprehensive vs. abstinence-plus vs. abstinence-focused vs. not specified vs. mandated). This analysis was not significant, such that people living in states with different non-mandated policies did not produce different mindset scores ($F_{4, 45} = 1.43$, $p = .238$, $\eta^2 = .113$).

Table 1. Post Hoc Comparisons - Tightness-Looseness and Sex Education Mandates

Comparison							
		Mean Difference	SE	df	t	p_{holm}	Cohen's d
Abstinence-Focused	Comprehensive	**30.68**	**10.68**	**45**	**2.87**	**.049**	**2.98**
Abstinence-Focused	Abstinence-Plus	**18.13**	**4.12**	**45**	**4.402**	**<.001**	**1.76**
Abstinence-Focused	Not Specified	24.44	10.68	45	2.29	.161	2.38
Abstinence-Focused	No Mandate	5.34	3.57	45	1.50	.568	.519

Abstinence-Plus	Comprehensive	12.55	10.71	45	1.172	.743	1.22
Abstinence-Plus	Not Specified	6.31	10.71	45	.589	1.00	.613
Abstinence-Plus	No Mandate	**-12.79**	**3.66**	**45**	**-3.49**	**.010**	**-1.24**
Comprehensive	Not Specified	-6.24	14.55	45	-.429	1.00	-.607
Comprehensive	No Mandate	-25.34	10.51	45	-2.41	.140	-2.46

Bold print indicates statistical significance.

4.4 Tightness-Looseness X Abortion Access

Similar to the section above, tightness-looseness ('Score') is displayed by color scheme; the darker the state, the tighter their mindset score. Likewise, the lighter-colored states indicate looser mindset scores. For abortion legality, different patterns indicate the status of abortion legality. A circle shows that state laws are in place that protect or support a pregnant individual's access to abortion care ('Protections in Place'). If the state has banned or greatly restricted access to abortion ('Greatly Restricted'), this is noted by a crosshatch pattern, and if a state judge has blocked an attempt towards further abortion restrictions or bans ('Ban Blocked'), this is visualized using a wave pattern (Figure 2). A state is considered 'Greatly Restricted' if abortion is completely banned with very limited exceptions (e.g., save the life of the pregnant person) or if multiple doctor visits are required (e.g., counseling, ultrasounds, and another for the termination procedure; Guttmacher Institute, 2023).

When examining the relationship between tightness-looseness and abortion regulation, there is a statistically significant trend wherein looser states are more likely to have policies in place protecting the right to abortion, and tighter states are more likely to have restrictions in place (see section 4.4.2, Table 2). The following will expand on state-specific abortion policies for the five loosest and tightest states.

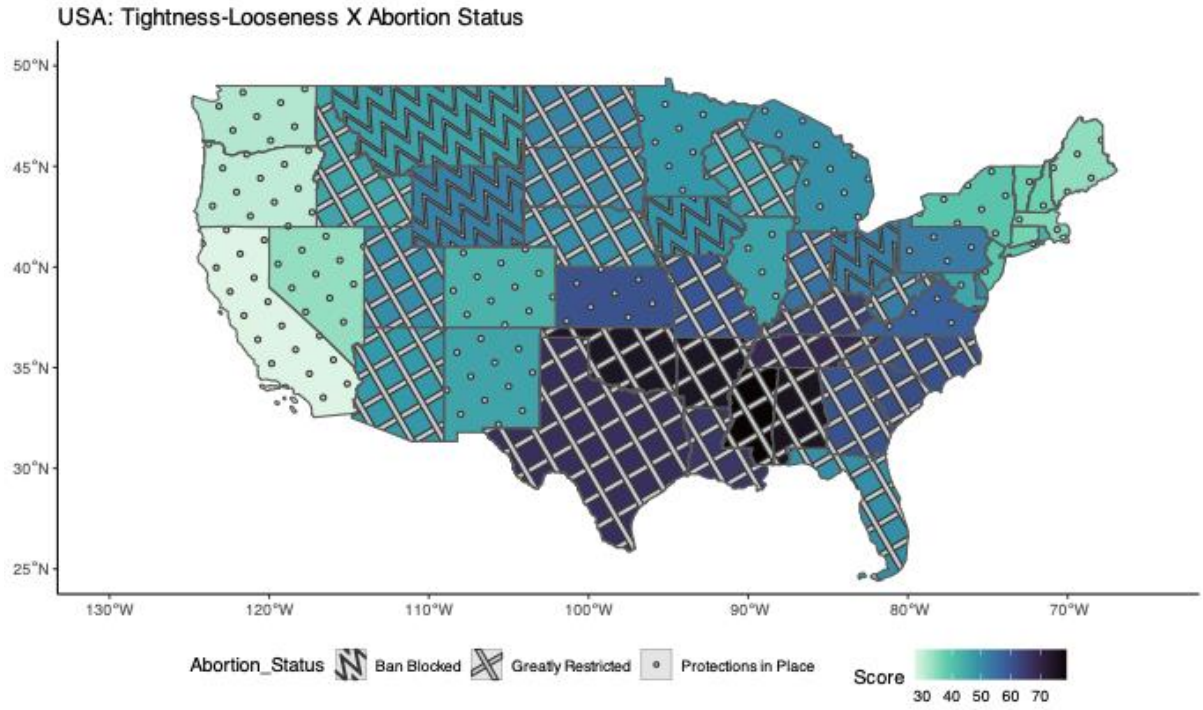


Figure 2. Tightness-Looseness X Abortion Status

Note. Figure displaying Tightness-Looseness Score by Abortion Status. The tighter the state, the darker the color whereas the looser the state, the lighter the color. Each state is characterized by a specific pattern. A circle represents protections in place for abortion access, a crosshatch represents extensive restrictions in place (e.g., only to save the life of the pregnant person), and a wave indicates a state judge has blocked further attempts at restricting access to abortion care.

Beginning with the loosest states, California (27.37), Oregon (30.07), Washington (31.06), Nevada (33.61), and Maine (34), each state has laws that protect access to legal abortion care (Batha, 2023). Oregon, the second loosest state, has the most protective abortion policies of anywhere in the US where termination is not restricted based on gestational age, there are no mandatory waiting periods, and you can access abortion medication by post (until ten weeks gestation; Oregon Department of Justice, 2023). California, Oregon, Washington, and Maine residents who qualify for state Medicaid funds can use these funds to cover abortion costs, and private health insurance plans are required to cover expenses accrued (Guttmacher Institute, 2023). Similarly, in each of these states, qualified healthcare professionals (e.g., advanced practice clinicians), not limited to obstetricians-gynecologists, are authorized to perform abortions (Sagar et al., 2023; Guttmacher Institute, 2023). Indeed, training physicians outside of gynecology improves

access to abortion care by expanding the pool of qualified healthcare professionals who can provide these services. This inclusivity helps mitigate potential shortages in certain regions and ensures a more widespread and equitable availability of abortion services for individuals seeking reproductive healthcare (Sagar et al., 2023).

As mentioned above, Oregon does not restrict abortions based on gestational age; although the remaining four states do enforce gestational limits, they begin at fetal viability, starting around 24 weeks. The five loosest states safeguard against harassment and physical harm for individuals accessing abortion clinics. In these states, specific measures have been implemented to manage protests near clinics. For instance, “buffer” zones completely restrict protestors around the clinic, while “bubble” zones aim to safeguard individuals within a designated distance from the clinic (Guttmacher Institute, 2023). Moreover, these states have established a protective law, commonly called a shield law, which protects or shields providers from investigations initiated by other states. For example, if a healthcare provider legally performs abortions in one state, the shield law prevents them from being subject to investigations or legal actions in another state based on the provision of abortion services in the first state. This legal safeguard helps maintain the autonomy and professional standing of healthcare providers across state borders, particularly within looser states. This law may also extend its coverage to patients and supporting organizations (Guttmacher Institute, 2023).

When we examine the abortion laws of the five tightest states, Mississippi (78.86), Alabama (75.45), Arkansas (75.03), Oklahoma (75.03), and Tennessee (68.81), we see that each state has implemented restrictions on abortion access. In fact, the Guttmacher Institute (2023) categorizes each of these states in the “most restrictive” bracket in terms of policies for abortion. Indeed, within each of these states, abortion is completely banned, apart from very rare exceptions (Guttmacher Institute, 2023). In Mississippi and Oklahoma, abortion is illegal unless performed to save the pregnant person's life or in the case of rape or incest (but only if reported to law enforcement; Center for Reproductive Rights, 2022). In Alabama and Arkansas, an abortion may be allowed if the pregnant person's life is at risk (Batha, 2023). Tennessee holds a near-total abortion ban, prohibiting abortion from fertilization with limited medical emergency exceptions (Center for Reproductive Rights, 2022). Tennessee policy does not have exceptions for rape or incest and requires “affirmative defense” for all abortion procedures, meaning the provider must demonstrate in court that the abortion procedure adhered to the criteria meeting legal medical exceptions (Galofaro, 2022; Guttmacher Institute, 2023). In each of these five states, if an abortion is sought, the law requires a minimum 24-hour waiting period and biased counseling - which provides inaccurate and

incomplete medical information in an attempt to stop the patient from going forward with the termination (Bain, 2022) - and an ultrasound to confirm gestational age and warn against risks associated with receiving termination care (Center for Reproductive Rights, 2022).

A brief review would reveal that the perceived risks associated with abortion are frequently overstated, particularly in the case of medical abortions, which have been shown to be a safe procedure (Schummers et al., 2022). Additionally, the requirements accompanying this form of care, such as mandatory waiting periods and counseling, serve to heighten barriers to the procedure. These barriers encompass factors like travel expenses, time away from work, and childcare responsibilities (Altındağ & Joyce, 2022), not to mention the potential for encountering stigma and harassment when visiting abortion clinics due to the lack of "buffer" or "bubble" zones.

Additionally, the tightest four states have implemented unnecessary regulations to close (or shutter) abortion clinics without any concern for medical standards or protocol (Guttmacher Institute, 2023). Concerning state-by-state funding guidelines to assist with abortion costs, Medicaid coverage has been banned in each state except for limited circumstances (Guttmacher Institute, 2023). For private health insurance, there are no mandating laws requiring insurance plans to cover abortion services in these states. In fact, Oklahoma bans private healthcare from covering costs incurred from an abortion - except in 'very limited circumstances' (Guttmacher Institute, 2023). Lastly, when highlighting the policies implemented throughout the states, we must underline abortion criminalization. Within Mississippi, if a clinician performs an abortion outside of their regulations, they risk a prison sentence of up to 10 years. Likewise, Oklahoma also passed a law criminalizing an abortion procedure with up to 10 years in prison and up to a $100,000 fine; most concerningly, Oklahoma (and Texas) passed bounty laws that incentivize state residents to sue anyone who performs or helps a person in getting an abortion (Batha, 2023).

In conjunction with these more restrictive legislations, researchers highlight the structural inequities that disproportionately subject certain populations to conditions such as poverty, trauma, adverse childhood experiences, and intimate partner violence (Ogbu-Nwobodo et al., 2022). These marginalized populations are not only more likely to seek termination care at higher rates than non-marginalized populations but are also more frequently denied abortion care, resulting in more pronounced mental health and well-being consequences. These consequences include, but are not limited to, heightened levels of stress, increased anxiety, and lower self-esteem (Biggs et al., 2017). With respect to tightness, we can conclude that such challenges are particularly exacerbated for marginalized individuals,

particularly in the Deep South (Altındağ & Joyce, 2022), who seek abortion care in states with more stringent regulations.

Notably, four states have resisted court orders aiming to impose stricter regulations or bans on abortion access. These states fall within the middle range of the tightness-looseness continuum, with Montana being the loosest (46.11), followed by Iowa (49.02), Wyoming (51.94), and Ohio as the tightest (52.30). However, the reasons and motivation behind these blockings differ. For instance, Montana's Supreme Court blocked the ruling, affirming that 'abortion is a right protected by the state's Constitution' (Batha, 2023). In contrast, Iowa and Wyoming have temporarily blocked bans pending legal proceedings (Batha, 2023). Notably, in Ohio, where the abortion issue was put to a vote, citizens chose to add abortion rights to the state's constitution, automatically putting the reinstatement of a six-week ban on hold (Batha, 2023). Understanding the nuances of these blocked bans is challenging due to the ever-changing political landscape and the continuous passage of various laws. Nevertheless, it is crucial to explore how states positioned between the tight and loose ends of the continuum are navigating the complexities of abortion policies.

4.5 Exploratory Analysis

4.5.1 Tightness-Looseness X Abortion Access

To explore whether state mindset scores (tighter-looser) and abortion policies (protections in place vs. ban blocked vs. greatly restricted) were significantly related, an analysis of variance (ANOVA) was conducted. The model produced statistically significant results between the groups, such that people living in states with different abortion legislation produced different mindset scores ($F_{2, 47} = 21.82$, $p < 0.001$, $\eta^2 = 0.481$). Specifically, we found that states with restrictive abortion policies were more likely to be coded as culturally ‘tight’ (*M = 59.81, SE = 2.02*) compared to states with more progressive abortion policies (i.e., where legislation protects access to abortion; *M = 41.54, SE = 1.89,* see Table 2). These findings further support the visualization and breakdown of the policies highlighted in the regional map above, which indicate trends between tighter states enforcing more restrictive abortion policies and looser states upholding protective policies via access to legal abortion under more circumstances (e.g., during later gestational stages/ages) and protections for people who access and provide termination care (e.g., shield laws and buffer zones).

Table 2. Post Hoc Comparisons - Tightness-Looseness and Abortion Access

Comparison		Mean Difference	SE	df	t	p_{holm}	Cohen's d
Greatly Restricted	Protections in Place	**18.28**	**2.77**	**47**	**6.60**	**<.001**	**1.97**
Ban Blocked	Protections in Place	9.25	4.55	47	2.03	.096	.99
Ban Blocked	Greatly Restricted	-9.03	4.61	47	-1.96	.096	-.98

Bold print indicates statistical significance.

4.6 Discussion

When highlighting the state-by-state policies, it is evident that as state mindset scores increase, their policies for sex education and access to sexual healthcare become more restricted or regulated. In relation to Gelfand and colleagues (2011) work, these patterns are indicative of tighter states maintaining robust social norms, including conservative values regarding pre-marital sex; lower tolerance for behaviors considered 'deviant', such as non-heterosexual sex and LGBTQ+ community engagement; and lastly, these tighter states tend to impose significant penalties for unlawful violations, such as the criminalization of abortion and the implementation of bounty laws.

With regard to sex education, social policies in these tight contexts become more restrictive in their mandates concerning what information can be taught (e.g., contraceptive use) and less inclusive towards non-heterosexual and non-cis-gendered individuals. These patterns are in line with tighter states upholding traditional values (Harrington & Gelfand, 2014), which are restrictive to heteronormative and cisnormative narratives. Such restrictive mandates hinder an individual's ability to engage with age-appropriate material and information that will bolster self-esteem and normalize marginalized communities. Specifically, the research underscores how restrictions related to sex education (e.g.,

abstinence-only focused curricula) perpetuate sexist and heterosexist stereotypes (Hoefer & Hoefer, 2017), as well as stigmatization toward individuals who violate norms around heteronormativity (Heels, 2019).

Gay men and lesbian women frequently report experiences perceived as violations of heteronormativity, often associated with stigmatizing encounters related to norm violations. These incidents encompass sexual identity-based discrimination, harassment, and violence, as indicated by research conducted by Worthen and Jones (2023). While these findings are representative across the United States, we contend that such instances of discrimination, harassment, and violence linked to sexual identity may be more pronounced in environments characterized by 'tightness'. This assertion aligns with the work of Jackson et al. (2019), who observed a positive association between tightness and implicit racism and anti-gay prejudice. According to Hoefer and Hoefer (2017), there is evidence that young women of color - who participated in abstinence-only sex education - in the Deep South were frequently assumed to be more sexually active than they actually were. Such observation underscores the influence of sexist stereotypes that are perpetuated by abstinence-only curricula within a state characterized by stricter sexual education policies.

The broader literature examining the interplay between tightness-looseness and health-related vulnerabilities underscores consistent findings. Harrington and Gelfand (2014) reveal higher rates of HIV and Chlamydia in states with tighter cultural norms compared to those with looser norms - a trend further substantiated by the 2021 CDC statistics outlined in section 4.2. While acknowledging that factors such as poverty and socio-economic conditions contribute to disease prevalence, a critical question arises: could the resistance to implementing comprehensive sex education be a significant driving force behind these concerning statistics? Support for this claim emerges from research indicating that tighter states consistently align with political conservatism and right-wing authoritarianism (Qin et al., 2023). Indeed, Jackson et al. (2019) explain an individual's voting behavior can be described by a perceived threat. When individuals reported greater levels of perceived threat by minority groups (ethnic minorities and sexual minorities), they voted for more politically conservative candidates (e.g., Donald Trump) to 'restore order' and 'maintain predictability' (Jackson et al., 2019). Moreover, a parallel line of inquiry reveals that politically conservative voters in these states are more likely to believe that access to comprehensive sex education will increase casual sexual activity among school-aged children (Bleakley et al., 2020). Despite this belief, extensive research consistently demonstrates that access to comprehensive sex education delays rather than accelerates one's sexual debut (Kohler et al., 2008). These

insights into voting behavior, perceived threat, and resistance to comprehensive sex education within tighter states provide a compelling context that may, in turn, contribute significantly to the elevated rates of STI transmission reported by Harrington and Gelfand (2014).

In terms of abortion regulation, tighter states impose obstacles, including limitations on gestational ages, requirements for multiple doctor visits, and specific rationales such as endangerment to the mother's life. These restrictions, linked to heightened barriers, particularly affect marginalized groups disproportionately (Altındağ & Joyce, 2022). Consequently, these barriers contribute to diminishing residents' bodily autonomy and undermine their sense of security in curating a future aligned with their individual goals and aspirations. One might argue such barriers are in relationship to the extensive regulation of women's bodies and autonomy.

Recent findings affirm that states characterized by cultural tightness exhibit stronger adherence to conservative religious beliefs and endorse traditional, patriarchal gender roles (Qin et al., 2023). This includes the promotion of traditional gendered expectations, where women are expected to be inherently nurturing, kind, sexually chaste, and, when married, desiring children or pregnancy (Gardner, 2011). Within this framework, our findings are supported as abortion is viewed as a direct violation of these beliefs and, therefore, is often deemed impermissible unless under life-threatening circumstances.

Given these perspectives, it is not surprising that states with a higher prevalence of conservative values, such as Mississippi, Alabama, Arkansas, Oklahoma, and Tennessee, often enforce stringent regulations on women's sexual autonomy. This alignment is reinforced by the association between religious conservatism, adherence to traditional gender roles, and pro-life attitudes reported by Rye and Underhill (2019). Rooted in the belief that sex outside procreation and heterosexual relationships violates sexual morality and is considered unethical (Haidt & Hersh, 2001), conservative values contribute to the perspective that abortion should not be an option for non-procreative relationships. This viewpoint stems from the conviction that offering the choice of abortion undermines the consequences associated with pre-marital sex (Rye & Underhill, 2019), a characteristic often aligned with cultural tightness and stricter punishments.

In terms of punishing norm violators, in some drastic examples, tighter-state policies pin citizens against one another by incentivizing whistleblowers to expose fellow citizens who seek or access termination care. Such drastic measures can be further explained by literature outlining how women often face more severe consequences than men when violating established regulations, laws, ethical standards, and societal norms (Egan et al.,

2022; Heilman, 2012). As mentioned above, states that embrace conservatism and stricter societal norms and regulations (e.g., traditional patriarchal gender roles) tend to have increased accounts of gender inequalities (e.g., support for male dominance over women; Nayak et al., 2003). Such findings raise the question: could such attitudes drive extreme biases within policies that further criminalize women and gender-diverse people seeking abortion-related care?

It is noteworthy that there are no guidelines promoting or incentivizing the ability to sue individuals engaging in unsolicited, sexually suggestive gestures in public with the intent to harass, intimidate, or belittle others. These behaviors, predominantly carried out by heterosexual men and directed toward women, trans, and gender-diverse individuals, have been outlined in previous reports (Sallee & Diaz, 2013). Notably, patterns have been identified linking patriarchal power and privilege to sexual harassment and gender-based violence against girls and women (McLaughlin et al., 2012; Mackinnon, 1979). Alarmingly, when women speak out about such behavior, particularly in the workplace, they are often met with dismissive responses claiming the behavior was intended to be 'light-hearted and playful,' and that women are too sensitive when being 'admired' (McLaughlin et al., 2012; Quinn, 2002). Again, such findings provide examples related to women facing stricter punishments when violating established norms and expectations about their behavior; as we outlined above, traditional beliefs tend to endorse the notion that women will be agreeable, kind, chaste, and nurturing (Gardner, 2011).

Importantly, the relationship between socio-cultural factors (e.g., tightness-looseness, gender (in)equality, social and political conservatism, or liberalism) and sexual healthcare is not limited to just the USA. In fact, numerous countries are facing challenges in implementing access to sex education and reproductive healthcare. Tighter countries to mention are Pakistan, Malaysia, India, Singapore, and South Korea (Gelfand et al., 2011), all of which hold laws that restrict access to contraceptive and reproductive healthcare (Monga et al., 2020; Low et al., 2014; Singh et al., 2018; Gosavi et al., 2016; Moon et al., 2023). In particular, we see the theme of ambiguous language noted as a barrier in many cases. For example, Pakistani law was last updated in 1990 to allow for abortion until 12 weeks gestation for "necessary treatment" (Monga et al., 2020). The case within Malaysia becomes more ambiguous as they uphold a dual system concerning their laws, inclusive of a) Civil Law, which allows for abortion in life-saving circumstances or for preserving the well-being of the pregnant person, and b) the Syariah Law, only applies to Muslims, which outlines accessibility of abortion until 4-months gestation but only in life-threatening circumstances or

if abnormalities are present (Low et al., 2014). The language used in both examples from Pakistan and Malaysia highlights the inherent ambiguity within social policies. The ambiguity leaves room for individual interpretation and allows healthcare providers to integrate their own religious or cultural values into decision-making when determining whether or not to provide abortion care (Monga et al., 2020; Low et al., 2014).

To further demonstrate the presence and maintenance of patriarchal gender norms within tighter cultures, it was not until a recent 2021 court order that overruled South Korea's near-total abortion ban, which also mandated spousal approval for married women who sought abortion procedures (Yoon, 2022; Moon et al., 2023). Likewise, in Malaysia and before 2011, access to contraceptive care was only offered to married women within the public health sector. Even though single women could seek contraceptives from private clinics, this option limited accessibility as the ability to travel to and afford the increased (i.e., privatized) price of the contraceptive was a barrier posed to many single women (Low et al., 2014).

On the other hand, when evaluating countries coded as 'loose' - Estonia, Netherlands, New Zealand, and the United Kingdom (Gelfand et al., 2011) - we see laws and legislative policies that provide similar protective measures to an individual's right to termination and sex education information as we did in looser regions of the United States (Oja, 2017; McCulloch & Weatherall, 2017; Moon et al., 2019; de Moel-Mandel & Shelley, 2017). For example, within New Zealand, abortions are legal until 20 weeks gestation. Notably, after the 20-week mark, termination is still a legal option, though the clinician must take extra safeguarding measures (Ministry of Health, 2023). Indeed, the Netherlands is known for its sex-positive policies towards the implementation of sex education (e.g., mandatory lessons on sexual development, sexual diversity, and sexual assertiveness; Katz, 2018) and is associated with some of the lowest teen pregnancy rates in Europe (Leung et al., 2019). Of course, this is not to state that 'looser' countries are free from barriers to inclusive and accessible sex education and reproductive healthcare (as we have just seen demonstrated within the US, a 'looser' country; Harrington & Gelfand, 2014). Instead, this illustrates patterns and relationships between the tightness-looseness framework and matters related to sexual healthcare. Taken together, we can conclude that clear trends exist between the tightness-looseness framework and sexual health-related outcomes: Sex Education and Abortion Legality.

It is evident that looser states and countries often take the approach that inclusive and comprehensive sex education is key, as these cultural contexts are more inclined to protect

the right to information (see Table 1). These contexts are also more likely to provide legal access to abortion (see Table 2), and contraceptive care in a greater variety of cases (e.g., due to circumstances, reasoning, gestation), and as such, people living in these cultural contexts have greater bodily autonomy and freedom to exercise a greater variety of reproductive decisions. On the other hand, tighter states implement regulations to try and stop behaviors perceived as socially deviant or a violation of traditional and religious values (e.g., stricter religious values uphold sexual purity practices and enforce consequences to 'deviant' practices; Haidt & Hersh, 2001; Rye & Underhill, 2019).

In short, recognizing and understanding mindset at the state level is pivotal for gaining profound insights into current events and policy dynamics, significantly enhancing our understanding of societal attitudes. Indeed, state mindset provides a critical perspective to anticipate potential legislative shifts, especially in the aftermath of regulations like Roe v. Wade being overturned. For example, recent developments, such as the contemplation of an IVF ruling in Alabama (nicely articulated by Marquez, 2024), showcase how state mindsets influence reproductive rights legislation. Advocates for reproductive rights can leverage this knowledge to their advantage by anticipating potential legal changes and proactively bringing awareness and education to communities that are most vulnerable. By staying informed about the values within each state, reproductive rights advocates can strategically engage with local populations, fostering dialogue and education that align with prevailing mindsets. This proactive approach positions advocates to foreshadow potential laws, effectively shaping public discourse and influencing policy outcomes in support of reproductive rights. In essence, understanding state mindset scores becomes a powerful tool for reproductive rights advocates, enabling them to navigate and respond to evolving legislative landscapes with targeted awareness and education initiatives.

This chapter aimed to illustrate the relationship between two key variables central to the upcoming chapter: tightness-looseness and sexual health. It specifically explored how mindset varied within a 'loose' nation, warranting further examination at the individual level. The following empirical chapter will build on these findings to explore if/how mindset impacts individual outcomes after engagement within a gamified sexual health program.

Chapter 5: Mindset & Sexual Health: Does mindset impact receptiveness to sexuality education curricula?

5.1 Introduction

A large, and growing, body of literature suggests there are tangible benefits associated with sexual health training programs, including providing needed support and representation for LGBTQ+ adolescents (Meadows, 2018), lower rates of homophobic bullying (Baams et al., 2017), greater acceptance of gender diversity (Richard et al., 2015), reduced rates of dating violence (De La Rue et al., 2014), and improved relationship skills (Rice et al., 2017). However, not all sexuality and relationship education curricula are created equal, and young people identify several issues associated with the content and dynamics of some curricula (e.g., receiving biased or discriminatory information) which limits the experienced benefits of sexual health training programs, and in some cases may do more harm than good (Pound et al., 2016). Indeed, effective implementation of sexuality and relationship education is hindered by the presence of multi-faceted barriers. These barriers are inclusive of, but not limited to, cultural, political, and religious influences (see Hall et al., 2016); social stigmas and taboos related to sex and sexuality (see Kebede et al., 2014); neuro-typical and non-disabled focused curriculum which excludes individuals living with visible and invisible disabilities (see Esmail et al., 2010); lack of LGBTQ+ inclusivity (see Garg & Volerman, 2021). These barriers lead to a host of negative outcomes, such as misinformation and myth endorsement (Akalin, 2022), narratives that perpetuate heteronormativity (Garg & Volerman, 2021), and limited knowledge about sexually transmitted infections (STIs), which is in turn linked to stigma and shame surrounding transmission of STIs (Hutchinson & Dhairyawan, 2018). Further, those who receive poor sexuality and relationship education report difficulty exercising agency over sexual decision-making and enthusiastic communication around consent (Agtarap & Adair, 2023) and are less likely to have their unique relationship dynamics and sex/gender identities represented (Mayo, 2022). Apart from these structural, societal, and institutional barriers, we argue that individual differences likely shape the outcomes of sexuality education. This research is designed to address the inconsistent outcomes associated with exposure to sexuality education curricula; specifically, we employed a pretest-posttest experimental design to assess the extent to which mindset (tightness-looseness) might affect attitudinal shifts following engagement with a gamified sexuality education program.

Sexuality and relationship education is typically described as an age-based educational program that aims to provide individuals with information, skills, and knowledge related to aspects of sexuality and relationships (e.g., puberty, contraception, sexually transmitted infections, respect, and consent; World Health Organization, 2023). Given the relationship between sociocultural context and sexuality education attitudes and practices (Browes, 2015; Leung et al., 2019; Vanwesenbeeck et al., 2015), the content of these curricula vary from region to region; for example, in the UK relationships and sex education (RSE) is compulsory for all secondary students (aged 11 - 16) and addresses topics relevant to families and relationships (e.g., how to recognize safe and unsafe relationships for oneself and others), digital spaces (e.g., the distorted or unrealistic nature of sexually explicit content like pornography), safety (e.g., communicating and recognizing consent), and sexual health (e.g., contraceptive choices and reproductive health; Department for Education, 2021). Although most sex education curricula are delivered in school settings, online platforms are becoming increasingly integrated into adolescents' and young adults' educational experiences (Lameiras-Fernandez et al., 2021). While sexuality educators are concerned that online programming is less engaging (Horan et al., 2023), research suggests that in-person and online instructional methods produce similar outcomes (e.g., attitudes towards gender diversity; Green, 2014) and that adolescents already use digital spaces to get information and advice about sexual health (Simon & Daneback, 2013). As such, online or web-based programs provide a convenient avenue to conduct research on individual differences in attitudinal changes following engagement with sexuality and relationships education in a space that offers several unique advantages to learners (e.g., students often feel more comfortable expressing themselves in digital spaces; Green et al., 2015). In this study, we used an online platform to deliver a gamified sexual health training program and measured the extent to which engagement with this program produced changes in several key attitudinal outcomes (i.e., STI-related stigma and shame, sexual self-efficacy, comfort with sexuality, and sex guilt) immediately following exposure and after a 1-week delay.

5.1.1 Web-Based Sexual Health Training Programs

Much of the literature highlights the efficacy and feasibility of online health training programs, not only with respect to sexual health (Widman et al., 2017; Widman et al., 2020) but also on topics like postabortion care (Gill et al., 2019), sexual abuse (Rheingold et al., 2012), drug use and intimate partner violence (Choo et al., 2016), personality disorders

(Lobban et al., 2017), anti-smoking (Cupertino et al., 2019), and perinatal mental health (Kingston et al., 2017). Apart from the efficacy and feasibility, the virtual aspect of these programs allows for greater breadth (e.g., further outreach within and across nations) and depth (e.g., scope for experimental studies that can analyze predicted cause-and-effect relationships). Furthermore, online platforms are a safe, anonymous space for participants to engage with material that may be sensitive or deemed uncomfortable for in-person studies. They also ensure exposure to standardized material and do not require much financial overhead (Levine, 2011; Tortolero et al., 2009).

A review of digital technologies promoting sexuality and reproductive health finds that across ten studies, participants' overall attitudes and opinions towards web-based sexual health training programs were positive (Guse et al., 2012). Indeed, in another report, participant responses indicated a preference for online versus in-person programs (Marsch et al., 2011). Such work provides a foundational rationale for our employment of an online, gamified sexual health training program, ensuring standardized material is disseminated, greater reach throughout the United Kingdom, and, hopefully, increasing comfort and engagement for recruited participants. A gamified education program is an approach to learning that seeks to motivate students through game design elements, including animations of characters and dialogue between characters and the player, as well as quizzes and feedback (Kapp, 2012). The gamification of an online program typically differs from a purely online interactive program in that an interactive program requires some form of participation from the user (e.g., discussion forums). However, it does not mean that the program will have adopted game elements (e.g., animations). Simply put, all gamified programs are interactive, but not all interactive programs are gamified.

Over the years, researchers have documented the effects of various training programs for sexual health promotion against a range of outcome variables. For instance, self-efficacy - perceived confidence to perform a task or behavior (Moyer-Gusé, 2011) - has been explored using interactive sexual health narratives via television programs (Moyer-Gusé, 2011), interactive computer-based programs (Bailey et al., 2012), multimedia programs (Mustanski et al., 2015), and web-based prevention programs (Bergenfeld et al., 2022). No matter the program, each training program was associated with significant changes in reported self-efficacy, whether that was for general sexual communication self-efficacy (Bergenfeld et al., 2022; Moyer-Gusé, 2011), safer sex and condom self-efficacy (Bailey et al., 2012) or

coming-out self-efficacy for queer-identifying individuals (Mustanski et al., 2015). Taken together, it is clear that participating in some form of sexual health program can lead to increased self-efficacy concerning varying sexual health matters, including sexual communication and condom use, and when disclosing sexual orientation. Comfort with sexuality and sex-related guilt are other frequent variables measured within sexual health literature. Various articles outline the use of in-person programs (Çuhadaroğlu, 2017; Kamala et al., 2017; Rooks-Ellis et al., 2020) and web-based platforms (Weerakoon et al., 2008; Goh et al., 2023) targeting these variables. Such research does indeed find that both in-person and online programs can produce significant reductions in sex-related guilt and increased comfort regarding past sexual experiences and sexual differences.

The majority of sexual health training programs are rooted in psychological and health behavior change theories, which typically emphasize the importance of educating young adults about sexually transmitted infections (STIs) to promote safe practices (Guse et al., 2012; Widman et al., 2017). Specifically, the existing body of research often focuses on the external factors influencing behavior change, such as condom use and lowering STI transmission rates (Lameiras-Fernandez, 2021; Widman et al., 2017). This contributes toward a lack of literature underscoring the significance of measuring an individual's personal experience with STI stigma and shame. This gap highlights the need for a more detailed exploration of the psychological dimensions surrounding education, aiming to address the emotional aspects that influence an individual's sexual health experiences with internalized STI stigma and shame (e.g., to what extent does an individual feel stigmatized when testing for an STI?). Notably, a breadth of literature explores the relationship between psychological factors (e.g., stigma and social support) and sexual health behaviors, for example, the role of stigma and shame for STI-testing intentions (Thomas et al., 2022), partner and family communication around positive test results (Scheinfeld, 2021), and seeking care upon a positive STI result (Theunissen et al., 2015). Again, and despite the importance of this research avenue, limited attention has been directed toward understanding the potential impact of sexual health training programs on an individual's personal experience with STI-related stigma and shame (Mulawa et al., 2021). Identifying this gap prompts a call for further research that delves into the personal dimensions of individual perceptions and experiences with STI-related stigma and shame within the context of sexual health training programs. Indeed, this study builds upon this gap in the literature by measuring STI-related stigma and shame before and after a gamified sexual health training program.

A critical review of key psychological factors within the domain of sexual health, including sexual self-efficacy, sex guilt, comfort with sexuality, and STI stigma and shame, highlights their malleability following exposure to and engagement with web-based sexuality and relationship education training programs. However, the literature fails to represent each of these variables within a gamified training program. Likewise, to our knowledge, current research has not explored the moderating effects of individual differences and how they may shape people's receptiveness to information learned within a web-based sexual health training program.

5.1.2 Individual Differences and Educational Research

Individual differences encompass the distinct psychological characteristics that vary across individuals, each contributing to every person's uniqueness or individuality (Baumeister, 2007). Previous research suggests this psychological individuality may impact people's engagement with learning material and educational topics. For example, factors such as personality traits and temperaments have been shown to correlate with key academic outcomes inclusive of performance (Poropat, 2009), dishonesty (Giluk & Postlethwaite, 2015), motivation (Dogan, 2015), and engagement (Qureshi et al., 2016). In addition to personality, learning styles have been found to predict educational performance outcomes (Komarraju et al., 2011). While some studies advise against relying too heavily on learning styles as a sole determinant of academic success (Kirschner, 2017; Newton, 2015), others encourage the exploration of individual differences, including personality and learning styles, and their relationship to both performance in (Nja et al., 2019) and satisfaction with web-based learning (Kauffman, 2015).

In educational research, the evaluation of a program's gamification efficacy, which refers to its ability to achieve a desired result, frequently includes the consideration and assessment of individual differences (Buckley & Doyle, 2017; Zaric et al., 2017), this ensures that the program operates efficiently for each user. When assessing individual differences, researchers can emphasize and leverage such attributes to create tailored educational programs, ultimately aiming to optimize the educational journey for each learner. For example, research by Hwang and colleagues (2012) suggests that students' motivation and receptivity increased when the gamified learning program matched their learning preferences (e.g., visual vs. verbal; sequential vs. global). Indeed, our study is set as an exploratory study to assess if individual differences also play a role in sexual health-related material.

Importantly, the gamified program implemented within this study is not set to conform or fit certain personality traits or learning styles but rather acts as a proof of concept to understand how participants respond to sexual health-related variables within the gamified program, which can then be used as preliminary evidence for future researchers or educators to develop individualized programs. Ultimately, we argue that further evaluation of individual differences in the context of sexual health engagement will enhance our understanding and the potential for success in the development of future sexual health training programs.

Apart from evaluating individual differences specific to the outcomes within a gamified program, some literature outlines individual difference factors related to sex education information seeking. Indeed, researchers report differences in information-seeking behaviors amongst youth, explaining that females were more likely to seek information from professional websites, whereas men were more likely to engage in general online user-generated content (Nikkelen et al., 2019). With respect to online engagement, individuals with a general sense of sexual curiosity and higher sexual self-esteem tended to engage in social media for interactive sex education content; conversely, individuals who held more sexual experiences or experienced sexual health problems were more likely to seek information from professional health websites, as were individuals who openly spoke about sex with their friends (Nikkelen at al., 2019; Bleakley et al., 2009). Similar results are outlined in another report where youth sought professionals regarding more biological aspects of sex (e.g., reproduction and puberty) but pursued informal sources (e.g., online media, magazines, and even music videos) for more 'taboo' topics (e.g., sexual pleasure; McKee, 2012). Such information showcases how individual factors impact the way in which an individual engages in seeking sex education-related material. However, a significant gap in the literature persists, as this existing research predominantly examines how or with whom individuals seek out sex education information rather than evaluating how individual differences may impact a person's receptivity to sex education material.

Overall, the literature outlined here showcases the versatile application of individual differences in educational research, and, of particular interest, the research highlights how individual differences might affect receptivity to and outcomes of online education programs. This manuscript will further focus on how acknowledging individual differences can better inform personalized approaches within sexual health education to meet the needs of all

individuals and populations more equally. As such, we propose that mindset is an individual difference factor that has been under-explored in the existing literature and that mindset might shape individual learning outcomes following exposure to a gamified sexual health training program.

5.1.3 Mindset: Tightness-Looseness

Mindset is conceptualized as a cognitive spectrum ranging from "looser" to "tighter" orientations. According to Gelfand (2019), tighter mindsets, or groups of people living in tighter cultures, display strict adherence to rules and social norms, punish norm violators, and hold a strong desire for predictability and maintaining order. Looser mindsets, or groups of people living in looser cultures, display greater flexibility in social behaviors, higher tolerance of norm violation, and express values that prioritize innovation, diversity, creativity, and risk-taking (Gelfand et al., 2011; Gelfand et al., 2006).

Though limited research has been conducted concerning mindset and sexual health-related attitudes or experiences, there is much research evaluating tightness-looseness and various connections to prejudice on the societal and cultural levels. Researchers suggest that tightness consistently predicts prejudiced attitudes towards individuals of ethnic and sexual minorities, differing religious backgrounds, and individuals who cohabitate before marriage (evaluated across 25 nations; Jackson et al., 2019). Indeed, when evaluated at the state level within the United States of America (USA), tightness was positively associated with implicit anti-gay and racist attitudes (African American vs. Caucasian; Jackson et al., 2019).

Another report explains that looser US states tended to allow for a more inclusive definition of the 'American identity' (e.g., greater acceptance for Asians and Indigenous Americans and sexual minorities being included within the normative definition; Lopez et al., 2022). On the other hand, the tighter states associated the American identity with White people who held hierarchical status and power (Lopez et al., 2022). Moreover, Jackson and colleagues (2019) found that American voters perceiving a threat to their country were more likely to support Donald Trump, a politician recognized for his anti-abortion stance, contradictory support for the LGBTQ+ community, and restrictions on minority groups (e.g., surveillance of Mosques and proposing the Mexico border wall). Jackson and colleagues (2019) explain this preference for Trump was entirely accounted for by their endorsement of cultural tightness and prejudice. Such findings are unsurprising as tighter mindsets correlate

to the preference for stricter regulations and norm adherence. Indeed, Lopez and colleagues (2022) argue that in states with stricter norms, non-binary and gender-expansive individuals may be perceived as diverging from heteronormative standards, while ethnic minorities might be viewed as a threat to order and predictability due to racial stereotypes associating them with violence and crime.

Given the established connection in the literature between tightness-looseness and prejudiced attitudes and behaviors, this study seeks to investigate whether mindset plays a moderating role in individuals' receptivity to information about sexual health. The field of sexual health covers numerous stigmatized topics (e.g., gender diversity, sexual pleasure, abortion, and more) such topics are consistently viewed as taboo and politically polarizing and are frequently deemed threatening or sensitive due to cultural, political, and religious considerations (Hall et al., 2016). Therefore, this manuscript explores whether tightness-looseness as an individual-level variable moderates receptiveness before and after exposure to a gamified sexual health training program.

5.1.4 Current Study

This manuscript describes the effect of a gamified sexual health training program on several key psychological factors (e.g., STI-related stigma, STI-related shame, sexual self-efficacy, comfort with sexuality, and sex guilt) and explores the potential moderating effect of mindset. Within this study we test three hypotheses: [H1] all psychological factors will shift immediately after participation in the training program. Specifically, STI-related stigma, STI-related shame, and sex guilt will decrease; whereas, sexual self-efficacy and comfort with sexuality will increase, [H2] we predict that the first hypothesis is maintained for the full 1-week measurement delay, and [H3] we predict main and interaction effects of mindset to be more true for "looser" rather than "tighter" mindsets. For the main effect, people with looser mindsets will report lower levels of sex guilt, STI-related stigma, and STI-related shame and higher levels of sexual self-efficacy and comfort with sexuality. For the interaction effect, people with looser mindsets will showcase greater shifts in their scores after the gamified sexual health program in comparison to people with a tighter mindset.

5.2 Methods

5.2.1 Participants

Between June 2022 and January 2023 one hundred and twenty-five participants (61 female, 60 male, and 4 non-binary) were recruited via Prolific (N = 108) and social media (N = 17). The Prolific participants were compensated a total of £11 via Prolific payment, which was dispersed at the completion of each phase (Time 1 = £1.50, Time 2 = £6.00, and Time 3 = £3.50). As social media participants were compensated upon completing all three time points, they received a slightly larger amount, a £15 Amazon Voucher. Participants ranged from 18-26 years old (M = 22.09, SD = 2.10), with the majority identifying as heterosexual (N = 87; 19 bisexual, 10 gay/lesbian, 4 prefer not to say, 3 pansexual, 2 asexual). As the gamified sexual health program was originally designed for teens, we decided to limit the inclusion criteria of respondents to be between 18-26 years old for quality assurance purposes. All participants resided in the United Kingdom and were able to read and write in English. Participants were also required to have access to a desktop computer that had audio to complete the sexual health training section of the study.

5.2.2 Procedure and Materials

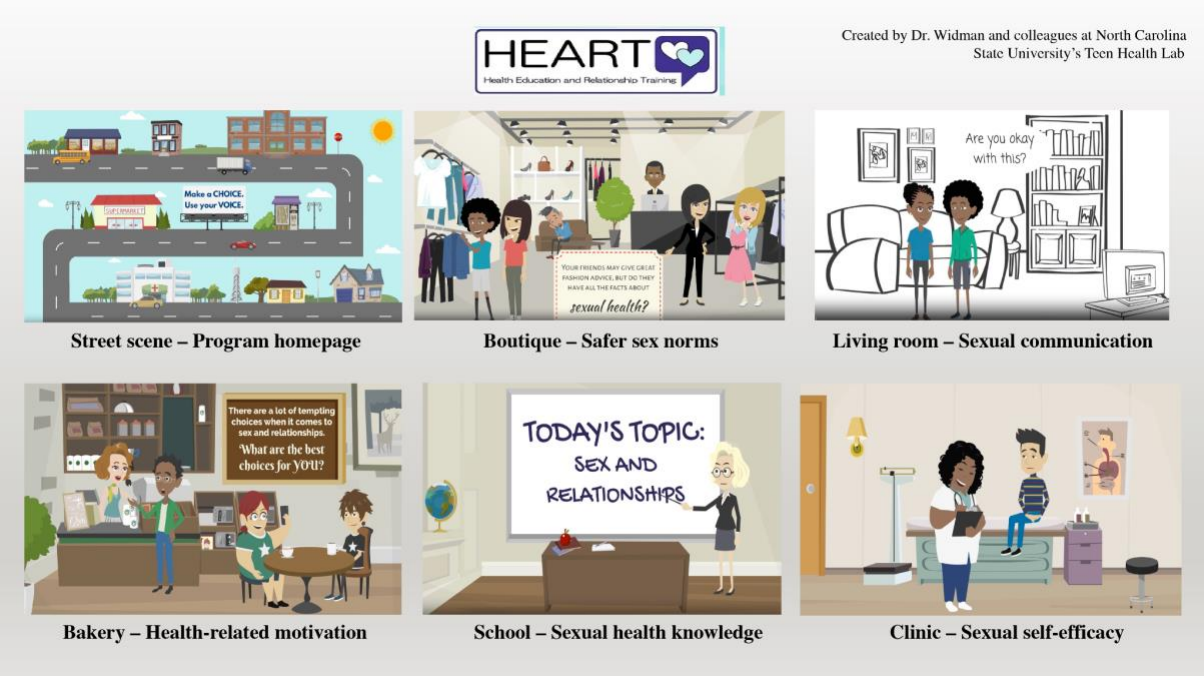
Participants were invited to participate in the study, which was approved by the College of Health, Medicine, and Life Sciences Ethics Committee at Brunel University London, via advertisements on either Prolific or various social media platforms (e.g., Instagram and Twitter/X), anonymous Qualtric links were embedded for the participant to read the participant information sheet, which explained the study protocol, aims and objectives, data protection policies, and sign the consent form. Participants' mindset and scales related to attitudes and beliefs about sexuality were assessed at three separate time points: pre-training (Time 1), immediately after sexuality training (Time 2), and post-training (Time 3); each phase was completed via Qualtrics at 1-week intervals.

Within the first phase, pre-training (Time 1), participants (N=125) reported demographic information (e.g., age, gender, and sexuality) and completed measures of tight-loose mindset (modified version of Gelfand et al., 2011), sexually transmitted infection (STI)-related stigma and shame (Foster & Byers, 2008), sexual self-efficacy (JSI Research, 2000), sexual guilt (Janda & Bazemore, 2011), and comfort with sexuality (Tromovitch, 2000). On average, participants completed this section within 10 minutes. In the second phase

(Time 2), participants (N=98) took part in a gamified, web-based sexuality education training program. This 45-minute Health Education and Relationship Training (HEART; Widman et al., 2020) program was designed and developed by Dr. Laura Widman and researchers within the Teen Health Lab at North Carolina State University. In collaboration with Dr. Widman and colleagues, an anonymous link was embedded in the Qualtrics survey, which opened the HEART program within a new window. HEART, consisting of five modules, offers a gamified and interactive learning experience to empower individuals to make informed decisions and foster sexual autonomy. The modules included: 1) Health-related motivation, 2) HIV/STI knowledge, 3) Self-efficacy, 4) Social norms, and 5) Sexual communication skills (see Figure 1).

Figure 1

Overview of the HEART program and featured modules.



The training program presents relevant topics via short video clips set in everyday environments such as coffee shops, bakeries, classrooms, and clothing boutiques. Participants engage in interactive sessions, including Q&A sessions, myth-buster segments, and quizzes. In the final stage, participants listen to clips on sexual consent scenarios, where they practice articulating their responses back to the animated character. They further engage in goal-setting exercises and offer advice to characters within the program based on their knowledge

gained from the training. Upon completion of the HEART program, participants were provided with a unique completion code, instructed to return to the initial Qualtrics survey, input the code, and then asked to complete the outcome measures: STI-related stigma and shame, sexual self-efficacy, sexual guilt, and comfort with sexuality scales. On average, participants completed this stage within 50 minutes (45-minute HEART program, 5-minute questionnaire). The last phase, post-training (Time 3), consisted of the participants (N=87) completing the STI-related stigma and shame scale, sexual self-efficacy scale, sexual guilt scale, and comfort with sexuality scale. On average, the final stage was completed within 5 minutes. As a whole, this pretest-posttest experimental design consisted of three phases: pre-training [*Time 1*] (N=125), training and outcome assessment [*Time 2*] (N=98), and post-training [*Time 3*] (N=87).

5.2.2.1 Mindset

To assess mindset, the tightness-looseness mindset scale (Gelfand et al., 2011) was modified using individual-level items from Gelfand's (2021) "Mindset Quiz: How Tight or Loose Are You?". Specifically, the scale was developed by modifying one item from Gelfand and colleagues' work in 2011 from the country level (e.g., "There are many social norms that people are supposed to abide by in this country") to the individual level (e.g., "I abide by the social norms that are present in the country that I currently reside in") and using five items from Gelfand's individualized quiz (e.g., "I stick to the rules"; 2021). Each individualized item from the quiz was selected to closely align with the remaining five items within Gelfand's well-used and validated cultural mindset scale (Gelfand et al., 2011), representing an effort to modify their validated 6-item scale (see Appendix C, Table 1). Participants were asked to rate how each statement represented their own mindset on a scale from 1 (strongly disagree) to 4 (strongly agree). Composite scores were created by averaging responses across all six items. The higher the participant scored, the 'tighter' their mindset (e.g., greater adherence to social norms); the lower the score, the 'looser' the mindset (e.g., lesser adherence to social norms). Internal consistency was poor for all six items ($\alpha = .47$); however, after dropping item six ("In social situations, I have the ability to alter my behavior if I feel that something else is called for"), the scale achieved moderate reliability ($\alpha = .55$). As such, all subsequent analyses and scores exclude item six. While estimates of reliability were low, Cronbach's α values in this study are consistent with those found by previous researchers who employed Gelfand et al.'s (2011) tightness-looseness scale modified from

cultural norms to sexuality norms (Jamshed et al., 2022) and gender norms (Wormley et al., 2021). Furthermore, previous research demonstrates the reliability and validity of the original scale (Kim et al., 2022; Liu & Xiaoyuan, 2023; Marcus et al., 2022). Lastly, it's important to consider that scales represented by fewer items (typically less than 10 items) are often cited for having lower Cronbach alpha levels (Graham, 2006; Tavakol & Dennick, 2011).

5.2.2.2 STI-related Stigma and Shame

The revised STI-related Stigma and Shame Scale (Foster & Byers, 2008) was used to assess STI-related stigma and shame. This 14-item scale comprised two components: shame (e.g., "If I were to test positive for an STI, I would feel ashamed") and stigma (e.g., "Only promiscuous people contract STIs"). Participants indicated their degree of agreement on a scale ranging from 1 strongly disagree to 4 strongly agree. Composite scores were produced by averaging items 1-7 for STI-related shame and items 8-14 for STI-related stigma, where higher scores were indicative of stronger anticipated STI-related shame and stronger endorsement of STI-related stigma. Good internal reliability was achieved for each variable across all time points: Shame (Time 1 $\alpha = .88$, Time 2 $\alpha = .88$, and Time 3 $\alpha = .89$) and Stigma (Time 1 $\alpha = .82$, Time 2 $\alpha = .81$, and Time 3 $\alpha = .85$).

5.2.2.3 Sexual Self-Efficacy

To assess sexual self-efficacy, the Sexual Self-Efficacy Scale (JSI Research, 2000) was used. This six-item scale drew on individuals' perceived confidence to express and communicate desired practices before or during intimacy. Three of the six items assessed contraceptive use (e.g., "Ask your partner to wait while you got a condom or dental dam"), while the other items inquired about communication (e.g., "Communicate to your partner about how to treat you sexually") and boundaries (e.g., "Refuse to engage in sexual practices you didn't like"). Participants responded on a 4-point scale ranging from 1 (Not at all confident) to 4 (very much confident). Composite scores were produced by averaging all six items, where a higher score indicated greater levels of perceived sexual self-efficacy. Good internal consistency was achieved across each time point: Time 1 $\alpha = .84$, Time 2 $\alpha = .88$, and Time 3 $\alpha = .91$.

5.2.2.4 Comfort with Sexuality

The Multidimensional Measure of Comfort with Sexuality Short Form (MMCS1-S; Tromovitch, 2000) was used to assess an individual's comfort with sexuality. The scale consisted of nine items where participants reflected upon their comfort levels with previous sexual experiences (e.g., "My past sexual experiences and explorations have been very worthwhile"), sex-related communication (e.g., "I can freely discuss sexual topics in a small group of peers"), and sexual differences (e.g., "I am completely comfortable knowing and interacting with people whose sexual activities significantly differ from my own"). Participants marked their degree of agreement or disagreement on a scale ranging from 1 strongly disagree to 4 strongly agree. Composite scores were produced by averaging all nine items, where higher scores indicated greater comfort with sexuality and sexual issues. At each assessment point, good internal reliability was achieved: Time 1 $\alpha = .85$, Time 2 $\alpha = .88$, and Time 3 $\alpha = .87$.

5.2.2.5 Sex Guilt

The revised 10-item Brief Mosher Sex Guilt Scale (Janda & Bazemore, 2011) was used to assess levels of guilt associated with sexuality and sexual practices. Participants indicated their degree of disagreement or agreement with statements like "Masturbation helps one feel eased and relaxed" and "When I have sexual dreams I try to forget them" on a scale ranging from 1 strongly disagree to 4 strongly agree. After reverse scoring, composite scores were calculated by averaging the 10 items such that higher scores indicated higher levels of sexual guilt. Good internal reliability was met across each experimental phase: Time 1 $\alpha = .70$, Time 2 $\alpha = .62$, and Time 3 $\alpha = .69$.

5.2.3 Statistical Analysis

To test our hypotheses, we used a linear mixed-effects modeling approach, a specific type of multilevel model recommended for repeated measures and continuous outcome and grouping variables (Jiang, 2018). The formula for our mixed-effects model was as follows:

Outcome Variable ~ Mindset Scale * Time + (1 | Participant)

In this formula, the 'Outcome Variable' represents the score of STI-related stigma, STI-related shame, sexual self-efficacy, sexual comfort, or sex guilt - that is, each outcome

variable was assessed individually in a separate regression model. The mindset scale corresponds to the predictor variable assessing individuals' mindset scores. Time indicates each time point of data collection (Time 1, Time 2, and Time 3). The indication of '(1 | Participant)' represents the random intercept, which accounts for the individual variation among participants. This model allowed us to investigate how each outcome variable varied across time while accounting for individual differences across participants in our sample. The interaction between '*mindset * time'* further enabled us to explore the effect of mindset across each time point against each outcome variable (see Figures 2 and 3). Given the interaction term, all continuous variables (STI-Stigma, STI-Shame, sexual self-efficacy, comfort with sexuality, sex-related guilt, and mindset) were centred. When interactions are included in the analysis, the coefficients for the main effects become contingent on the interaction term. Therefore, it is essential to standardize the variables to ensure that the main interaction effects can be consistently interpreted within the same model (Engqvist, 2005; Schielzeth, 2010). The subsequent sections provide a detailed examination of each outcome variable. A full breakdown of results can be found in Appendix C, Table 2.

5.3 Results

5.3.1 STI-related Stigma

To test H1 and H2, we conducted a simplified mixed effect model exploring STI-stigma scores before and after engagement with the HEART program while accounting for individual differences. Though this model did not produce statistically significant results; the patterns trended in the predicted order with main effects at Time 2 (b = -.06, SE = .03, t(188.55) = -1.89, p =.060) and Time 3 (b = -.06, SE = .03, t(189.20) = -1.74, p = .083) were slightly, but not significantly, lower than their scores at Time 1. Indicating that the sexual health intervention might have played a role in lowering STI-related stigma scores. To test H3, we used the full mixed effect model including stigma, mindset, and training time points. There were no significant main or interaction effects between mindset and stigma scores across the three assessment times (ps > .05). The results indicate mindset does not play a significant role when moderating outcome scores of STI-related stigma after a gamified sexual health program. Taken together, when evaluating STI-related stigma we fail to reject the null for H1, H2, and H3.

5.3.2 STI-related Shame

To test H1 and H2, we conducted a simplified mixed effect model examining the relationship between STI-shame scores at each time point while accounting for individual differences across the sample. The model showed a significant main effect where individuals' scores at Time 2 ($b = -.31$, $SE = .04$, $t(188.92) = -6.96$, $p < .001$) and Time 3 ($b = -.39$, $SE = .05$, $t(189.9) = -8.36$, $p < .001$) were lower than their scores at Time 1. These findings suggest that the HEART intervention significantly lowered participants' STI-related shame scores immediately following engagement with the program and 1-week after the intervention. However, when testing H3, the mixed effect model produced no main or interaction effects between mindset and shame scores over the three time periods. We can conclude that within our sample, mindset did not moderate the effect of sexual health programming on STI-related shame. As a whole, we reject the null for H1 and H2; however, we fail to reject the null for H3.

5.3.3 Sexual Self-Efficacy

To test H1 and H2, a simplified mixed effect model was used to explore sexual self-efficacy before and after the sexual health training program while accounting for individual differences. The model produced a significant main effect where individuals' scores at Time 2 ($b = .24$, $SE = .04$, $t(187.34) = 5.57$, $p < .001$) and Time 3 ($b = .16$, $SE = .04$, $t(188.52) = 4.14$, $p < .001$) were higher in comparison to their scores at Time 1. Following the HEART intervention, our participants reported increased sexual autonomy and increased confidence in communicating sexual wants and needs to their partners. When testing H3, the full model lacked significance; however, such results were trending in the predicted way. Specifically, individuals with a tighter mindset tended to exhibit higher sexual self-efficacy scores on average across each time point, $b = .24$, $SE = .112$ $t(168.32) = 1.93$, $p = .055$. Importantly, it was found that mindset did not moderate the intervention effect on sexual self-efficacy. We can conclude that our sexual health education program increased sexual self-efficacy at Time 2 and Time 3, supporting H1 and H2. Lastly, individuals with tighter mindsets might have higher sexual self-efficacy overall, but mindset did not moderate a relationship between sexual self-efficacy and engagement with the sexual health training program. Such results indicate the lack of support for H3, meaning we fail to reject the null.

5.3.4 Comfort with Sexuality

To test H1 and H2, a simplified model was used to evaluate comfort with sexuality scores before and after the sexual health training program while accounting for individual differences. The model produced a significant main effect where individuals' scores at Time 2 ($b = .18$, $SE = .04$, $t(190.33) = 4.63$, $p < .001$) and Time 3 ($b = .14$, $SE = .04$, $t(191.13) = 3.52$, $p < .001$) were higher in comparison to their scores at Time 1. These findings suggest that after participating in the sexual health training program, individuals felt more comfortable reflecting on and accepting their previous sexual history and speaking with others who engage in different sexual practices. Furthermore, testing H3 revealed a significant main effect and interaction effect. Individuals with a looser mindset tended to hold higher comfort scores on average across each time point than those with a tighter mindset, $b = -.26$, $SE = .12$, $t(158.03) = -2.11$, $p = .037$. Notably, this model suggested a significant interaction effect between mindset and comfort scores across each time point where individuals with a tighter mindset reported a larger increase in comfort scores at Time 2 ($b = .22$, $SE = .09$, $t(184.75) = 2.38$, $p = .019$) and Time 3 ($b = .20$, $SE = .10$, $t(186.03) = 2.11$, $p = .037$), in comparison to individuals with a looser mindset. We can conclude that mindset created differences in receptivity, such that individuals with tighter mindsets reported larger attitudinal changes (specifically in the domain of comfort with sexuality) following engagement with the sexual health training program. Taken together, this model yielded full support for H1 and H2 and partial support for H3 - such that the main effect of mindset was supported with looser mindsets reporting higher comfort scores; however, though there was an interaction effect of mindset, it was in the opposite direction (i.e., tighter mindsets showcasing greater attitudinal shifts).

5.3.5 Sex Guilt

Testing H1 and H2, the simplified mixed effect model for sex-related guilt and the sexuality training program yielded no significant results, suggesting that sex-related guilt did not change following exposure to the HEART program. Testing H3, the full mixed effect model, including mindset and guilt across each time point, a near-significant finding emerged for the main effect of mindset, where individuals with a tighter mindset tended to report higher sex guilt scores on average across each time point than those with looser mindsets, $b = .15$, $SE = .08$, $t(152.70) = 1.80$, $p = .079$. No interaction effects emerged within this model. Taken together, our data suggest that sex-related guilt was not affected by engaging with an

online sexual health training program, though mindset may be related to levels of sex-related guilt overall. Ultimately, we fail to reject the null for H1, H2, and H3

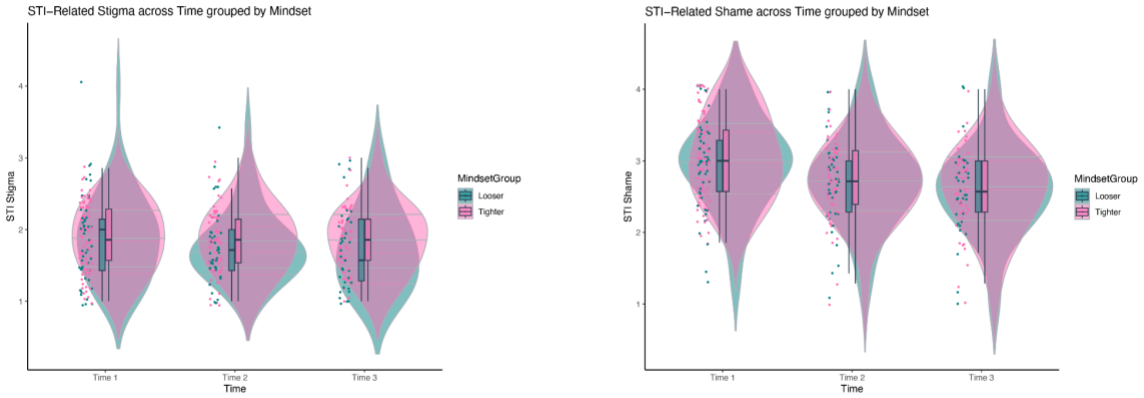


Figure 2: *Displaying STI-related stigma and shame across each time point, grouped by mindset.*

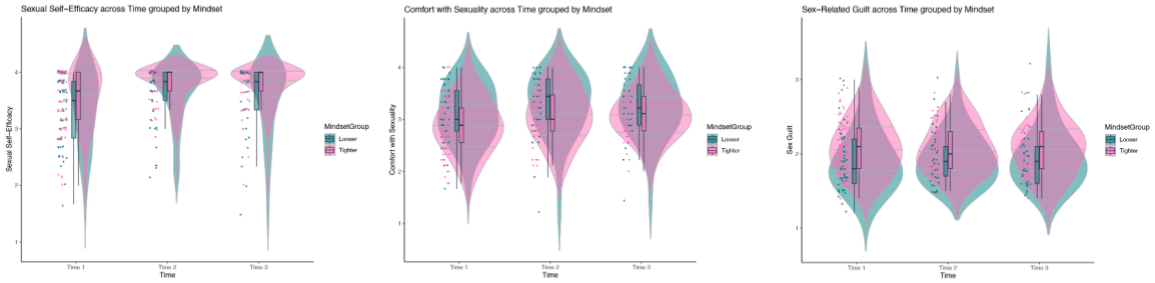


Figure 3: *Displaying sexual self-efficacy, comfort with sexuality, and sex guilt across each time point, grouped by mindset*

5.4 Discussion

In our study, we investigated the effect of a gamified sexual health training program on several key psychological factors (e.g., STI-related stigma, STI-related shame, sexual self-efficacy, comfort with sexuality, and sex guilt) and explored the potential moderating effect of mindset (e.g., tight or loose adherence to social norms). Engagement with the gamified sexual health intervention - HEART - was related to decreased STI-related shame and increased sexual self-efficacy and comfort with sexuality. The training program produced trending reductions in reported STI-related stigma but had no impact on sex-related guilt. Showcasing support for H1 and H2 for psychological factors of STI-related shame, sexual self-efficacy, and comfort with sexuality, but not for STI-related stigma or sex guilt.

With respect to H3, mindset did moderate the effect of the sexual health intervention on comfort with sexuality. Specifically, we find that individuals with a looser mindset reported greater comfort on average with their own sexual experiences, sex-related communication, and sexual differences (across Time 1, 2, & 3). However, we find that individuals with tighter mindsets reported larger increases in comfort both immediately following the training program (Time 2) and after a 1-week delay (Time 3). Although this finding challenges our initial predictions, it highlights the relationship between mindset and attitudinal shifts following a sexual health training program, such that those with tighter mindsets (e.g., stronger adhesion to social norms) reported larger shifts in sex-related comfort following the program. This could be attributable to several mechanisms, including: 1) individuals with tighter mindsets reported lower sex-related comfort before the training (Time 1), compared to those with looser mindsets, and therefore had the potential to experience larger changes in this attitudinal dimension and 2) having a tighter mindset may facilitate greater responsiveness to information presented during the sexuality training program, particularly information related to comfort (e.g., comfort with one's previous sexual experiences, comfort engaging in sex-related communication).

Overall, we can conclude that the gamified sexual health intervention produced changes in several sex-related attitudes, particularly those related to the self (e.g., comfort expressing one's own sex-related needs/wants) rather than those related to others (e.g., the extent to which one stigmatizes others for contracting an STI). Such findings allow for researchers, educators, and curriculum developers to consider how future online training programs or even in-person sex education programs may benefit from the consideration of the tightness-looseness framework (e.g., curricula for tighter mindsets might implement more

strategies that promote increased comfort with sexuality). As touched upon in the introduction, this gamified sexual health program was not to conform to learning styles or personality traits but rather to expand upon individual differences related to educational outcomes and how mindset might shape attitudes, experiences, and behaviors of sexual health-related variables.

When reflecting upon our outcome variables, there may be structural differences between STI-related stigma and shame on the one hand and sexual self-efficacy, comfort, and guilt on the other. It is possible that the gamified sexual health intervention used in this research produced differences in self-focused, compared to other-focused, sex attitudes. For example, within the HEART program, participants were consistently asked what they believed to be true regarding safe consensual practices or how this information resonated with them, focusing more on the personal experience rather than broader societal or other-focused reflections. Notably, STI-related stigma and shame are highly relational constructs, such that stigma and shame require information and influence from other people in a given sociocultural context. Research exemplified by Mujugira et al. (2021) highlights the escalating societal and healthcare-related stigma surrounding STIs, emphasizing social and institutional mechanisms that perpetuate such stigmas (Kirby, 2008; Talley, 2020). Notably, healthcare staff and clinicians are consistently identified as influential factors in the persistence of STI-related stigmas among patient populations (Talley, 2020). Additionally, the promotion of abstinence-focused sex education programs through public policies, as discussed by Kirby (2008) and Balfe et al. (2010), contributes to the stigmatization and shame experienced by individuals seeking STI testing after engaging in condom-less or pre-marital sex. Furthermore, research from multiple domains, including COVID-19 diagnosis (Li et al., 2020), mental illness (Wood et al., 2017), and abortion experiences (Røseth et al., 2022) link stigma and shame, such that experienced (and internalized) stigma leads to shame - indeed, some theorize that shame is simply a first-person experience of stigma (Scambler, 2004).

Our results factor into this theory as the HEART program successfully decreased participants' perceived STI-related shame (and internalized experience; “If I were to test positive for an STI, I would feel worried or anxious”). However, it did not significantly impact broader levels of STI stigma (external experience; “If someone has an STI, health workers would think poorly of them”). Therefore, we suggest that a possible explanation for

the lack of success in mitigating perceived STI-related stigma with the HEART program could be attributed to the presence of structural stigma surrounding STIs. As such, future research in this area should explore the differential impact of sexuality and relationships education programs on internalized experiences or things within the individuals' control (e.g., sexual self-efficacy, comfort with sexuality, and even STI shame), as opposed to relational experiences that are likely shaped by complex social or institutional factors (e.g., STI-related stigma).

5.4.1 Limitations

One limitation of this study lies within the variable of mindset (tightness-looseness). Due to the low Cronbach's alpha estimates within our sample, it is unclear whether or not this modified scale is sufficient for measuring tightness-looseness on an individual level. Future replications of this work might consider exploratory or confirmatory factor analyses to further evaluate and justify the use of this scale. Other researchers might also consider testing the predictive, construct, and convergent validity within future replications. For example, researchers could explore the scale's predictive validity by assessing its ability to accurately forecast attitudes, behaviors, or outcomes found within this work (e.g., does tightness predict greater sexual self-efficacy and lower comfort with sexuality?). We affirm that mindset varies on a micro-level (from region to region within a given country; Harrington & Gelfand, 2014) - in addition to variation measurable on more macro-levels (from country to country; Gelfand et al., 2011) - and should thus be assessed to preserve this meaningful variation.

Another limitation to highlight with regard to our measurement and conceptualization of mindset, within this sample, the mean was skewed to the right (M = 2.96, SD = .40; range 1.6 - 4.0), indicating that our population tended to be 'tighter' in nature. Research suggests that individuals in tighter cultures tend to be more religious and endorse heterosexual norms (Lopez et al., 2022), which may allude to our findings that tighter mindsets also experienced less comfort when prompted to reflect on their ability to engage with people whose sexual activities differed from their own practices (indicating deviation from normative heterosexual behaviors). Not to mention the belief that speaking about (or challenging) norms around sex and sexuality is taboo in most conservative and religious communities (Ingersoll & Cook, 2022), another probable link to why our participants experienced less comfort. Future replications of this work may benefit from purposive or targeted sampling procedures to ensure the representation of individuals with tighter and looser mindsets. Indeed, in future

samples that represent a broader range of the mindset spectrum, we would anticipate stronger effects than those identified in this report - in many cases, the lack of a main effect of mindset may be due to a restricted range.

In the sampling process, deliberate decisions were made to ensure the inclusion of non-binary participants in the study, reflecting a commitment to diversity and representation within the research. Recognizing the significance of capturing the experiences and perspectives of individuals beyond the binary gender spectrum, we aimed to foster inclusivity and provide a more comprehensive understanding of the studied phenomena. The decision to include non-binary participants is rooted in the ethical imperative of acknowledging and respecting diverse gender identities (articulated nicely by Broussard et al., 2028). It also aligns with contemporary efforts to move beyond traditional binary frameworks, fostering a more nuanced exploration of gender-related phenomena. This choice is particularly important for contributing to a body of literature that is more reflective of the richness and complexity of human experiences (critically critiqued by Klein et al., 2022 concerning sex research). However, it is essential to acknowledge certain limitations associated with the inclusion of non-binary participants. The unequal sample sizes across gender categories (61 female, 60 male, and 4 non-binary) resulted in the inability to conduct a detailed gender-based analysis due to disparities in sample sizes. Despite these limitations, the inclusion of non-binary individuals enriches the overall study, offering unique insights that contribute to a more inclusive and representative research landscape. The decision to include non-binary participants, while posing statistical challenges, aligns with our broader goals of promoting diversity and including the full spectrum of gender identities. It reflects a commitment to fostering an inclusive and equitable research environment, acknowledging the importance of every individual's voice in shaping the narrative of the study.

With respect to representation, our sample consisted of young adults living within the United Kingdom who mostly identified as heterosexual men or women. This is limiting in gaining perspectives of non-heterosexual and gender-expansive identities whose experiences with sex education have been continuously suppressed by heteronormative narratives (Agtarap & Adair, 2023). Furthermore, this research continues to represent the experiences or sexual attitudes of individuals in Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies, which have been cited to dominate the field of sex research (Klein et al., 2022). Indeed, this research does not explore how other socio-demographic factors such as

religious belief interact with mindset itself or outcomes related to sexual health (e.g., STI-stigma\shame or sex-related guilt); notably a recent study outlines that religious affiliations grow more prominently in tighter (vs. looser) cultures (Senay, 2024) – where another outlines the prevalence of societal shame of menstrual practices within religiously tighter cultures (vs. liberalized loose; Badiani et al., 2023). It is unclear to what extent our sampled population was more religious and tighter in their norm adherence and how that further adds to shifts after engaging with the online sex education program. We call for future replications of this work to be evaluated within non-WEIRD societies and for researchers to place emphasis on capturing perspectives of diverse religious beliefs and experiences outside of cis-heteronormativity and binary identities.

Lastly, the gamified sexual health training program used was originally designed and developed for American adolescents. As such, the program tends to use language geared toward teenagers (e.g., "Teens like you") and reflects on experiences (e.g., "You don't have to be 18 to purchase condoms") that are more relevant to teens. This also meant that many of the animations within the program were represented by teenage characters, which could have been off-putting to some of our participants in their mid-twenties (see Figure 1). Lastly, due to the program being created within the US, it referred to stores, health clinics, and websites that were not always relevant to a UK sample. For example, the program included places where condoms are sold, such as Target and Walmart, which simply do not exist in the UK. Another example of this is referring to healthcare centers such as Planned Parenthood, a major US reproductive clinic that is not present within the UK. This could account for the smaller effect sizes found within our study, where beta coefficients at Time 2 ranged from .18-.31 (small-medium), whereas Widman and colleagues (2020) implemented the same HEART program amongst American teenagers and reported a Cohen's d range of .23-1.27 (small-large). The current study does take into account a one-week delay test, which did reveal significant effects across time, producing beta coefficients at Time 3 ranging from .14-.39 (small-medium). Importantly, this was called upon by Widman and colleagues (2020), who only tested immediate post-test results.

Nevertheless, a gamified intervention that better represents the age-appropriate experiences and animations of characters around the same age as the participants would be more appropriate for future replications. In addition, including UK-based stores and clinics would allow participants to refer to and access information within their nation, which would

also increase relevance to the sampled population. Likewise, it would allow for further exploration of mindset across the lifespan and would open novel avenues of sexuality education when learning about changes in the body as we age (e.g., post-partum experiences and menopause); it would also allow for more in-depth conversations and educational material on sensitive issues inclusive of abortion education, gender-confirming care, and sexual dysfunction. Apart from this limitation, our study showcases the adaptability of the HEART program, which held significance when implemented amongst young adults within the United Kingdom.

5.4.2 Socio-Political Implications

When examining the implications for social policies, our research highlights two critical findings: 1) online sexuality education programming is effective at producing changes in key sexual health outcomes, including comfort with sexuality, STI-related shame, and sexual self-efficacy and 2) mindset, or variation in the extent to which one adheres to social norms, is a dimension of variability that is relevant to sexual health. For example, if we consider mindset as a factor that varies on the national level (e.g., China is a tighter country (Yan et al., 2020) while the USA is a looser country (Harrington & Gelfand, 2014)), it significantly influences the formulation and impact of social policies surrounding sex education and bodily autonomy through top-down mechanisms (i.g., policies implemented at the government level). The United States of America (USA) is a particularly good example of how cultural mindset varies at the national level, where we see looser states such as California (Harrington & Gelfand, 2014) implementing social policies that protect agency over bodily autonomy and demand comprehensive sex education in schools (SIECUS, 2023). Whereas tighter states such as Mississippi (Harrington & Gelfand, 2014) are implementing social policies that restrict access to reproductive health care (e.g., heightened abortion restrictions) and enforce an abstinence-only approach to sex education (Compton & Greer, 2022).

What our research attempts to outline within this manuscript is a deeper analysis of how mindset shapes sexual health attitudes, behaviors, and experiences on the individual level. As such, this work calls on policymakers, sex educators, and researchers to consider how sexual health curricula may be delivered as a person-centered, bottom-up approach. For example, if a cohort is particularly loose with their norm adherence, the sex educator could note the importance of focusing on self-efficacy and boundaries, as our research demonstrates

that individuals with looser mindsets tend to score lower in this domain. On the other hand, if a cohort is tighter in their norm adherence, the sex educator could focus on guilt-reducing strategies and increasing experienced comfort with sexuality. Again, this is due to our work suggesting tighter individuals tended to experience more guilt and less comfort with sexuality. Therefore, the focus shifts from a purely policy-informed approach to understanding the mindset of the individual to fit their needs better. Thus, we argue that the use of a tightness-looseness framework could inform a person-centered approach that ultimately guides more effective, individualized, and responsive curricula to the individuals participating in the sexual health training program.

Chapter 6: Concluding Remarks

The purpose of this thesis was to make a novel contribution to the field of sexual health by using concepts borrowed from cross-cultural and social psychology. Specifically, this thesis explored 1) the interconnectedness of tightness-looseness and infidelity attitudes and intentions (chapter 2), sexual health policies and regional patterns in tightness-looseness (chapter 4), and individual variation in tightness-looseness and attitudinal changes following engagement with a sexual health training program (chapter 5) and 2) provided a foundational rationale concerning the importance of sexual health research by highlighting the psychological benefits of comprehensive sex education (chapter 3).

6.1 Main Findings

The main findings of this thesis suggest that regional and individual-level patterns exist within the tightness-looseness framework, and the extent to which these patterns exist offers valuable insights into the realms of sexual attitudes and experiences related to sexual health. Chapter 2 captured patterns in infidelity attitudes and intentions wherein people with looser mindsets reported more positive attitudes towards, and stronger intentions to engage in, infidelity. Furthermore, when predicting attitudes toward infidelity, mindset consistently added significant predictive value when embedded in models containing variables traditionally used to predict sexual risk-taking (including infidelity), specifically sociosexuality and Big Five personality factors. We replicated that a looser mindset adds significant value to the overall models of personality and sociosexuality when predicting infidelity attitudes across two independent samples, but not for intentions. Findings reported in Chapter 2 are consistent with those reported in the extant literature, such that unrestricted sociosexuality (Weiser et al., 2018), lower conscientiousness (Mahambrey, 2020), and lower agreeableness (Schmitt & Buss, 2001) were associated with more positive attitudes towards infidelity. This study compared two models of infidelity: one that conceptualizes infidelity as an expression of an individual's sexual strategy (e.g., viewing infidelity as a consequence of a generally unrestricted sexual strategy) and one that conceptualizes infidelity as a consequence of someone's general willingness to break rules and adhere to social norms (i.e., reporting a tight or loose mindset). We can conclude that adding in the lens of norm adherence (i.e., mindset) for attitudes toward infidelity is not as strong of a predictor as is sociosexuality, particularly the subscale of desires, which held the greatest predictive power for attitudes and intentions toward infidelity across each sample. This work also expanded upon Harrington

and Gelfand's (2014) finding that people living in tighter US states reported higher agreeableness and conscientiousness scores compared to people living in looser states. As such, it is unsurprising that when evaluated on the individual level, those who scored high on conscientiousness and agreeableness were tighter in their mindset, an indication that they were less likely to break the rules around monogamy by demonstrating greater impulse control and self-constraint (Harrington & Gelfand, 2014) and, therefore, less likely to hold favorable attitudes towards infidelity.

In Chapter 3, in addition to mindset considerations, we delved into a comprehensive exploration of the perceived and anticipated well-being and mental health benefits associated with comprehensive sex education. The responses from our participants overwhelmingly endorsed the fundamental right to comprehensive sex education, emphasizing that such knowledge is crucial not only during the initiation of sexual activity but throughout one's lifespan. The participants viewed accurate information about relationships and understanding their bodies as a human right that should not be withheld. Importantly, our findings suggest a strong connection between a healthy and happy intimate life and an overall healthier and happier state of mind. The primary objective of the chapter was to establish a foundational rationale highlighting the far-reaching implications of comprehensive sex education implementation apart from physical health benefits, as critiqued by Goldfarb and Lieberman (2021). Chapter 3 underscored the critical importance of broadening the scope when assessing the outcomes of sex education. Indeed, focusing solely on physical health and behavioral changes overlooks a myriad of psychological and well-being outcomes associated with sex education. These insights propelled us to further examine personal and emotional experiences and attitudes toward sex education within an experimental study, providing the groundwork for the variables explored in Chapter 5.

On the regional level, and as visualized within Chapter 4, US states characterized as 'looser' tended to implement more inclusive and comprehensive sex education policies and upheld state regulations that prioritized safeguarding bodily autonomy and access to more reproductive healthcare options, compared to states characterized as 'tighter.' Exploratory analyses further confirmed these patterns by suggesting that looser states tended to implement comprehensive or abstinence-plus policies rather than abstinence-only or hold no mandate at all. These results were carried over when evaluating abortion legality throughout the US, where looser states were more likely to implement policies to protect the right to choice and

accessibility to abortion care. Specifically, we saw that looseness was significantly associated with more access to legal abortion care in more circumstances and in more gestational stages. We also saw that legal support and protections were in place for those providing (e.g., shield laws) and accessing abortion care (e.g., "buffer" zones). Previous research has reported that looseness is associated with greater openness and creativity, traits that are associated with embracing challenges to traditional social and cultural norms (Harrington & Gelfand, 2014). Thus, it is unsurprising that looser states would implement the teachings of LGBTQ-inclusive material within their sex education policies as well as be more likely to have policies in place that serve to protect the right to pro-choice decision-making and family planning strategies. The objective of this chapter was to visually depict the relationships between tightness-looseness and variables related to sexual health. Additionally, it aimed to highlight the regional (i.e., state-wide) variations in tightness-looseness within a 'looser' nation. This emphasis underscores the versatility of this construct and its applicability at different levels of analysis, including regional, state, and individual levels.

Chapter 5 further evaluated mindset as an individual-difference factor, this time by exploring changes in attitudinal shifts before and after engaging in a gamified sexual health training program. Mindset tended to produce significant effects for variables related to the self (e.g., comfort and confidence in expressing one's own sex-related desires) rather than those related to others or social norms and expectations (e.g., the extent to which one is stigmatized by society for contracting an STI). Our results suggested that both tight and loose mindsets contributed to attitudinal shifts; however, the specific attitudinal changes associated with engaging in the training program differed as a function of mindset. In particular, people who reported 'looser' mindsets also reported greater levels of comfort with sexuality and marginally less sex-related guilt. Whereas individuals who reported 'tighter' mindsets displayed marginally higher sexual self-efficacy scores. Differences in training outcomes as a function of mindset were present where 'tighter' mindsets demonstrated greater marginal shifts from the gamified sexual health training program within the variable of comfort with sexuality when compared to 'tighter' mindsets.

As the literature points out, tighter mindsets are defined by a commitment to rule-following and upholding social norms and are associated with the enforcement of severe consequences for individuals who violate or deviate from the established norms (Uz, 2014). With this in mind, it is understandable why people with a tighter mindset would also

demonstrate greater confidence in sexual self-efficacy. Sexual self-efficacy, which evaluates one's ability to communicate with their partner about condom use and boundaries, aligns with the stringent adherence to norms associated with a tighter mindset. Indeed, one's confidence in setting these sexual boundaries and ensuring these boundaries or rules for sexual contact are adhered to can be viewed as an expression of one's overall inclination to uphold social norms. Not to mention the implications of rule-breaking and risk-averse behavior, particularly concerning unprotected sexual practices. Engaging in such practices could lead to unintended pregnancies, consequently raising the likelihood of needing an abortion. As previously highlighted in this thesis (chapter 4), individuals with tighter mindsets typically endorse stricter consequences for actions of this nature. This includes the belief that abortion should not be viewed as an 'escape' from the consequences of engaging in pre-marital sex or from the perspective that sex should exclusively serve procreation purposes.

Chapter 5 aimed to contribute to the expanding body of literature that examines individual differences and educational outcomes, with a specific focus on web-based educational programs. Our findings align with broader research conducted by Buckley and Doyle (2017), Hwang et al. (2012), and Zaric et al. (2017) in the realm of individual differences and educational outcomes. Additionally, our work is situated within the context of the growing utilization of digital technologies for online health training programs, as evidenced by the studies of Widmen et al. (2020) on the HEART program, Gill et al. (2019) on postabortion care, Cupertino et al. (2019) on anti-smoking, and Kingston et al. (2017) on perinatal mental health. Chapter 5 uniquely combines these two areas - individual differences and educational outcomes, along with digital health technologies. Employing a statistical approach that analyzes the intercepts of participants rather than group means, our study provides a distinctive perspective on individual differences within a sexual health training program.

6.2 Limitations & Future Directions

Despite conscientious efforts (e.g., paying fair compensation for participant engagement, employing the advertisements across various social platforms and in-person recruitment boards, as well as using gender neutral terms throughout the advertisements and study material) to achieve inclusivity across racially, ethnically, and age-diverse populations through different platforms and survey instruments, as a whole, the demographics represented within this thesis overwhelmingly skew toward participants identifying as white, heterosexual

men and women. Although I did manage to capture responses from some gender-expansive identities (specifically within Chapters 3 and 5), these participants still represented a minority of those reached by our recruitment efforts (represented by 3% in Chapter 3 and 3.2% in Chapter 5). A review of the literature further highlights the importance of representing the voices of sexual minorities within research, provided they report more accounts of dating and sexual violence, STIs, and bullying than non-sexual minorities (Sondag et al., 2022). Indeed, such findings were echoed across three generations of people who identified as lesbian, gay, bisexual, or any other non-heterosexual identity (Bishop et al., 2021). Highlighting the voices of sexual minorities is essential to ensure a comprehensive understanding of the unique challenges and disparities they face in dating, sexual health, and interpersonal relationships are addressed. By amplifying these voices, researchers, policymakers, and educators can develop targeted interventions, inclusive educational programs, and supportive policies that address the specific needs and promote the well-being of sexual minorities, ultimately fostering a more equitable and inclusive society.

This data overwhelmingly captures behaviors, attitudes, and experiences of individuals represented within Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies, a critique and major shortcoming present in much of sex research and broader psychological research as a whole (Klein et al., 2022). Klein and colleagues (2022) capture the realities of WEIRD sex research particularly well:

> Therefore, the knowledge that has been produced is not only WEIRD and partial, but our science has also contributed to (1) erasing and silencing alternative sexual realities by generalizing findings from WEIRD samples, and (2) helping construct norms and expectations based on Western-European tradition. (p. 814)

The main objective of this thesis is to enhance our understanding of attitudes, behaviors, and experiences related to sexual health, examining both group dynamics (i.e., state-wide) and individual levels. However, relying on over-generalized findings from WEIRD populations might compromise the research's value. The adoption and adaption of a framework from cross-cultural psychology, particularly the tightness-looseness framework, aimed to contribute to a broader understanding of sexual health. The approach does not seek to silence underrepresented groups but rather intends to broaden our insights into diverse perspectives on sexual health realities. It is our contention that increased representation of non-WEIRD societies could enhance effect sizes, considering that the limited findings within mindset might be attributed to a constrained mindset range, as discussed in Chapter 5.

Future research endeavors should strive to incorporate the experiences and perspectives of individuals residing in cultural contexts that are presently underrepresented both in this study and in existing sexual health literature, as highlighted by Klein et al. (2022). For instance, when assessing items related to sexual health outcomes, such as sexual self-efficacy or condom use, the results may diverge in these underrepresented contexts due to different barriers influencing the availability of condoms (or other protective barriers) and the emotional experiences tied to them (Heslop et al., 2019). Indeed, in small rural communities, the perceived availability of protective measures and the potential for embarrassment could significantly impact an individual's reported confidence concerning such measures. This emphasizes the risk of over-generalizing certain patterns derived from the results of WEIRD contexts. Such work should be developed in coordination with the population of interest to address limitations that may arise due to the consistent lack of sexual minority representation and non-WEIRD samples. For example, a white western cis-heterosexual researcher should be co-developing the research alongside folks who identify or are part of gender-expansive communities or ethnic minorities to ensure gaps are addressed, biases are mitigated, and inclusivity is prioritized.

Another limitation of this body of work is the creation of the mindset variable, which did not continuously produce statistically sound alphas (Chapter 2, study 1: $\alpha = .53$ vs. Chapter 2, study 2: $\alpha = .65$; Chapter 5 $\alpha = .47$) or item-total correlations (see Appendixes A & C). The scale was developed by adapting one item from Gelfand and colleagues (2011) cultural level scale ("There are many social norms that people are supposed to abide by in this country") to the individual level ("I abide by the social norms that are present in the country that I currently reside in") and five items from Gelfand (2021) scale (e.g., "I stick to the rules") - for original and adapted items, see Appendix A or C. The five items selected and adapted for the research reported in this thesis were selected to closely align with items used to assess cultural variability in tightness-looseness in Gelfand and colleagues (2011) validated scale, representing an effort to comprehensively modify their validated 6-item scale to the individual level.

Indeed, and as pointed out in each discussion section throughout this thesis, future work is needed to validate the assessment of mindset on the individual level. Researchers might employ qualitative research questions to inform themes within tightness-looseness on the individual level (as described by Rowan & Wulff, 2007), providing a foundation for a theory-informed quantitative scale that might better capture norm adherence on the individual level. This research would assist in curating a mindset scale with strong validity, which could

then be used to replicate and expand upon findings present within this thesis. However, this is not to discount the work at hand as the individual mindset scale created for this research did facilitate the identification of several key predictive relationships (looseness and more positive infidelity attitudes and intentions, and experienced greater comfort with sexuality). Improvements to this scale, created using some of the strategies described above, might facilitate the identification of even stronger effects in the extent to which this improved scale captures tightness-looseness amongst individuals more precisely. Indeed, as demonstrated in Chapter 4, a scale that fully captures the variability of mindset is capable of producing incredibly strong correlations between mindset and sexual health-related policies. Furthermore, it's important to note that scales with fewer items (e.g., less than ten; Graham, 2006) tend to have lower Cronbach's alpha levels (Tavalok & Dennick, 2011) and these shorter scales still produce valid and reliable patterns of results (Graham, 2006).

Apart from the call to further validate the mindset scale on the individual level, other factors should be considered for the replication and validation of the work presented within this thesis. For example, the incorporation of contact theory into our examination of individual mindset adds a layer of complexity to the dynamics surrounding infidelity (chapter 2) and sexual health training programs (chapter 5). According to Allport (1954), contact theory suggests that direct interactions with individuals or groups holding different perspectives can lead to a reduction in prejudice (a variable frequently studied within mindset literature; see Jackson et al., 2019) and an increase in understanding. In the context of this thesis, personal experiences, such as engaging in infidelity (or being cheated on) or becoming aware of a friend's positive STI status, introduce nuanced dimensions that extend beyond the influence of mindset alone. For instance, individuals who have direct experiences with infidelity or STIs may develop intricate and context-specific perspectives that could either challenge or reinforce the mindset categories identified in this research. An example might be someone saying, "I don't stigmatize people with an STI because I or many of my friends have tested positive for an STI," suggesting that 'loose mindsets' may not be the exclusive driver of the observed relational outcomes. Another plausible avenue to explore is the susceptibility of individual-level mindset, as opposed to social or group-level mindset, to fluctuations influenced by life experiences that alter one's outlook on stigmatized topics, such as STI-related stigma and shame. More specifically, individuals who have previously tested positive for an STI - or have friends who have - might then after exhibit a 'looser' mindset when evaluating various social norms. This implies that personal experiences, especially those

related to sexual health, may play a significant role in shaping an individual's mindset, adding a layer of complexity to our understanding.

Indeed, future research should delve deeper into the interaction between contact theory and mindset, particularly in the context of sexual health outcomes. Examining how these variables intertwine can provide valuable insights into individual attitudes and behaviors towards infidelity and sex education. The intricate interplay between mindset, personal experiences, and contact theory should be thoroughly explored to unravel the complexities of how individuals shape and experience their attitudes and behaviors in the realms of sexual health research and, more broadly, sex research.

Moreover, aside from delving into personal experiences and contact theory, an examination of conformity serves to enhance our comprehension of mindset dynamics. Conformity, a psychological phenomenon where individuals adjust their behaviors or beliefs to align with group norms or expectations (Abofol et al., 2023), may operate either in conjunction with or independently of tight-loose mindsets. While tight-loose mindsets capture an individual's adherence to societal norms, conformity reflects the inclination to align with the expectations of a specific group. Notably, various researchers tend to explain and/or define tighter mindsets by using conformity as an example ("In 'tight' cultures…individuals must conform to group values" (Carpenter, 2000; p. 41)). However, it is unclear – do to a gap in the literature – to what extent conformity might differ to mindset when evaluating or processing sex-related topics. Indeed, it is crucial to note that much of the research presented in this thesis pertains to internal processes, such as attitudes and intentions towards infidelity or internalized sex-related guilt, rather than overt acts of engaging in infidelity. This distinction makes measuring the overarching theme of conformity more nuanced and complex within the context of our variables. For example, to what extent does conformity or inclinations to align with expectations of a specific group coincide with internal processes of sexual guilt or shame, or – on the other hand- to what extent does one experience more sexual shame if they believe everyone is having sex, but they are not? The parallels and distinctions between conformity and tight-loose mindsets add an additional layer of complexity to individuals' responses in the research context. Recognizing these interconnections presents a more complex perspective for future research initiatives, underscoring the importance of exploring not only mindset but also its intricate relationships with conformity, group dynamics, and societal norms.Taken together, acknowledging that personal experiences may significantly alter data dynamics – particularly around socially stigmatized variables (i.e., sexual guilt) - it becomes imperative to explore the potential

interactions between mindset, individual experiences, and contact theory. Individuals who have engaged in infidelity or have close associations with STIs may exhibit variations in their mindset responses (e.g., increased experiences with a STI test, lower STI-related stigma – accounting for more explained variance than mindset alone), potentially impacting the predictive relationships identified within the thesis (particularly throughout chapters 2, 3, and 5). This acknowledgment underscores the need for a holistic examination that encompasses not only the nuances of mindset itself but also the broader context of individuals' life experiences. By delving into the intricate interplay between mindset, personal experiences, contact theory, and conformity, future research can provide a more comprehensive understanding of the multifaceted pathways that influence attitudes and behaviors in the complex domain of sexual health.

As a whole, this thesis is an exploration of i) tight and loose social norm adherence as a key predictor of sexual attitudes and intentions toward infidelity, ii) psychological outcomes associated with sex education, iii) norm adherence and legislative patterns across sex education mandates and abortion access, and iv) norm adherence and individual outcomes related to sexual health attitudes and experiences. Other avenues for future researchers might be to change the scope from a sexual health and education lens to a topic-specific lens, such as conducting research with a specific emphasis on attitudes and experiences related to abortion or menstruation. While we find that regional patterns in tightness-looseness are associated with distinct patterns in abortion legality, it remains to be seen if - or to what extent - individual differences in tightness-looseness predict specific attitudes towards abortion. That is, future research can determine if individuals who report tighter mindsets (i.e., stricter norm adherence) are more likely to report disapproving and restrictive attitudes towards motherhood (e.g., that women should be nurturing and chaste) and abortion (e.g., that abortion access should be limited or restricted).

Now that I have gained a deeper understanding of the connections between the tightness-looseness framework and sexual health variables in my thesis, I am expanding my focus beyond the realm of sexual health to specifically explore menstrual health and education. To pursue this research direction, I employed a 5-nation study on tightness-looseness and menstrual attitudes and experiences, scheduled for analysis in the spring of 2024. This study aims to assess the prevalence of menstrual stigma and shame within a given society and its impact on individuals. The project takes a comprehensive approach to understanding menstruation, examining factors such as menstrual stigma and shame, how information about menstruation is shared within family networks, and variations in menstrual

education and knowledge acquisition across countries and individuals. This study extends the inquiries initiated in my thesis by delving into the stigma and shame associated with menstruation and by shedding light on the psychological outcomes linked to menstrual education. One of our goals is to capture and map mindset variation across the 5-nations along with the overlay of experienced menstrual stigma (i.e., does tightness correlate to increased stigma and/or shame?). Moreover, this study addresses the existing gap in non-WEIRD samples within sexual and reproductive health research.

To conclude, the work presented within this thesis leaves much room for future evaluation, validation, and replication. Much of the theoretical frameworks and models presented here are novel explorations concerning the relationship between mindset (i.e., tightness-looseness) and sexual health; indeed, we call upon researchers to further this research in a multitude of ways.

6.3 Implications, Contributions, and Advancements to Sexual Health

Evaluating and reflecting upon the implications of this body of work within the landscape of sexual health is critical for theoretical advancements in academic research and developing practical strategies to promote well-being. Here, I delve into the theoretical implications of this work, exploring how it contributes to our understanding of human experiences, informs prevention and intervention models, and sheds light on the interdisciplinary nature of sexual health. Additionally, I report on the practical implications of this work, discussing how our findings influence public health strategies by contributing to the United Nations Sustainable Development Goals. By exploring both theoretical and practical dimensions of this thesis, I aim to underscore the contributions and advancements of this work within the field of sexual health. Specifically, this thesis is presented as contributing to understanding attitudes and intentions toward infidelity, shaping the design and implementation of sexual health training programs, understanding regional patterns in sexual health legislation, and fostering a supportive and inclusive educational approach to sexual well-being.

6.3.1 Theoretical Implications

Considering the theoretical implications, a major element of this work is its contribution to a deeper understanding of human attitudes and experiences: highlighting new models and frameworks to explore attitudes and intentions related to infidelity, capturing trends in mindset and socio-political laws related to sexual health, and individual differences within a gamified training program. One example is the extended development and

evaluation of the HEART program. Unlike prior studies focusing on group means before and after the training program (Widman et al., 2020; Widman et al., 2017), this work delved into individual differences with educational outcomes. By providing insights that go beyond broader group trends, this approach advances our comprehension of human experiences in the context of individual differences and sexual health training programs. Importantly, this work builds upon the existing literature that explores the connection between individual difference factors and the seeking of sex education information from online platforms. Existing research suggests that factors such as gender (Nikkelen et al., 2019), sexual curiosity, self-esteem, and communication with friends (Bleakley et al., 2009), as well as the type of question asked (e.g., reproduction vs. sexual pleasure; McKee, 2012), significantly influenced how individuals seek information on sexual health. In this regard, Chapter 5 of this thesis makes a noteworthy contribution to the field of individual differences and sexual health.

Another example of a theoretical implication is the mapping of mindset and sexual health-related legislation within the USA. Current literature has mapped tightness-looseness across America (Harrington & Gelfand, 2014), and various non-profits have mapped regional patterns in sex education and abortion legality (SIECUS, 2023; Batha, 2023). However, to my knowledge, Chapter 4 of this thesis stands as a pioneering effort by being the first to examine the regional relationship between state-wide tightness-looseness and sexual health legislation in the USA. Through visualization and analysis, it offers a unique lens for understanding government-level decision-making (i.e., sex education mandates and abortion access) and the behaviors associated with sexual health policies (i.e., voting behaviors).

The findings presented in this thesis make significant contributions to the advancement of prevention and intervention models, facilitating the design of more informed strategies to address distinct sexual health-related issues and outcomes. The qualitative reports, which emphasize a range of psychological benefits linked to comprehensive sex education, and the identified relationship between mindset, infidelity, and sexuality education collectively offer valuable insights. These insights can inform the development and implementation of sexual health and education frameworks, enabling them to cater to the specific needs of both communities and individuals more effectively. For instance, the thematic analysis calls on future intervention frameworks to consider the well-being outcomes (e.g., reduced anxiety, stress, guilt) of sex education as well as the physical health outcomes (e.g., increased condom use and lowering STIs). It also calls on curriculum developers to prioritize both comprehensiveness (opposed to abstinence-focused) and representation of sexual and ethnic minorities in educational materials, ensuring such

information is relevant to sexual minorities (e.g., intersex and trans) and underrepresented ethnicities. Furthermore, this work explains that the tone and language in which sexual health information is delivered is crucial in relationship to stigma and shame, as most of our participants reported that their sex education was delivered as fear-based or fear-inducing. As such, future sex education design and/or implementation might work to ensure language is delivered in a supportive and open dialogue.

Our findings overwhelmingly explain that people want more from their sex education experiences and that an abstinence-focused curriculum does not meet their needs and does not appropriately equip them to create their own happy and healthy intimate lives. The evaluation and inclusion of mindset as a predictor of infidelity and sexual health education outcomes may provide insight into the creation of targeted education strategies. For example, in chapter 2 we find that people with tighter mindsets tend to report fewer positive attitudes toward (and lesser intention to engage in) infidelity and in chapter 5 we find that people with tighter mindsets tend to be better at communication around boundaries of sexual engagement and condom use but experience less comfort with their sexuality and marginally more guilt. Overall, these findings suggest that tighter mindsets may contribute to a lower inclination toward infidelity and greater adherence to communication norms around sexual boundaries and condom use. However, the observed discomfort with sexuality and slightly elevated levels of guilt among individuals with tighter mindsets indicate potential challenges in fostering a more positive sexual experience. These nuanced insights highlight the complex interplay between mindset and various facets of sexual attitudes and behaviors, emphasizing the potential for tailored approaches in sexual health interventions and education. The insights gained from these findings can be applied to prevention and intervention models my customizing educational content to suit the specific communication needs of individuals with tighter mindsets. This involves fostering an environment that enhances sexual comfort and integrating strategies to reduce guilt. Specifically, individuals with a tighter mindset would receive information tailored to diminish guilt and enhance comfort, while those with looser mindsets would be provided with information to boost sexual self-efficacy and encourage open communication around condom use. This targeted approach holds the potential to amplify the effectiveness of sexual health interventions. It ensures that interventions are not only informative but also finely attuned to the psychological nuances associated with different mindsets, thereby advancing more informed prevention and intervention models and frameworks.

Lastly, this thesis adopts an interdisciplinary approach to evaluate sexual health factors; one theoretical implication of an interdisciplinary framework is the potential to advance and integrate theories from various disciplines. Within this thesis, I employed an interdisciplinary approach to evaluate sexual health outcomes, encompassing attitudes and experiences. I conceptualized these outcomes as influenced by a range of factors, including psychological, social, cultural, and political elements. Across each chapter, I drew upon various theories (such as attachment and mindset) and disciplines (including cross-cultural and social, and political psychology) to formulate comprehensive research questions that surpassed individual disciplinary boundaries, fostering a more holistic understanding of sexual health. For instance, Chapter 4 delves into political factors and cultural trends, integrating the disciplines of political psychology and cross-cultural psychology. This approach contributes to the development of more intricate models that account for the relationship between psychological, political, and socio-cultural factors shaping sexual attitudes and outcomes across the US in relation to sex education and abortion access. Likewise, Chapter 5 integrates various educational frameworks, adapts measures from cultural psychology, and evaluates individual differences. It synthesizes disciplines such as educational research, individual factor outcomes, and sex education. By promoting an interdisciplinary landscape, this thesis not only contributes to but also advances the field of sexual health, laying a richer foundation for research and interventions in sexual health. Future researchers can build upon this groundwork by exploring the nuanced connections between psychological, cultural, and educational factors, fostering a more comprehensive understanding of sexual health. This interdisciplinary approach paves the way for innovative interventions that consider the complexity of human experiences and contribute to the continual evolution of sexual health research and practices. Ultimately, it acknowledges that a singular disciplinary perspective may not capture the complexity of sexual health and emphasizes the importance of collaboration and synthesis across disciplines to advance our theoretical understanding.

6.3.2 Practical Implications

In consideration of practical implications, a major component of this thesis is its contribution towards public health strategies and health promotion. Indeed, our empirical findings have several practical implications (see sections 3.3.5, 4.5, 5.1.4) for the public health sector. To illustrate this, we'll explore how the research outlined within this thesis aligns with several United Nations Sustainable Development Goals (SDGs):

1. *SDG 3: Good Health and Well-being*
    a. Chapter 3 delves into the importance of comprehensive sex education for preventing sexually transmitted infections, reducing unintended pregnancies, and the positive psychological outcomes attained from guilt-free and shame-free sex education. Overall, research in this area has tended to emphasize the physical health outcomes associated with comprehensive sex education (e.g., increased condom use, lowering STIs, and fewer unintended pregnancies; Goldfarb & Lieberman, 2021), and our work builds on a small, but growing, body of work highlighting the psychological health outcomes associated with comprehensive sex education (e.g., emotional well-being; Proulx et al., 2019). Incorporating material that can facilitate these psychological wellness outcomes (e.g., broader representation of gender and sexual identities, myth-busting, confident decision-making skills), future sex education policymakers and educators can contribute directly to the goal of ensuring good health and well-being.
2. *SDG 4: Quality Education:*
    a. Chapter 3 further highlights the importance of quality education by underscoring the detrimental impact of poor sex education, both physically and emotionally. Our participants explained that their sex education experience did not meet their expectations and only left them with more questions and greater levels of anxiety and fear. This is consistent with recent research, which finds that people who participate in traditional abstinence-focused education describe the curricula as fear and shame-inducing (Hoefer & Hoefer, 2017). Based on these findings, we can conclude that quality sex education should include a positive representation of relationships (including sexual pleasure) and conversations around emotional safety, confidence, and emotional empowerment. Chapter 5 provided insight into educational outcomes for people with differing mindsets; specifically, it demonstrated how people who more tightly adhere to social norms and expectations might be more prone to experience sex-related guilt. Based on these findings, we can conclude that the quality of sex education might be improved in the extent to which curricula adapt different approaches to meet the

psychological needs of the people accessing these programs. In sum, this thesis highlights avenues for the development of tailored sex education programs, ensuring they are evidence-based, culturally sensitive, and promote healthy attitudes and behaviors, contributing to the goal of quality education.

3. *SDG 5: Gender Equality & SDG 10: Reducing Inequalities*
    a. The research in this thesis addresses gender disparities and broader inequalities in the evaluation of comprehensive sex education (discussed in Chapter 3). This chapter emphasizes the negative impacts of curricula that treat contraceptives as a female issue, reinforce heteronormative narratives, and dismiss non-binary experiences, all contributing to increased inequalities. Similarly, our work explores social policies regulating sexual healthcare education and access (discussed in Chapter 4). In situations where people face restricted access to reproductive freedom, only those who can afford to travel to other states are able to pursue a legal abortion, creating wealth inequalities that disproportionately affect marginalized communities (Altındağ & Joyce, 2022). Such policies foster unequal opportunities for reproductive freedom and choice. Ultimately, we claim that promoting sexual and reproductive rights is crucial for empowering individuals to make informed choices, fostering equality, and reducing inequalities. This argument aligns with broader literature indicating that comprehensive sex education creates a safer and more equitable environment for LGBTQ+ individuals (Sondag et al., 2022), who are more likely to experience sexual harassment, forced intercourse, HIV, and bullying compared to their cis-heterosexual peers. Moreover, our arguments find support in discussions about social policies and abortion access. Fuentes (2023) highlights how restrictions on abortion care further perpetuate systemic inequality for individuals seeking safe, quality healthcare. Thus, access to reproductive freedom becomes a key factor in challenging systemic injustices for all.

To sum up, an essential implication of sexual health research is its critical contribution to public health strategies as it directly relates to advancing multiple Sustainable Development

Goals. Specifically, adding to the body of sexual health research and applying these findings to sexual health policy design/implementation and sexual health education can facilitate the overall well-being of individuals, support quality education, promote gender equality, and reduce inequalities.

6.4 Conclusion

This thesis demonstrated the relationship between mindset (i.e., tightness-looseness) and sexual health by expanding findings on the regional level and further evaluating trends on the individual level. We can conclude that mindset is an important factor to consider both regionally and individually, as such patterns and trends in mindset provide insight into the relationship between culture and politics (e.g., policies and legislation), particularly around sexual health, as well as an individual's intentions and attitudes toward infidelity and attitudinal shifts within sexual health training programs. Overall, we find that tightness (greater norm adherence and rule following) is associated with stricter relationship fidelity, abstinence-focused sex education policies, greater state-wide restrictions on abortion access, and greater reports of sexual self-efficacy. Whereas looseness (less norm adherence and rule-breaking) is associated with more positive attitudes and greater intentions toward infidelity, more likely to implement comprehensive or abstinence-plus policies, have state-wide protections in place for abortion care, and experience more comfort with sexuality and marginally less sex-related guilt. Moreover, this thesis provides a mixed-methods (qualitative and quantitative) report on the importance of sex research. Our discussion closed this thesis by highlighting a broad range of theoretical and practical implications, contributions to the field, and directions for future researchers. As abortion rights and the rights of individuals with gender-expansive identities become increasingly politically polarized and restricted (e.g., overturn of Roe v. Wade, LGBTQ+ book ban, Florida's 'don't say gay' bill), such research evaluating political trends and receptivity towards education is of great importance. In conclusion, I am hopeful that my research exploring the psychological predictors of sexual risk-taking (including individual tightness-looseness; chapter 2), the psychological outcomes of comprehensive sex education (including increased sexual self-efficacy and stigma reduction; chapters 3 and 5), and the relationship between culture (tightness-looseness) and sexual health policy (chapter 4) will contribute to promoting a more informed and inclusive approach to sexuality and sexual health in today's world.

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Appendix A

Table 1. Measuring Mindset: Original & Modified Questionnaire

Item number	Item description:	M		SD		Item-total correlations	
		Study 1	*Study 2*	*Study 1*	*Study 2*	*Study 1*	*Study 2*
1	There are many social norms that people are supposed to abide by in this country. *I abide by the social norms that are present in the country that I currently reside in.*	4.5	4.8	1.32	1.01	.58***	.69***
2	In this country, there are very clear expectations for how people should act in most situations. *I reflect on things before acting.*	4.8	4.8	0.93	1.01	.63***	.70***
3	People agree upon what behaviors are appropriate versus inappropriate in most situations in this country. *I keep my emotions under control.*	4.3	4.4	1.15	1.14	.53***	..73***
4	People in this country have a great deal of freedom in deciding how they want to behave in most situations. (R) *I stick to the rules.*	4.4	4.7	1.26	1.03	.69***	.68***
5	In this country, if someone acts in an inappropriate way, others will strongly disapprove. *I talk even when I know I shouldn't. (R)*	3.5	3.9	1.30	1.36	.48***	.53***

6	People in this country almost always comply with social norms. *In social situations, I have the ability to alter my behavior if I feel that something else is called for.*	4.7	4.5	0.84	0.99	.35***	.33***

Italicized represents items used. Item 1 from Gelfand et al. (2011) – direct modification. Items 2-6 were drawn from Gelfand's (2021) Mindset Quiz and paired in an attempt to match Gelfand's (2011) validated scale.
R indicates reverse coded item.
p < .001 indicated by ***

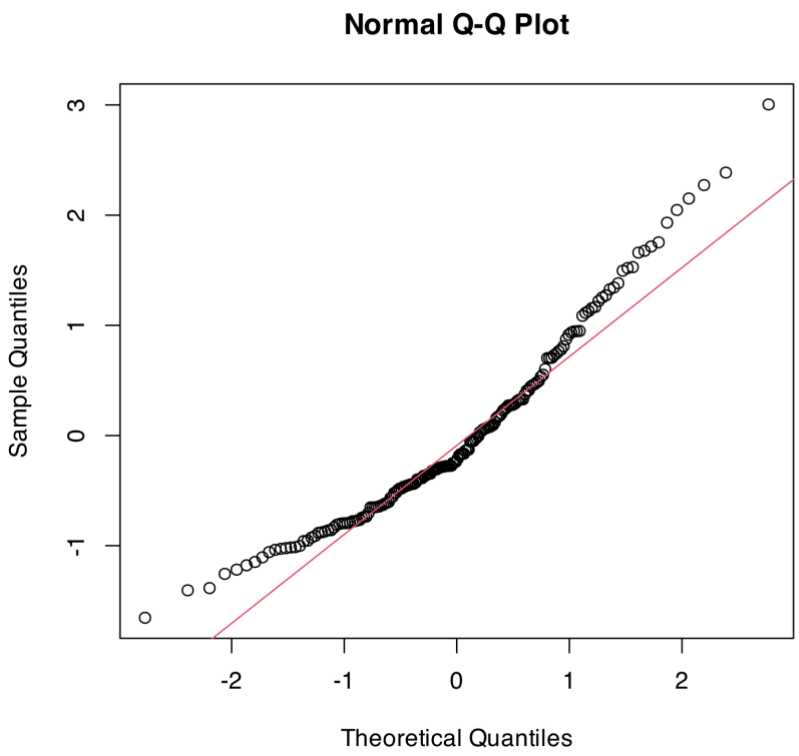
Table 2. *CFA Factor Loadings*

Factor	Indicator	Estimate	SE	Z	p
		Study 1			
Factor 1	Item 1	.733	.112	6.534	<.001
	Item 2	.346	.087	3.978	<.001
	Item 3	.215	.114	1.883	.060
	Item 4	1.10	.154	7.090	<.001
	Item 5R	.200	.114	1.755	.079
	Item 6	.100	.076	1.287	.198
		Study 2			
Factor 1	Item 1	.737	.076	9.738	<.001
	Item 2	.623	.079	7.939	<.001
	Item 3	.599	.092	6.490	<.001
	Item 4	.756	.077	9.822	<.001
	Item 5R	.391	.113	3.451	<.001
	Item 6	.120	.084	1.432	.152

Assumption Checks: Study 1

QQ-Plots of Residuals:

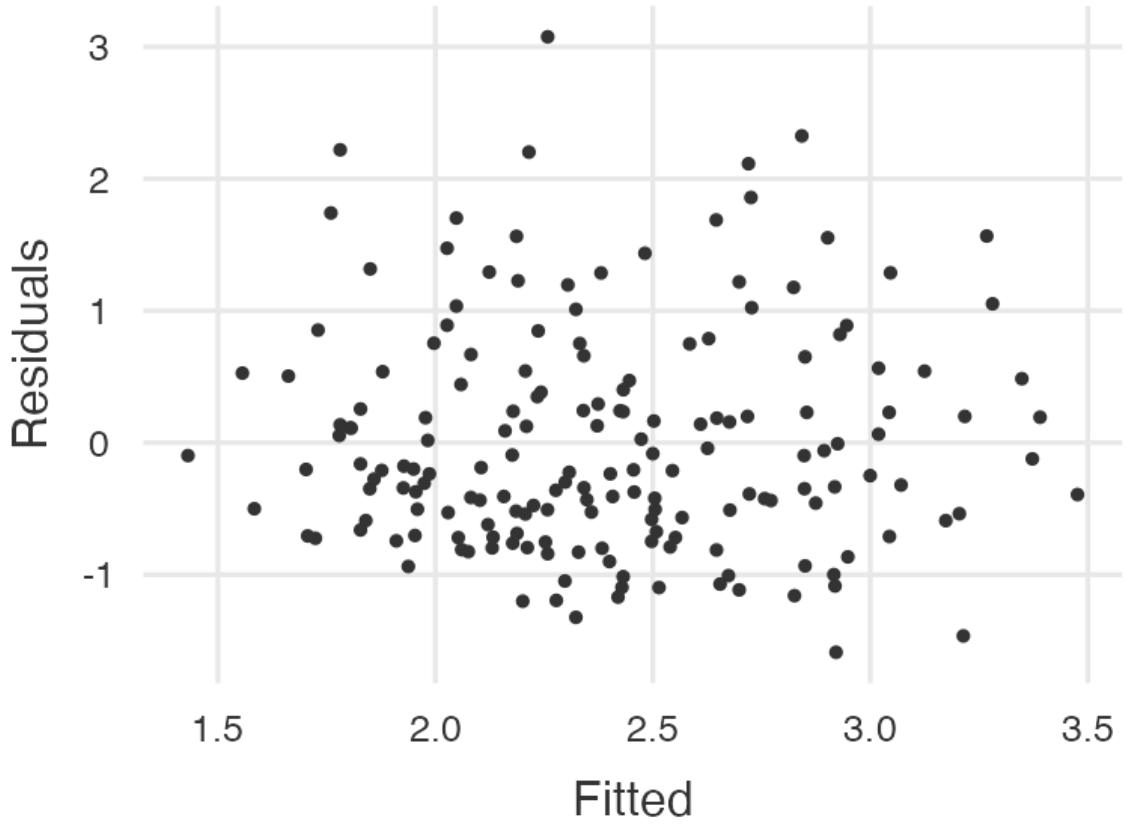
Infidelity Attitudes X Personality



Collinearity Statistics

	VIF	Tolerance
AgeGrouped	1.034	0.967
Nation	1.035	0.967
Gender	1.024	0.976
Conscientiousness	1.102	0.908
MindsetScale	1.064	0.940

Residual Plots for linearity of the Data: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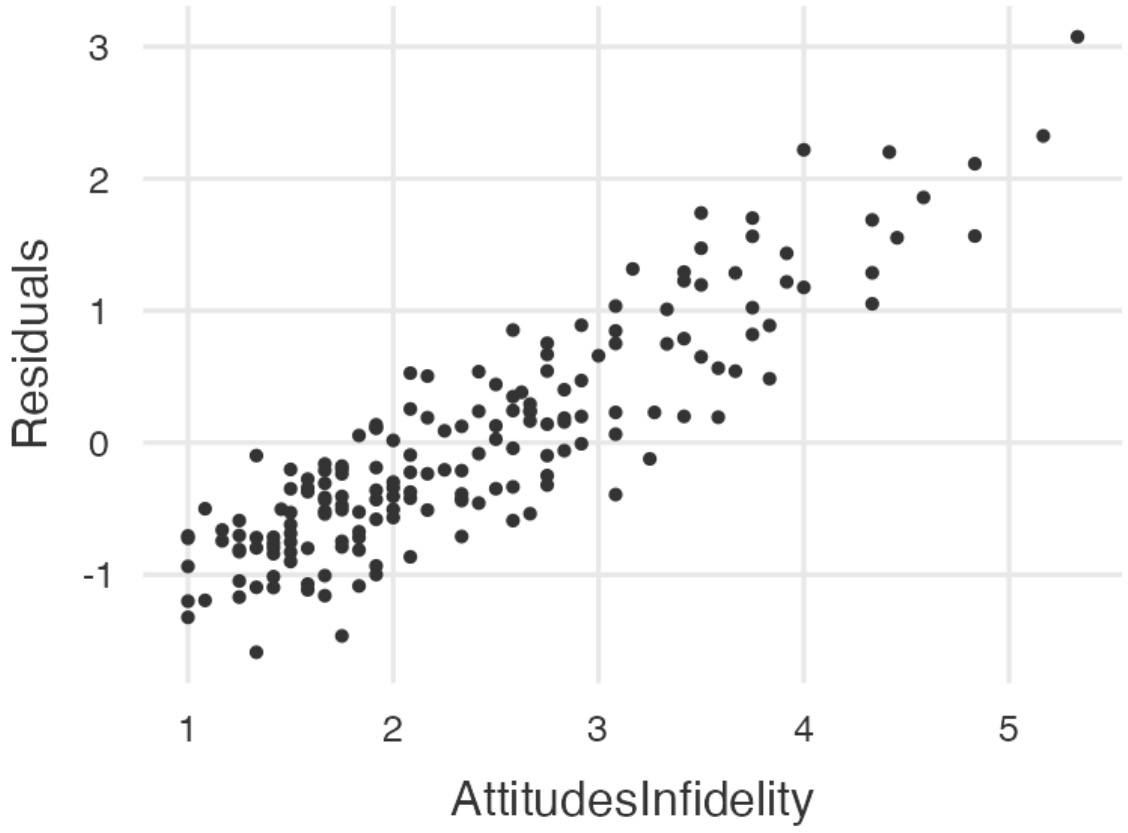
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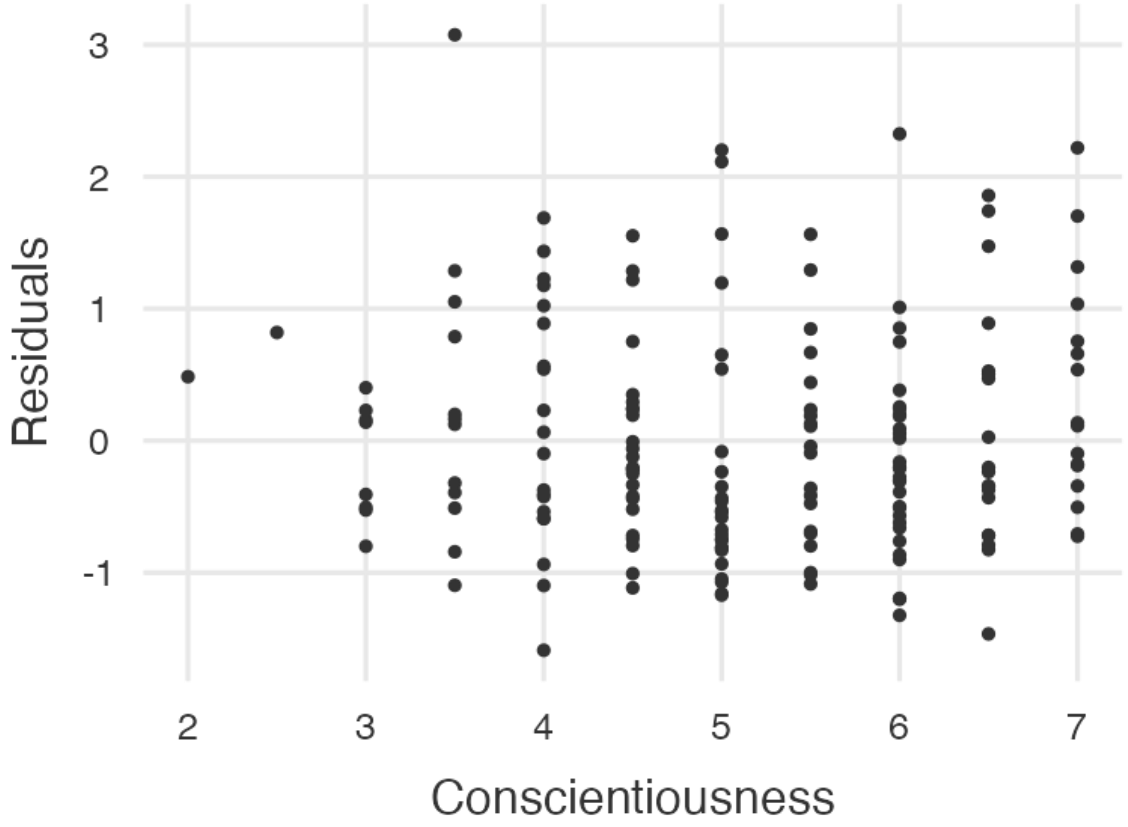
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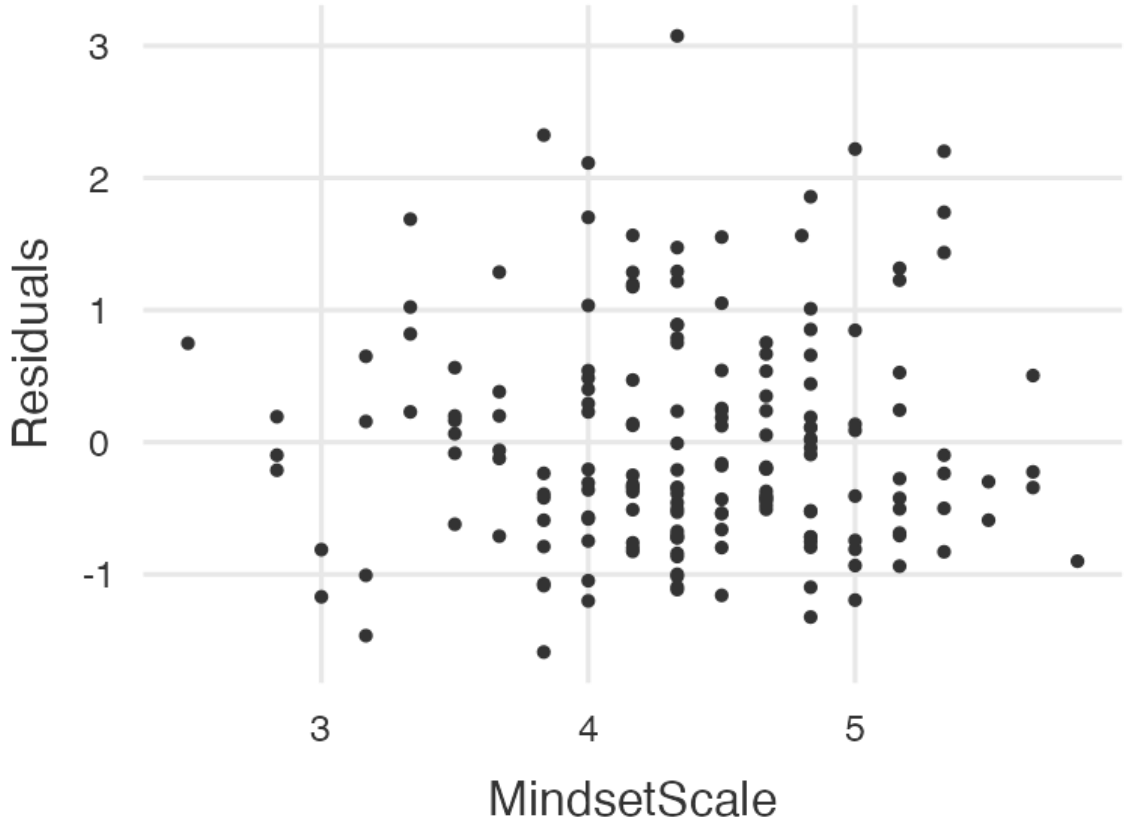
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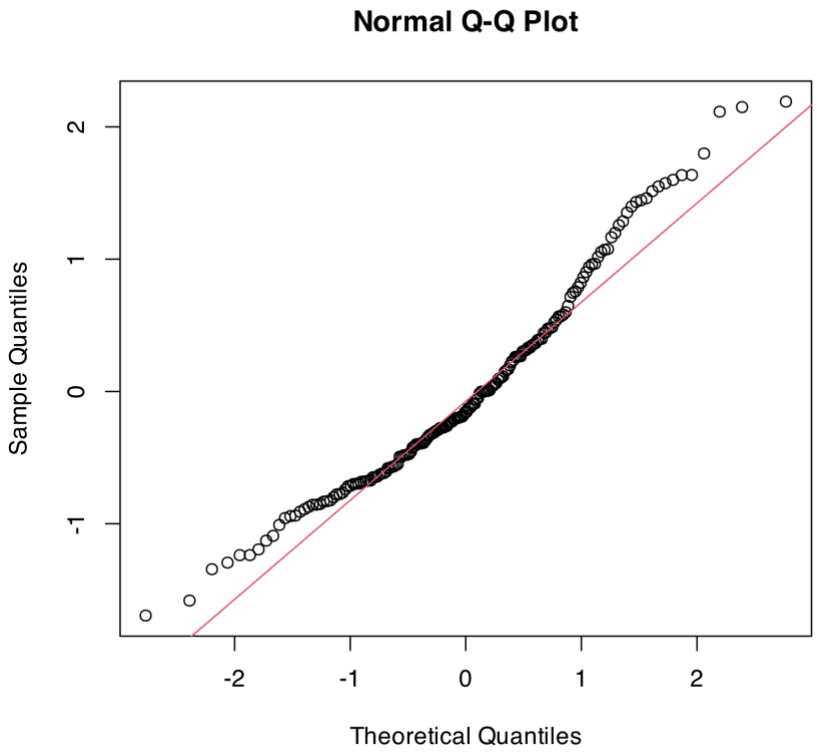
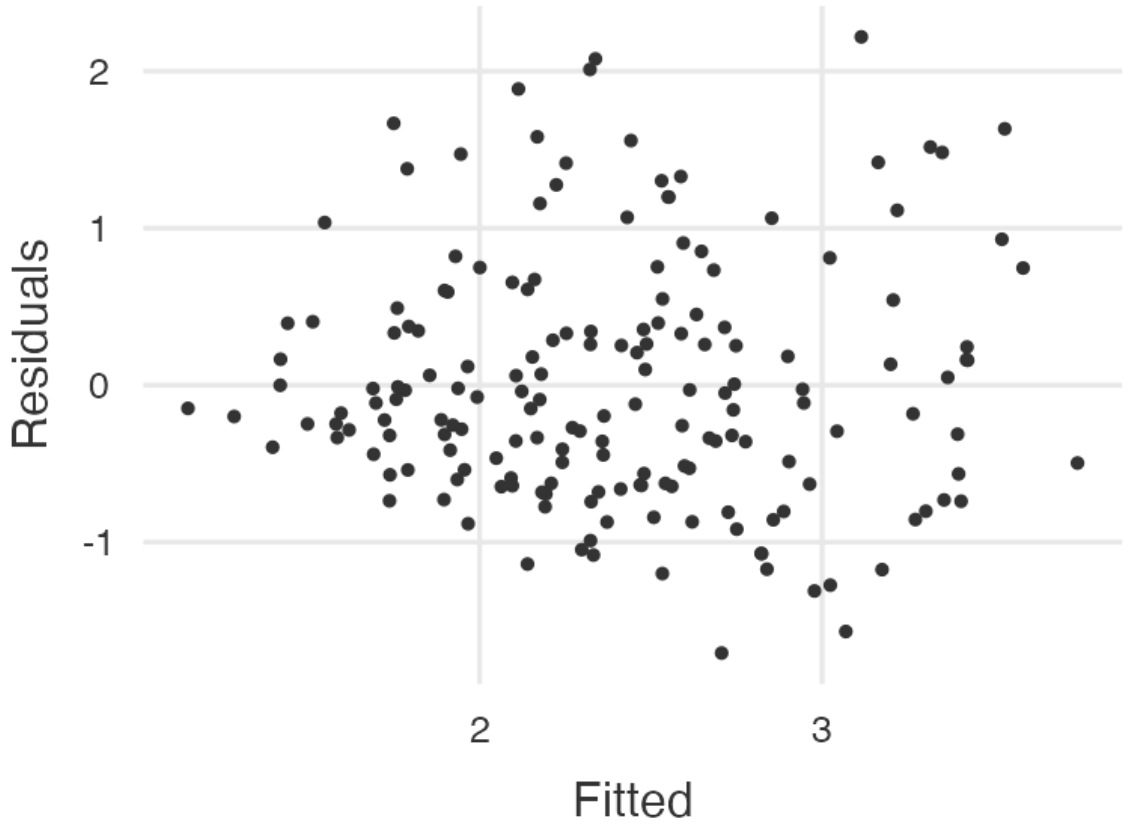
MindsetScale

Infidelity Attitudes X SOI



Collinearity Statistics

	VIF	Tolerance
AgeGrouped	1.041	0.960
Nation	1.059	0.945
Gender	1.072	0.933
SOI_Bx	1.246	0.803
SOI_Att	1.282	0.780
SOI_Des	1.237	0.808
MindsetScale	1.038	0.964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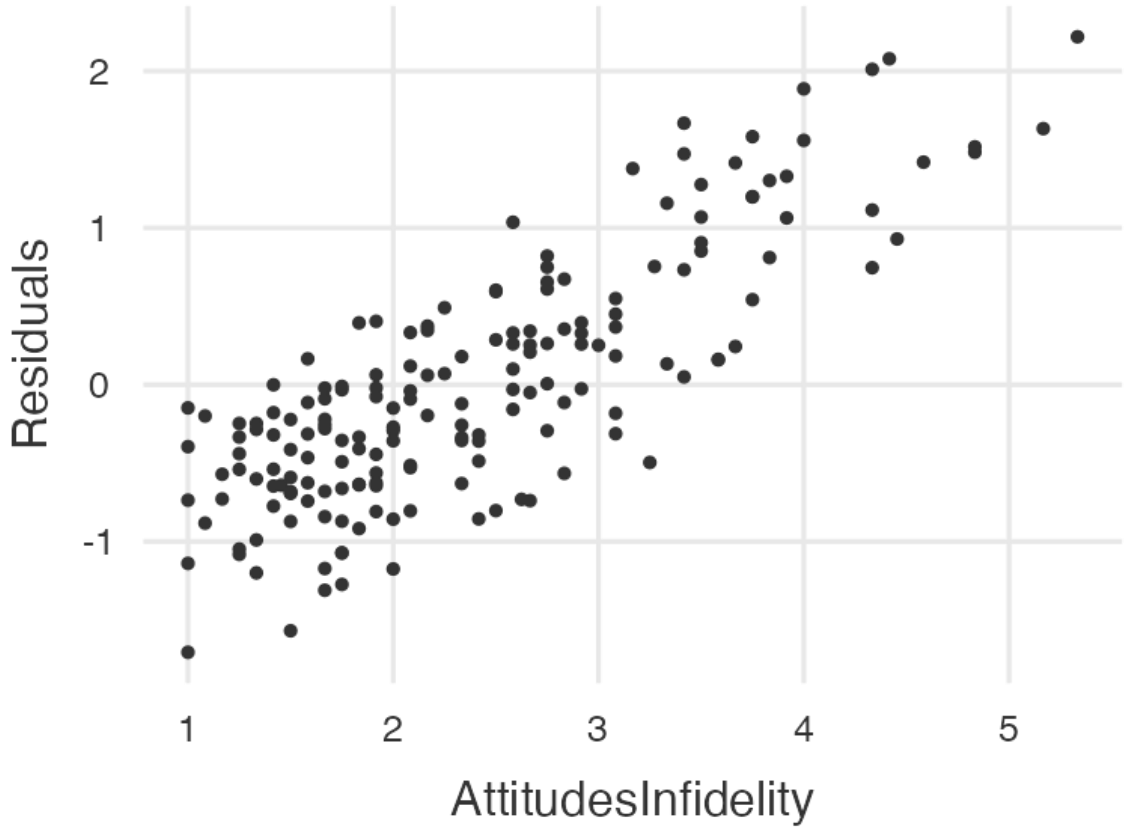
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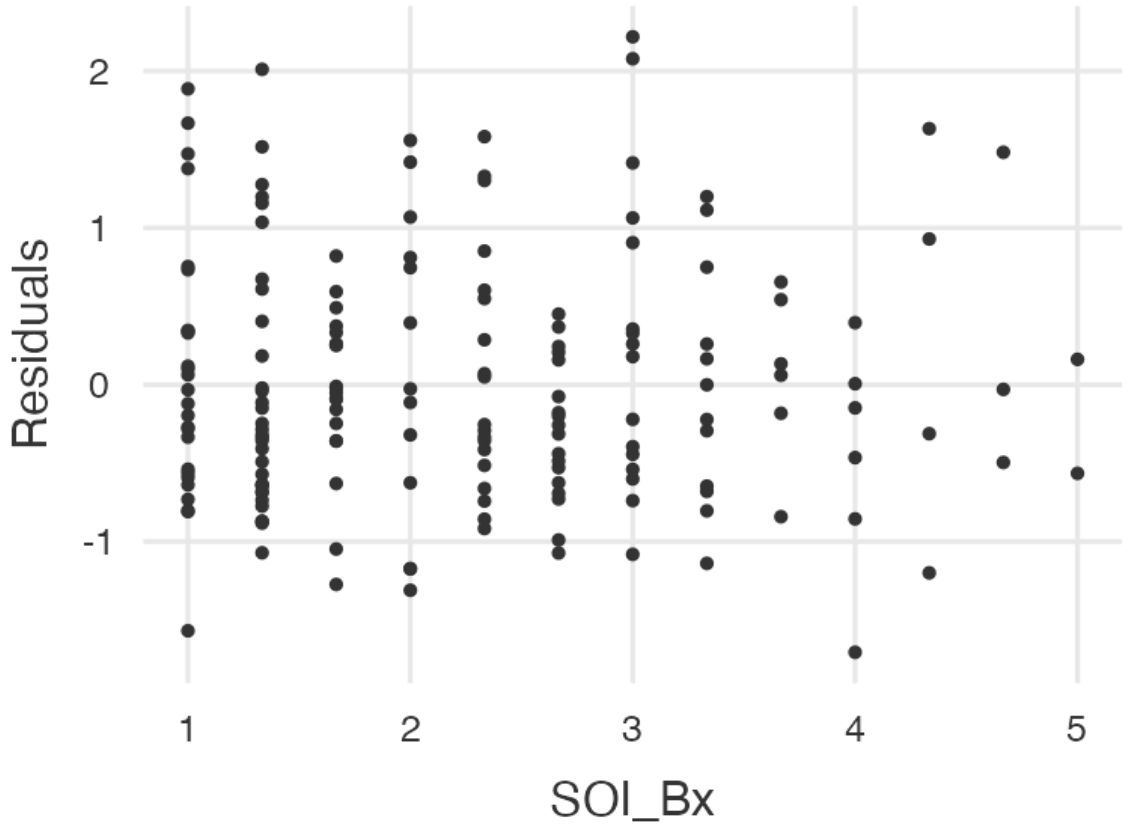
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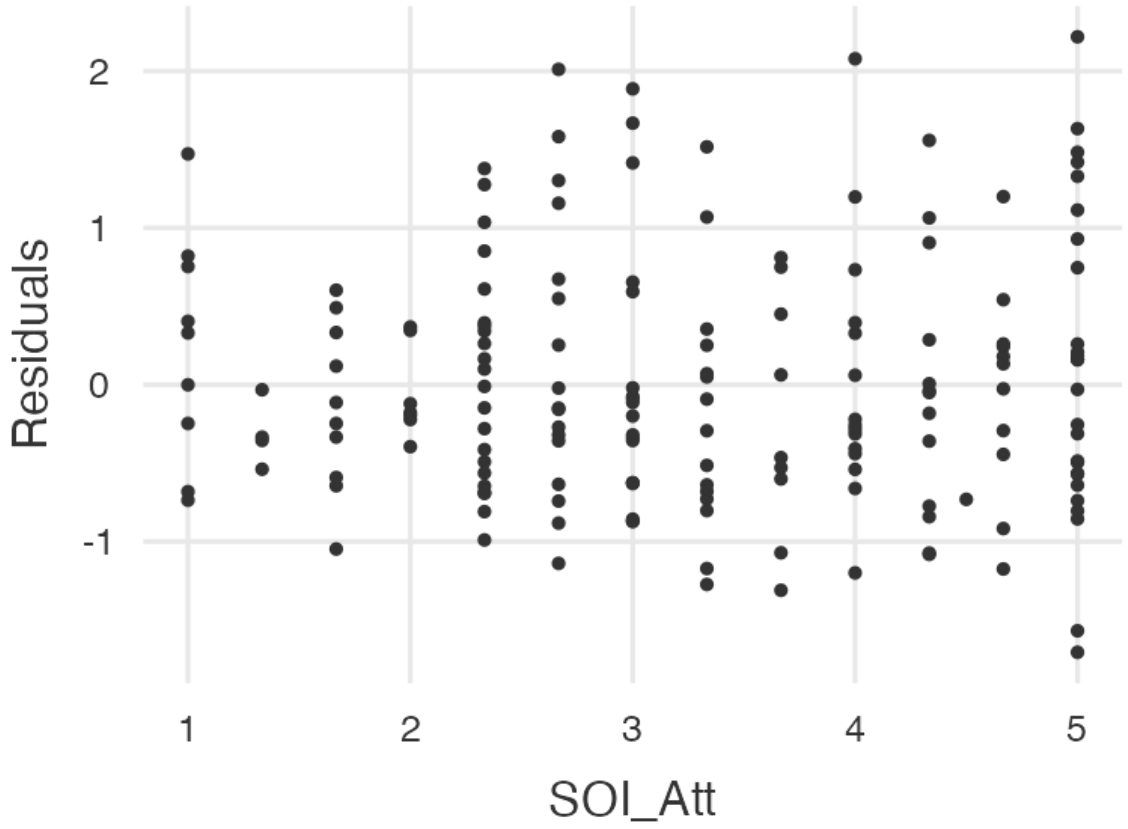
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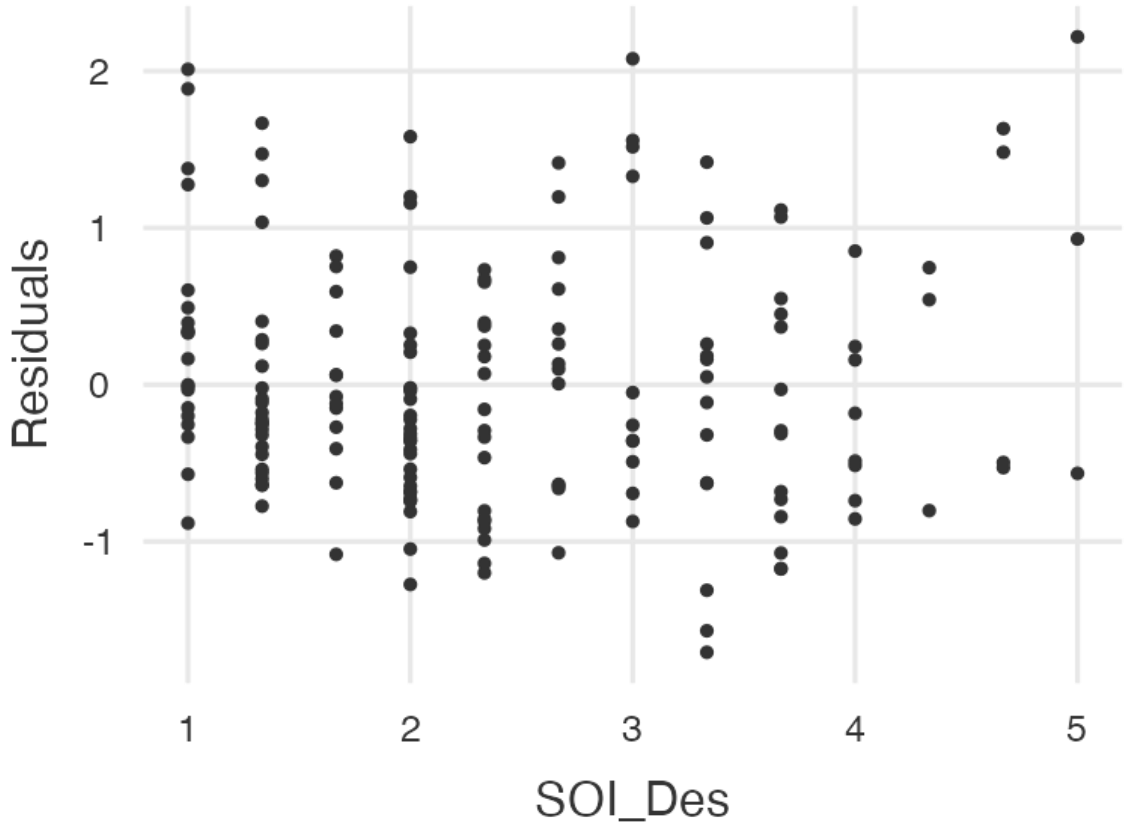
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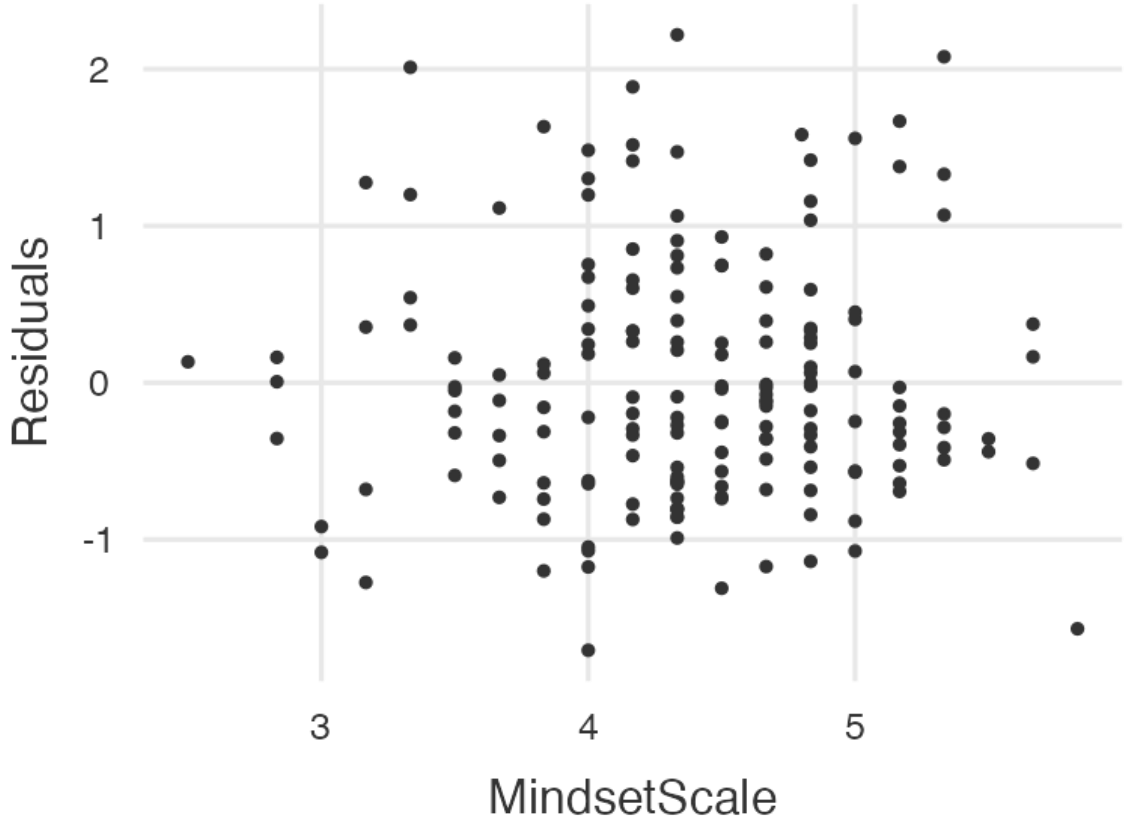
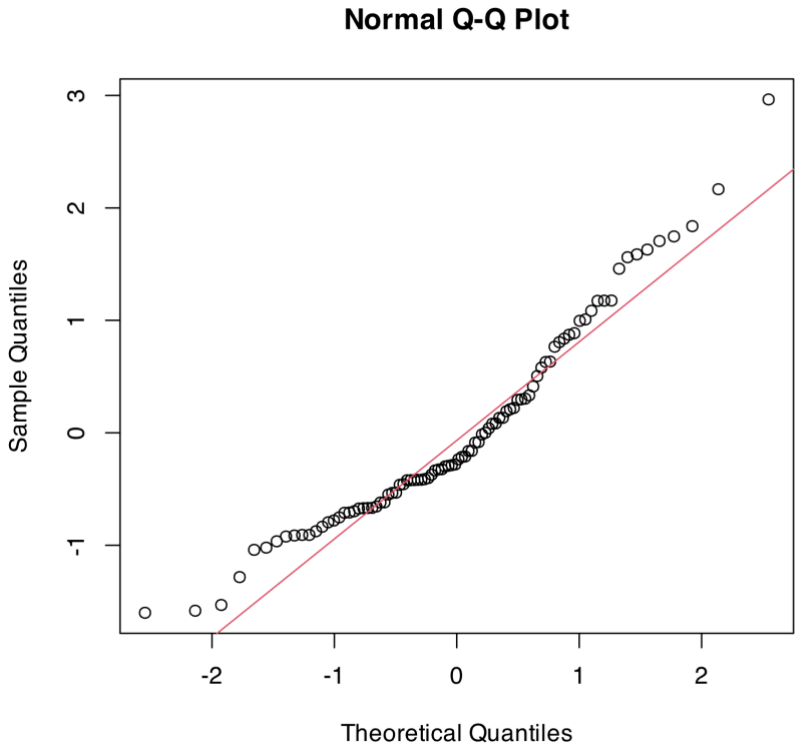


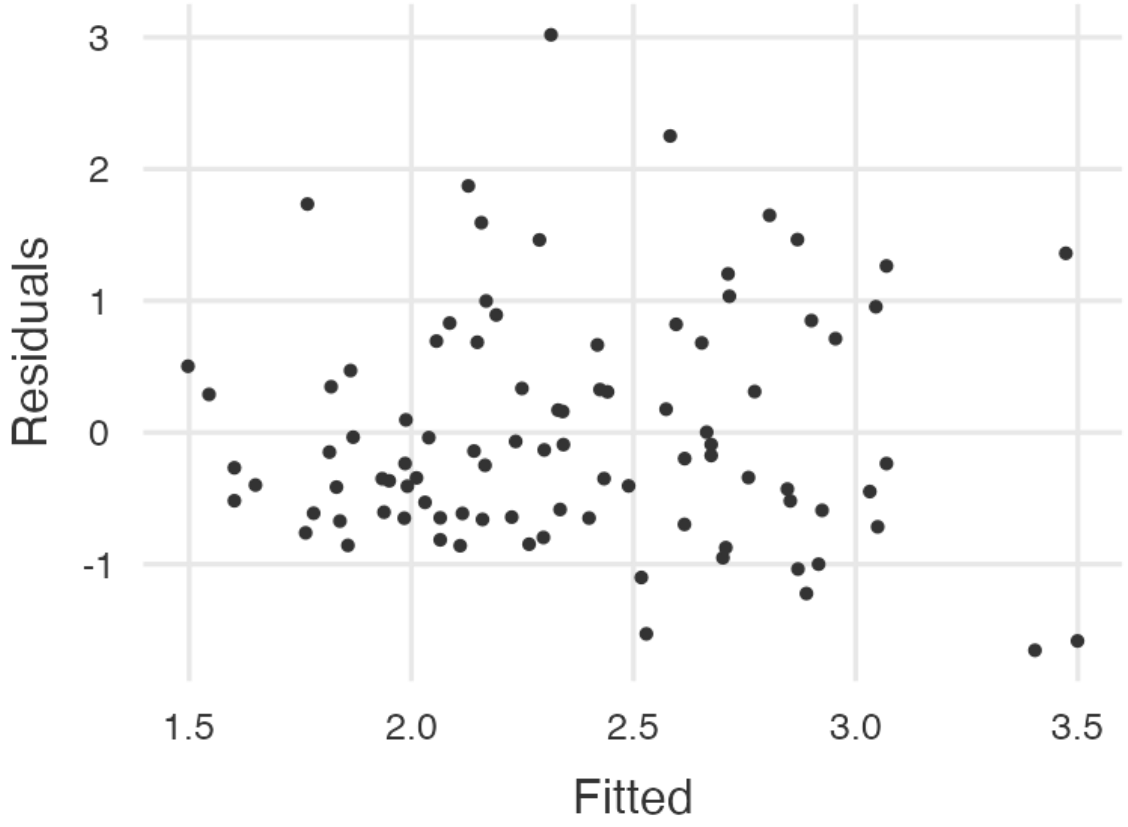
Infidelity Attitudes X Attachment

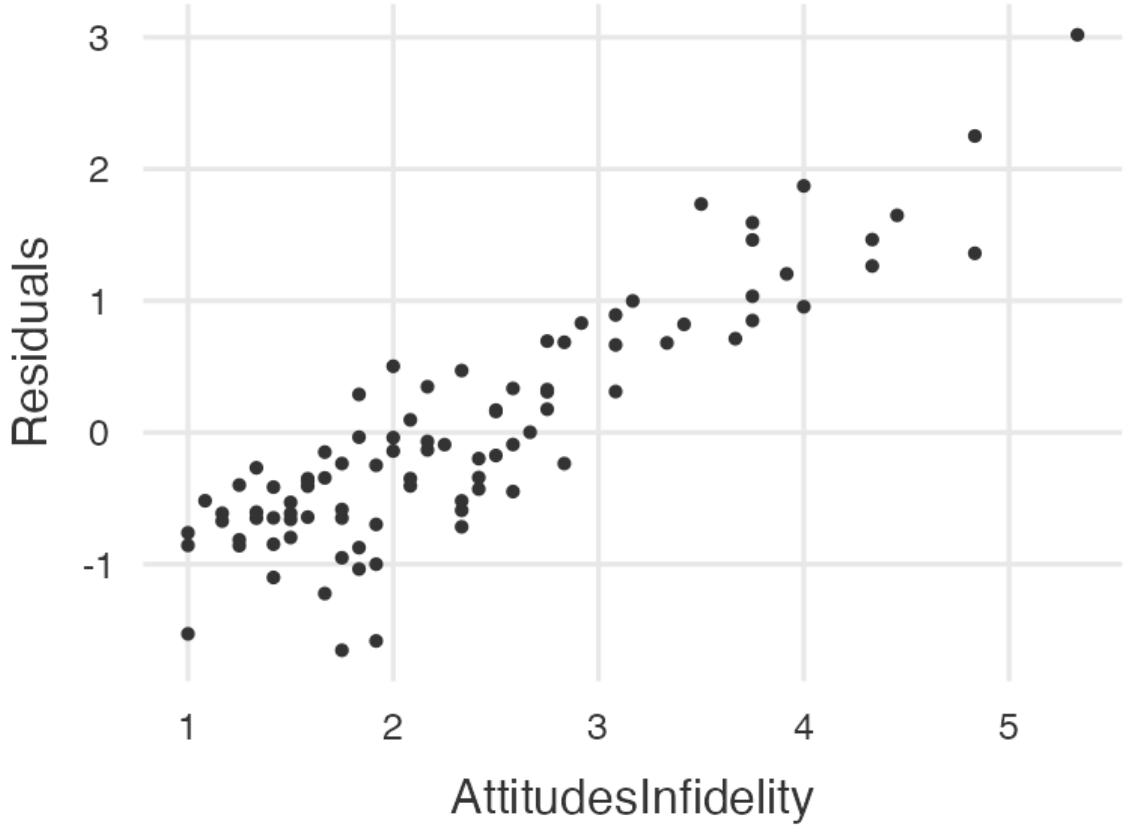


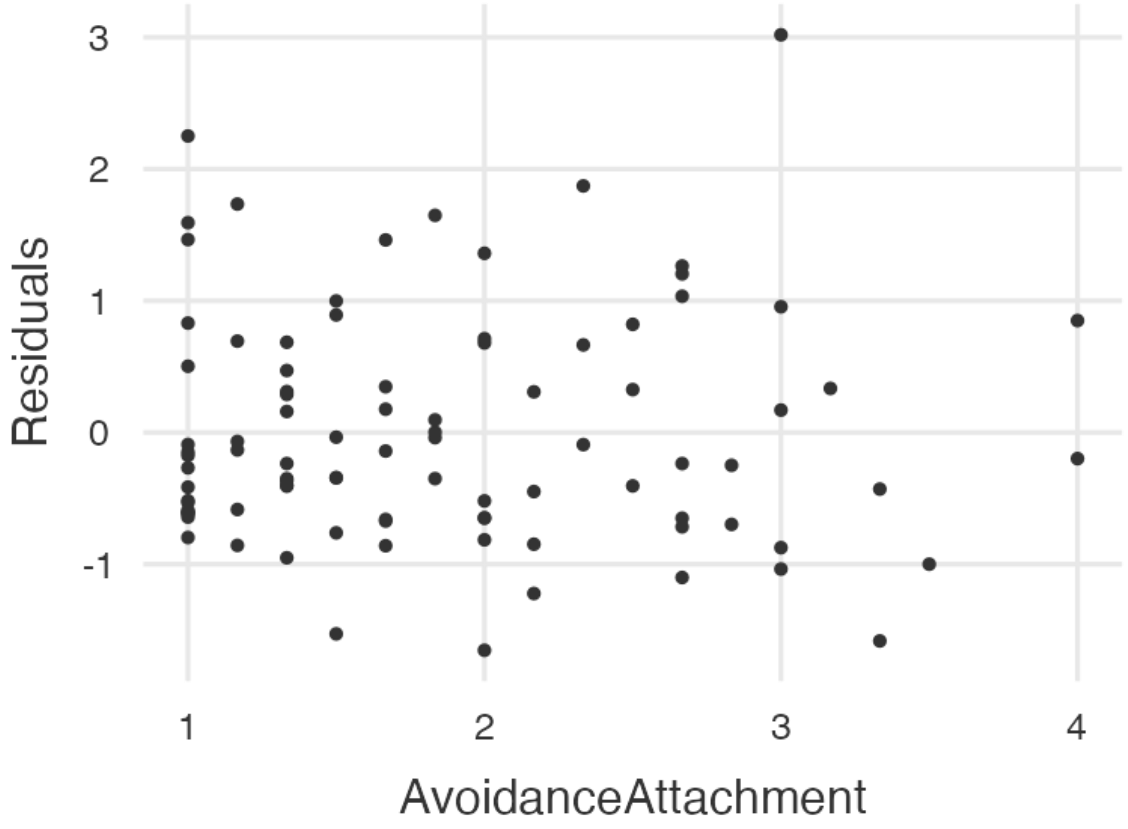
Collinearity Statistics

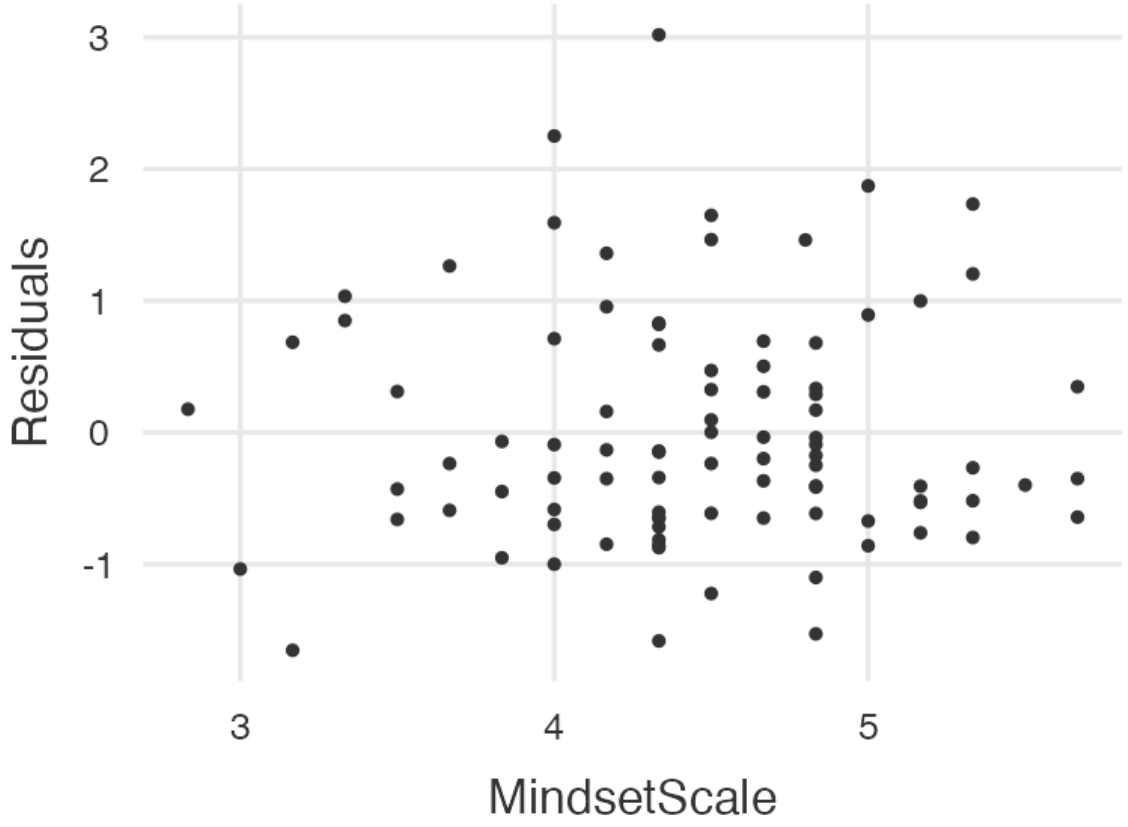
	VIF	Tolerance
AgeGrouped	1.025	0.975
Nation	1.026	0.975
Gender	1.022	0.979
AvoidanceAttachment	1.056	0.947
MindsetScale	1.061	0.943

Residuals plots of linearity of the data

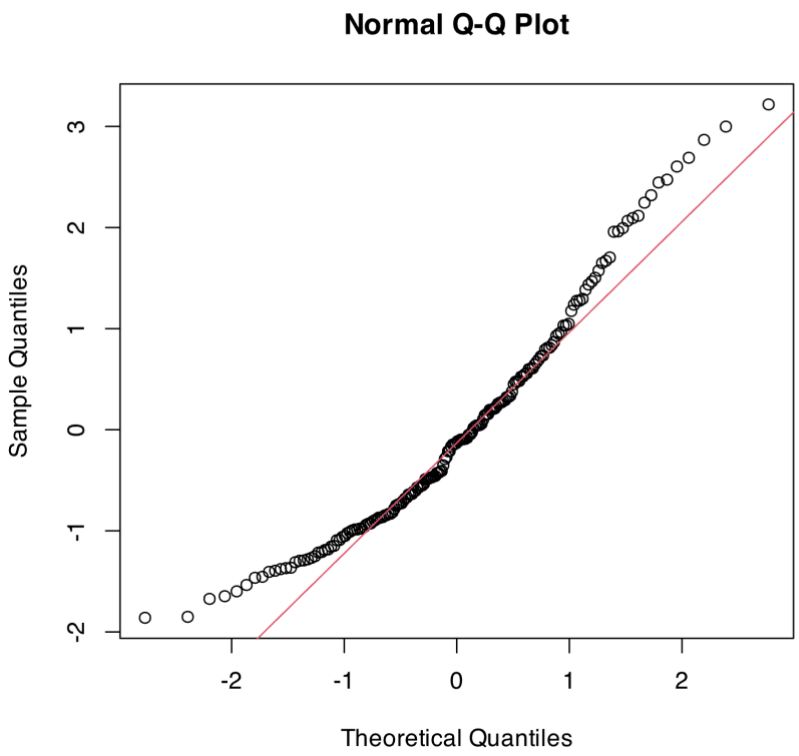



Residuals
3
2
1
0
-1
1
2
3
4
5
AttitudesInfidelity


Residuals
3
2
1
0
-1
1
2
3
4
AvoidanceAttachment



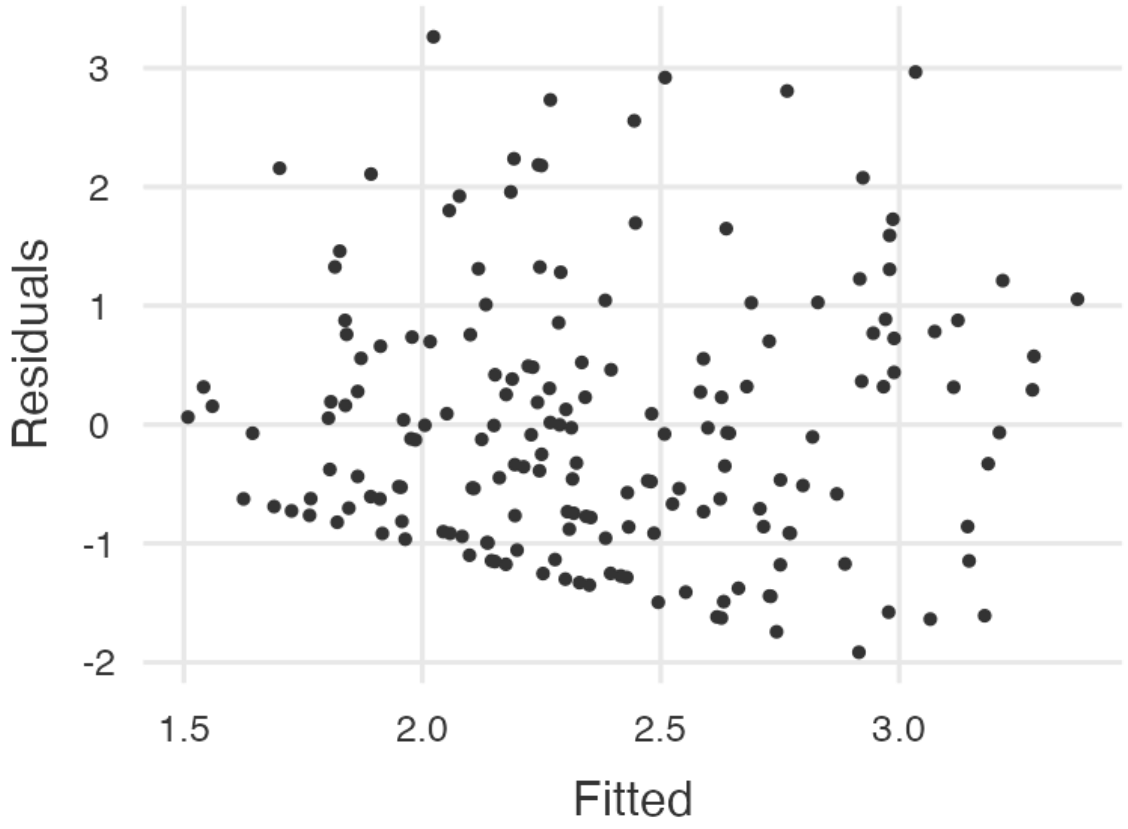
Infidelity Intentions X Personality



Collinearity Statistics

	VIF	Tolerance
AgeGrouped	1.038	0.964
Nation	1.046	0.956
Gender	1.025	0.975
Conscientiousness	1.102	0.908
Agreeableness	1.045	0.957
MindsetScale	1.077	0.928

Residual Plots for linearity of the data


Residuals
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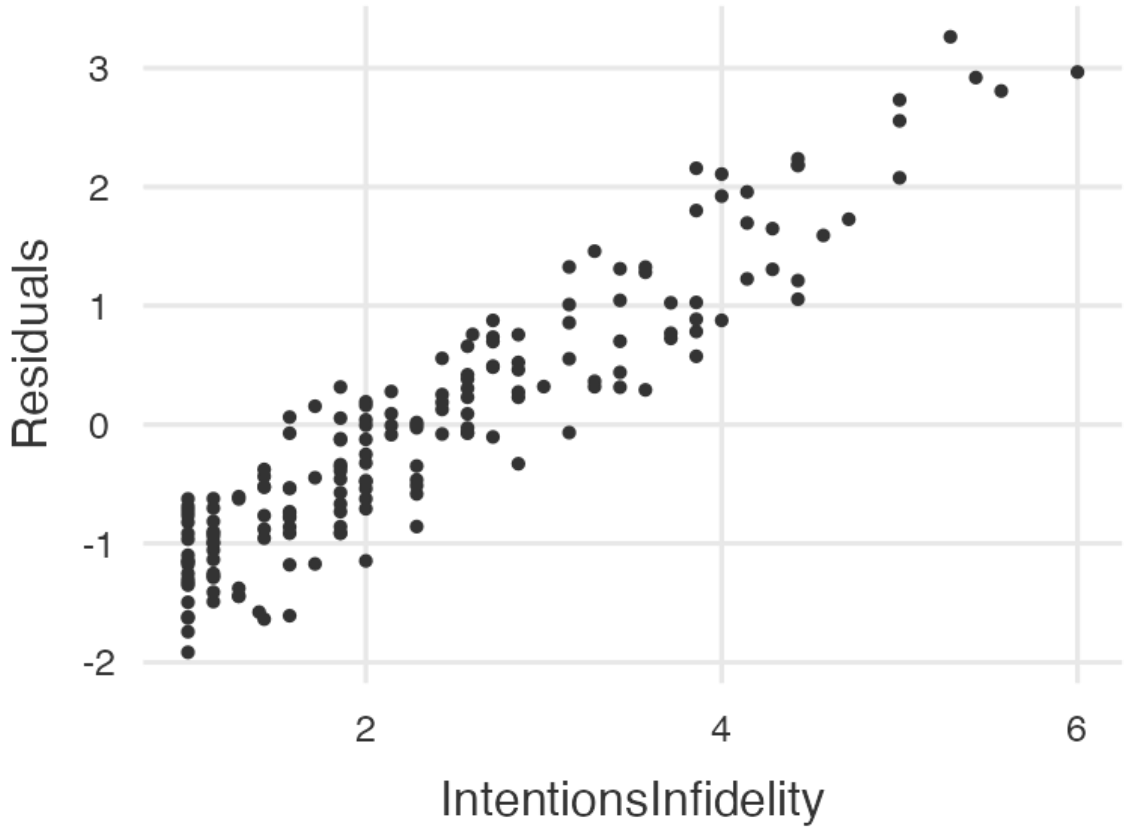
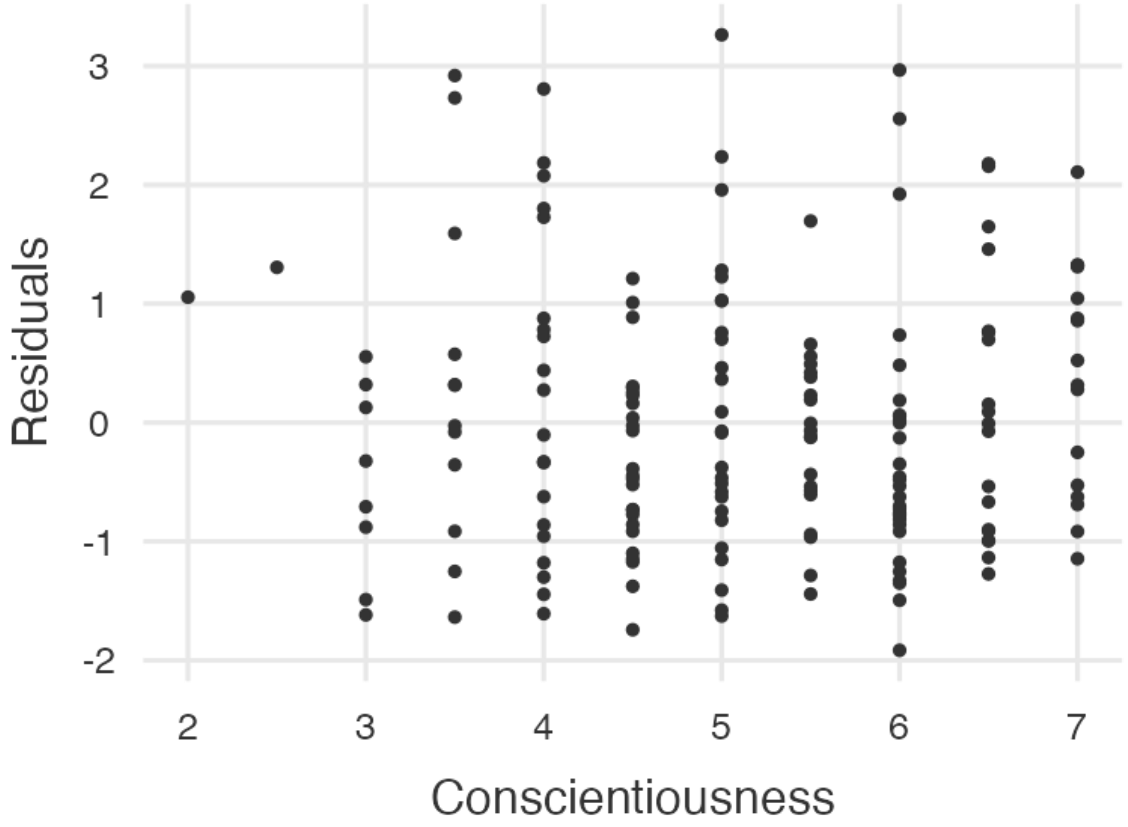
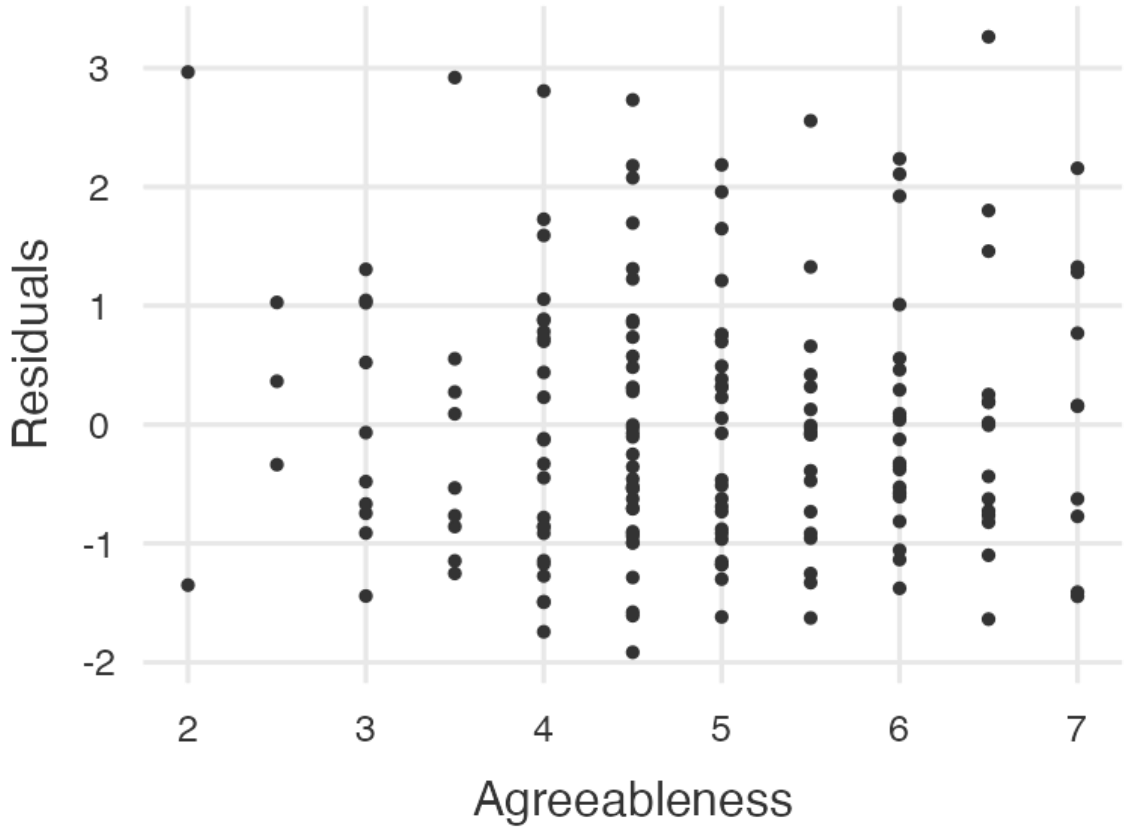
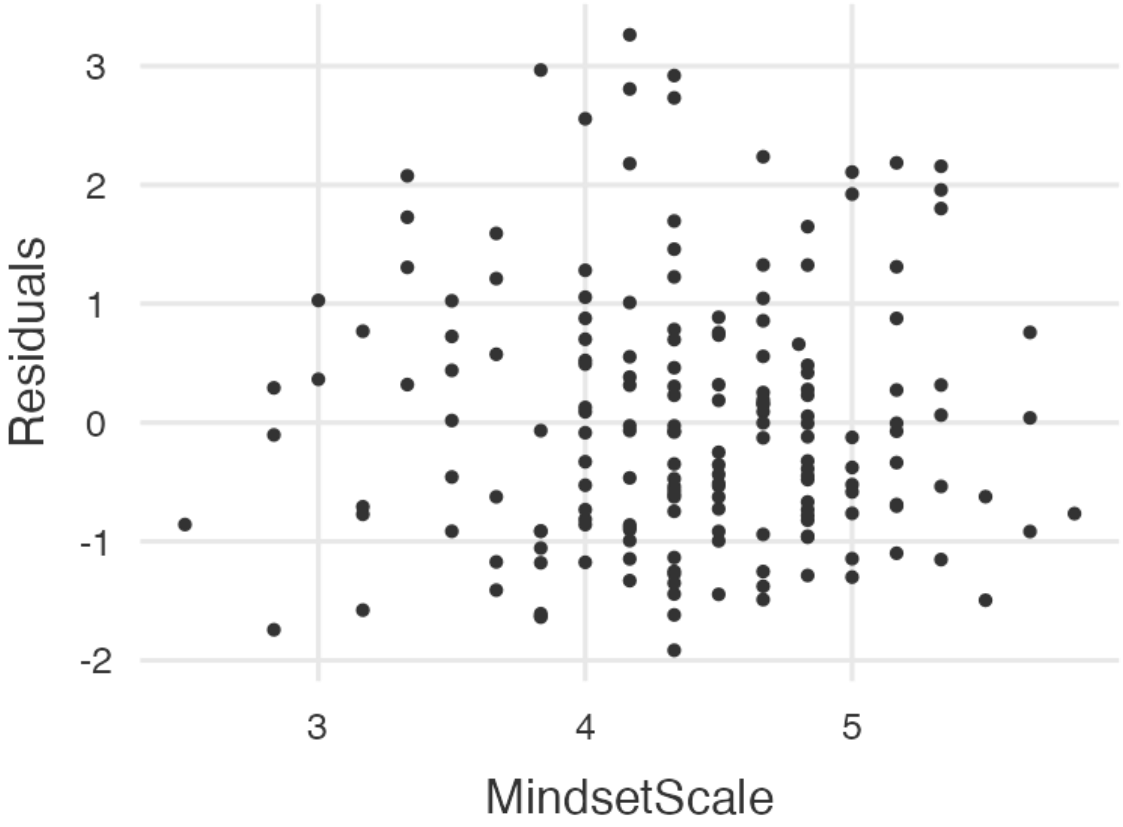
-1
-2
1.5
2.0
2.5
3.0
Fitted

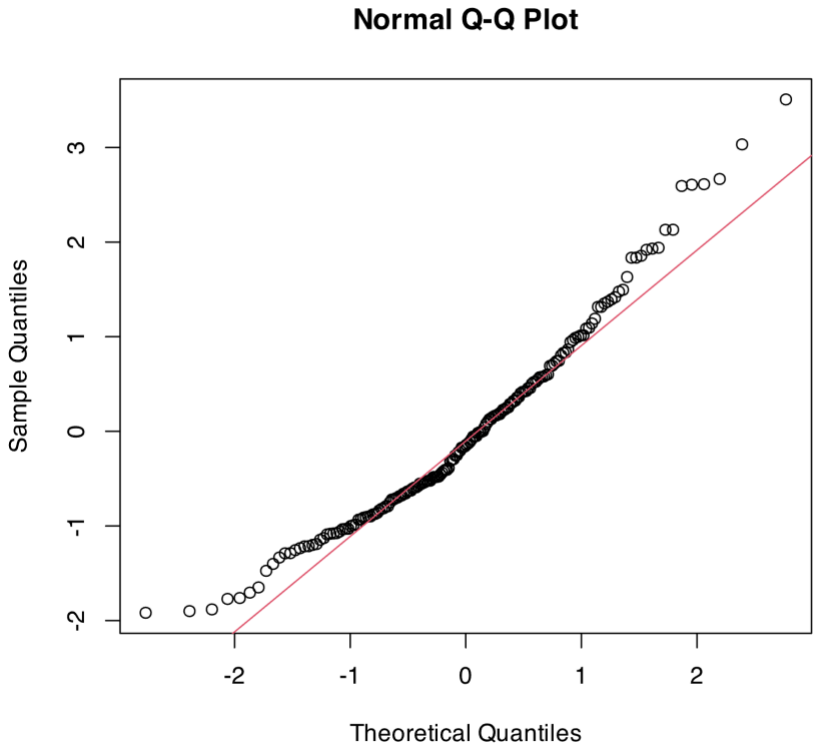

Residuals
3
2
1
0
-1
-2
2
4
6
IntentionsInfidelity


Residuals
3
2
1
0
-1
-2
2
3
4
5
6
7
Conscientiousness


Residuals
3
2
1
0
-1
-2
2
3
4
5
6
7
Agreeableness

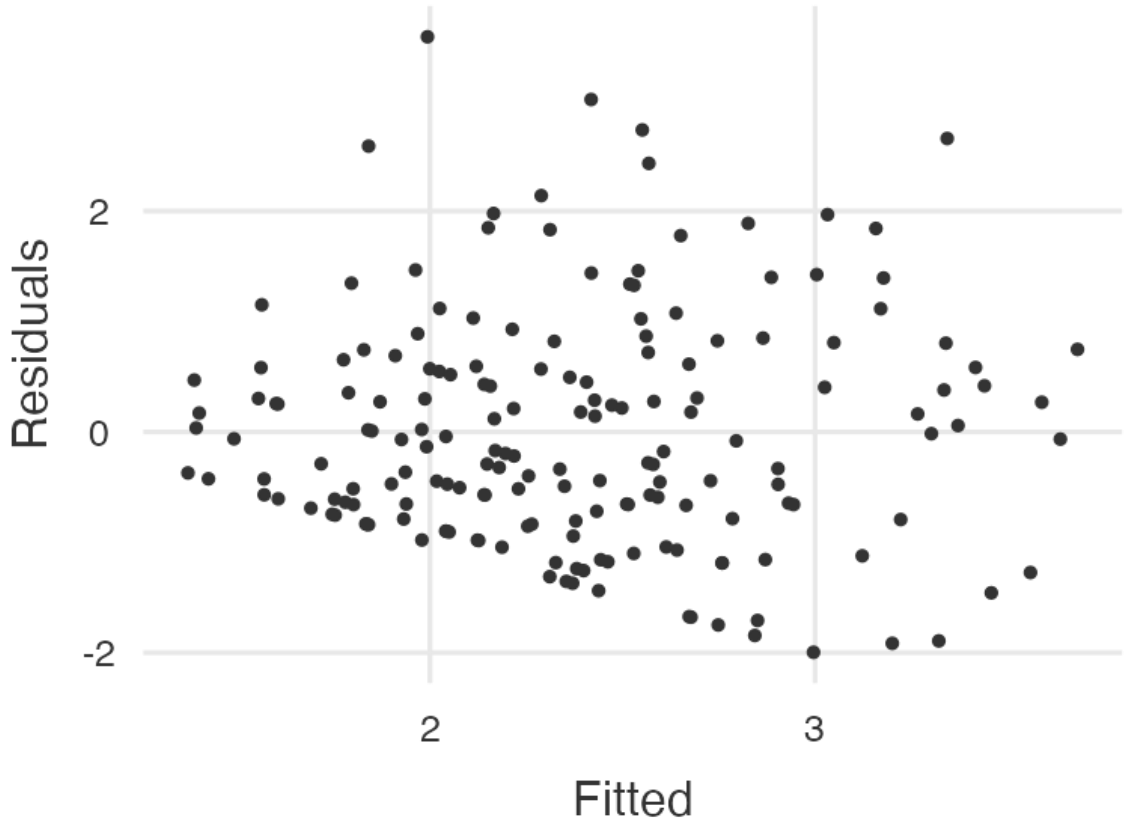


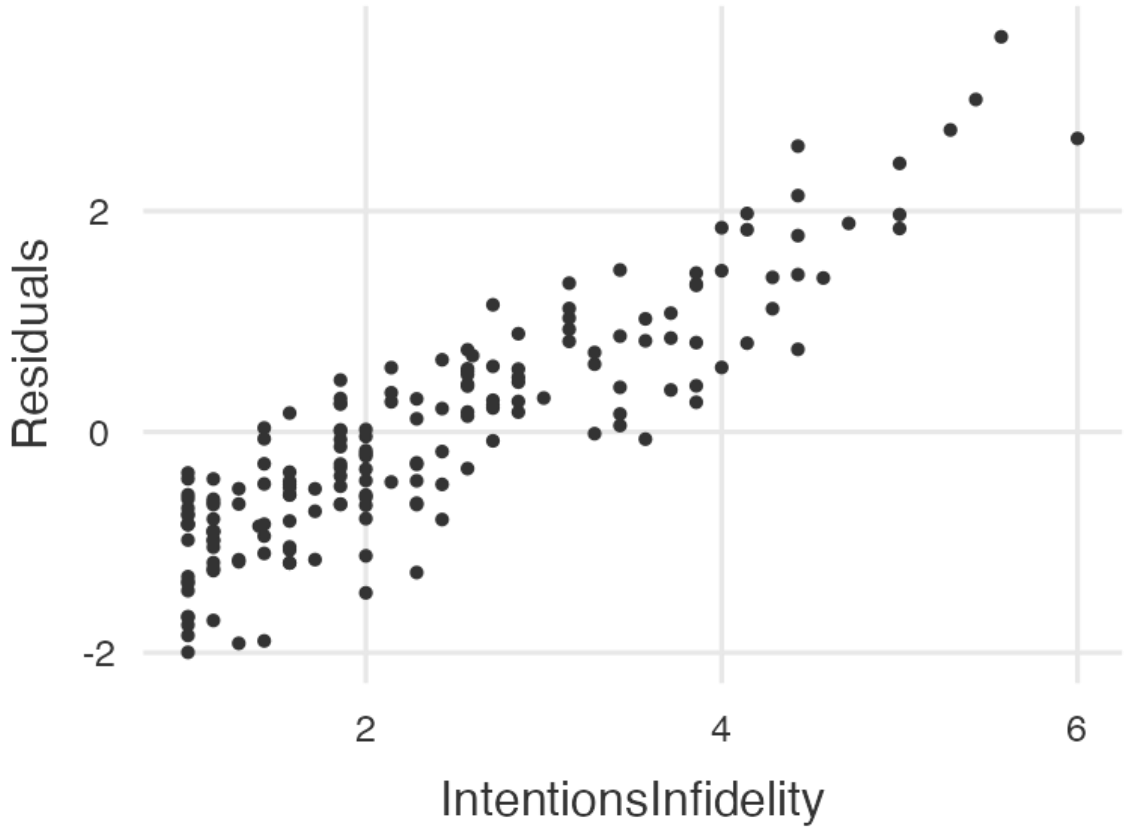
Infidelity Intentions X SOI

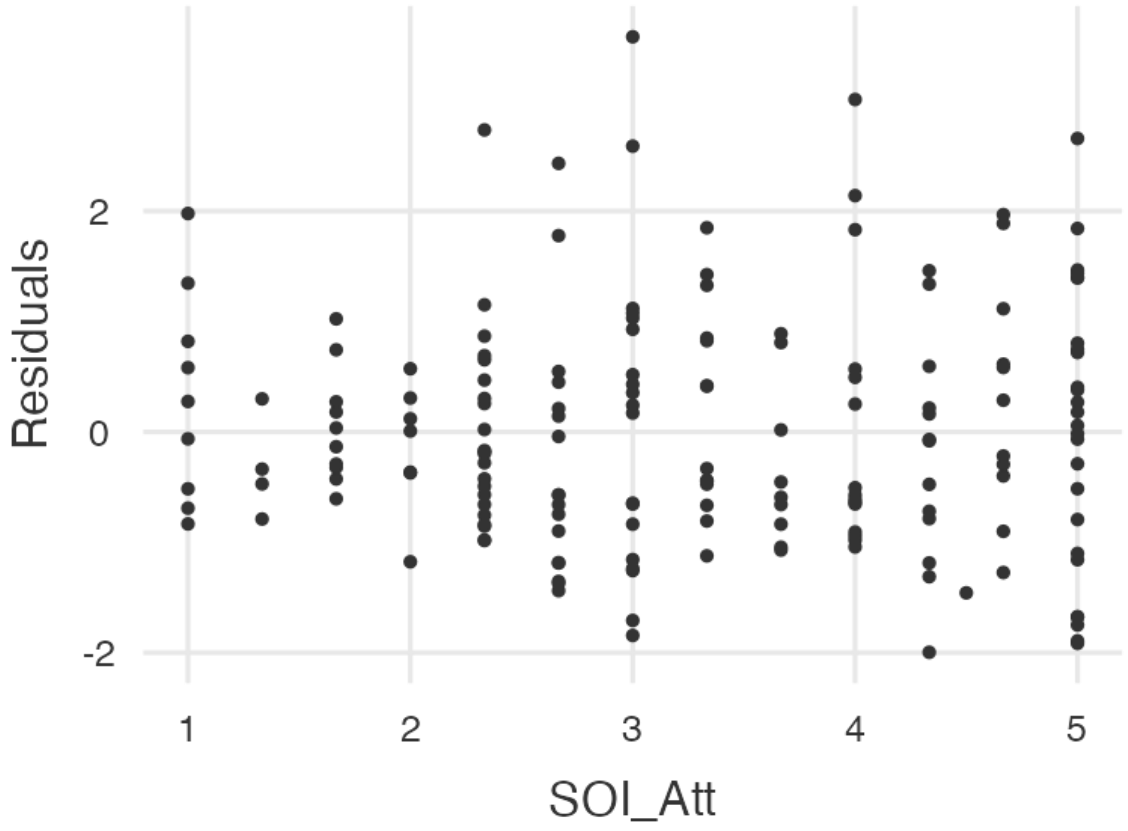


Collinearity Statistics

	VIF	Tolerance
AgeGrouped	1.035	0.966
Nation	1.047	0.955
Gender	1.072	0.933
SOI_Att	1.213	0.825
SOI_Des	1.214	0.824
MindsetScale	1.029	0.972




Residuals
2
0
-2
2
4
6
IntentionsInfidelity


Residuals
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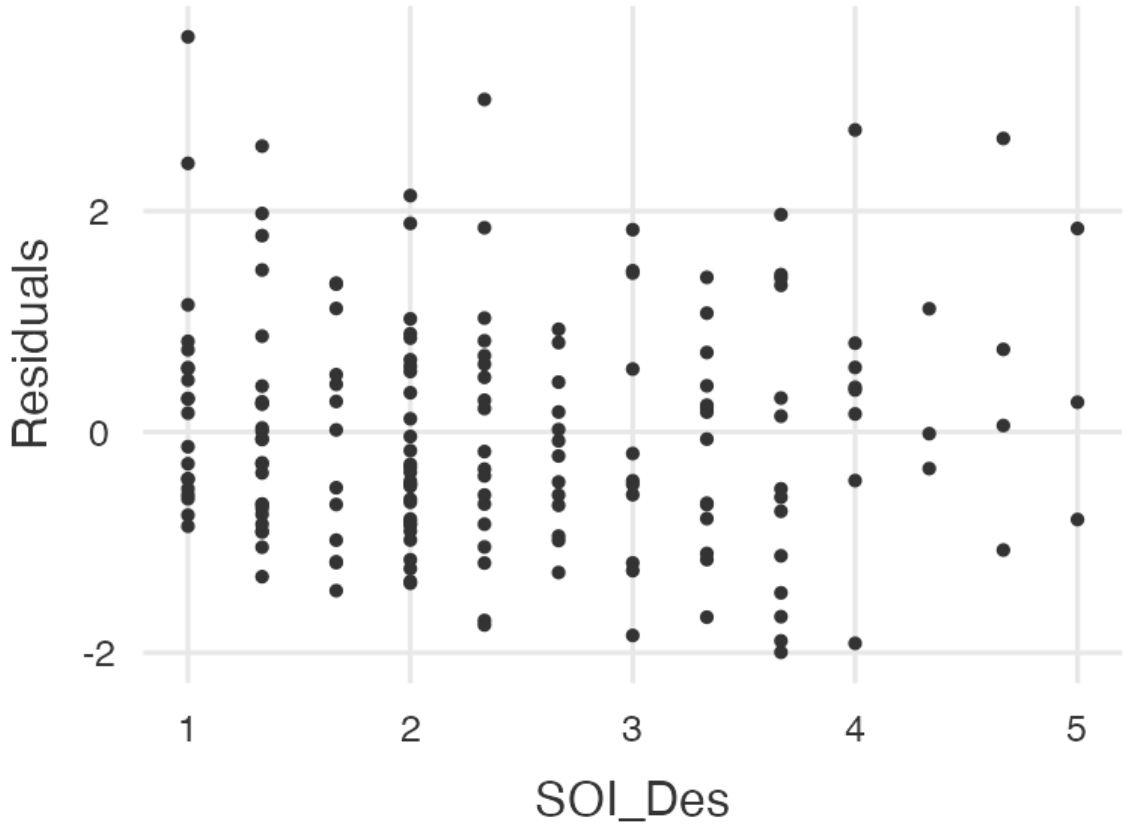
0
-2
1
2
3
4
5
SOI_Att


Residuals
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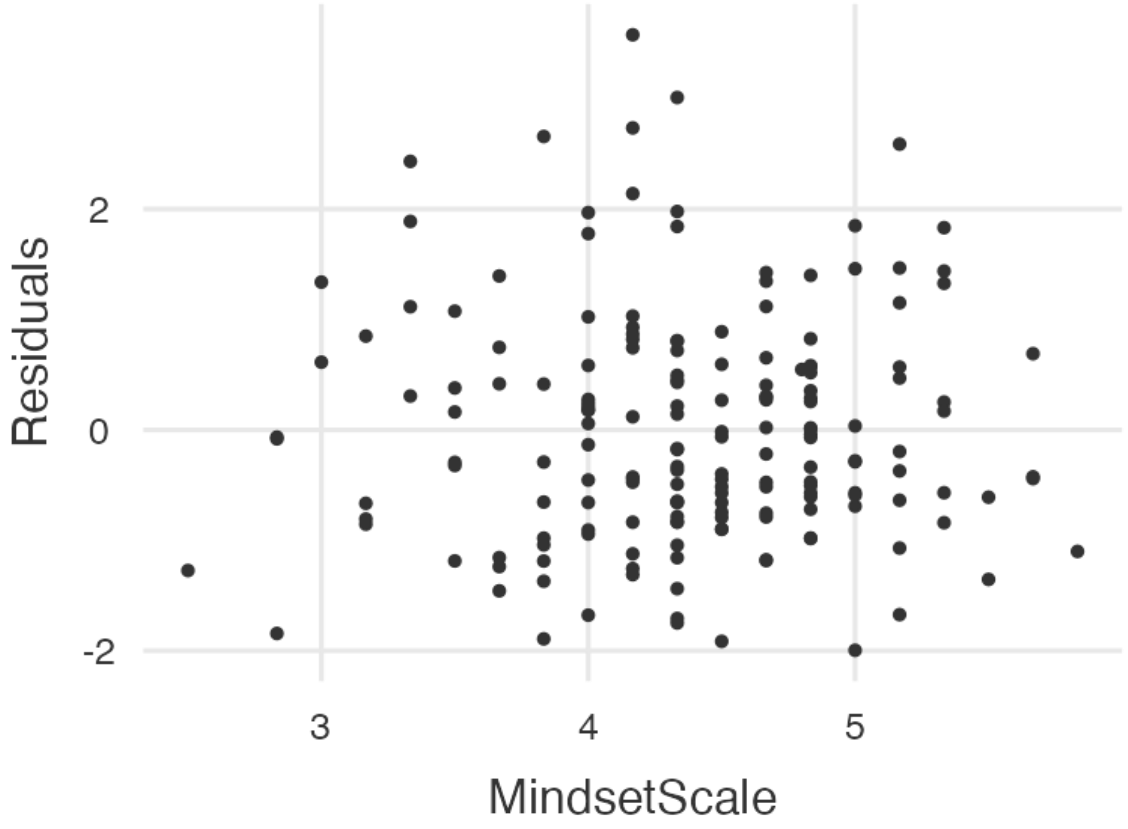
-2
1
2
3
4
5
SOI_Des


Residuals
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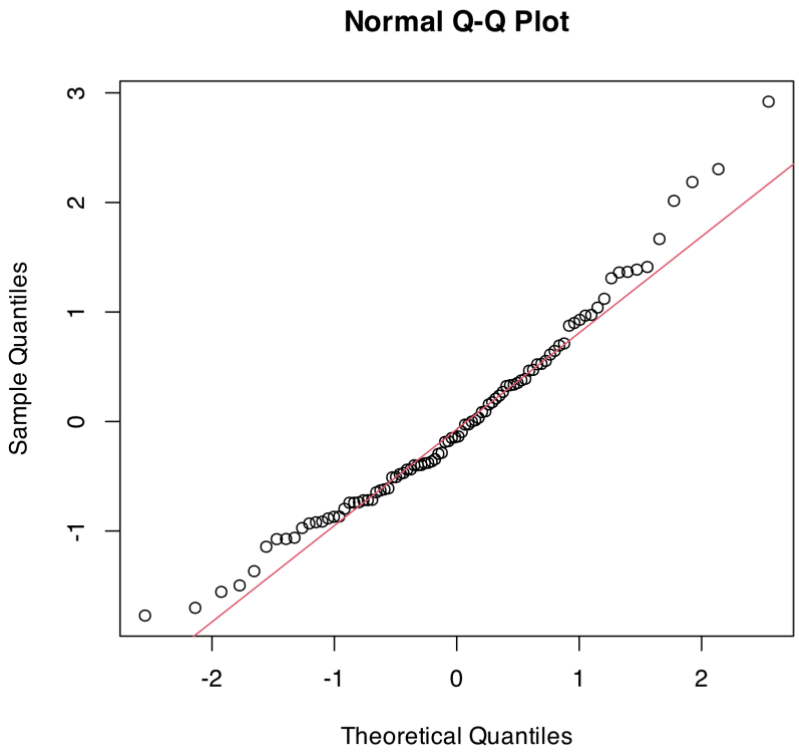
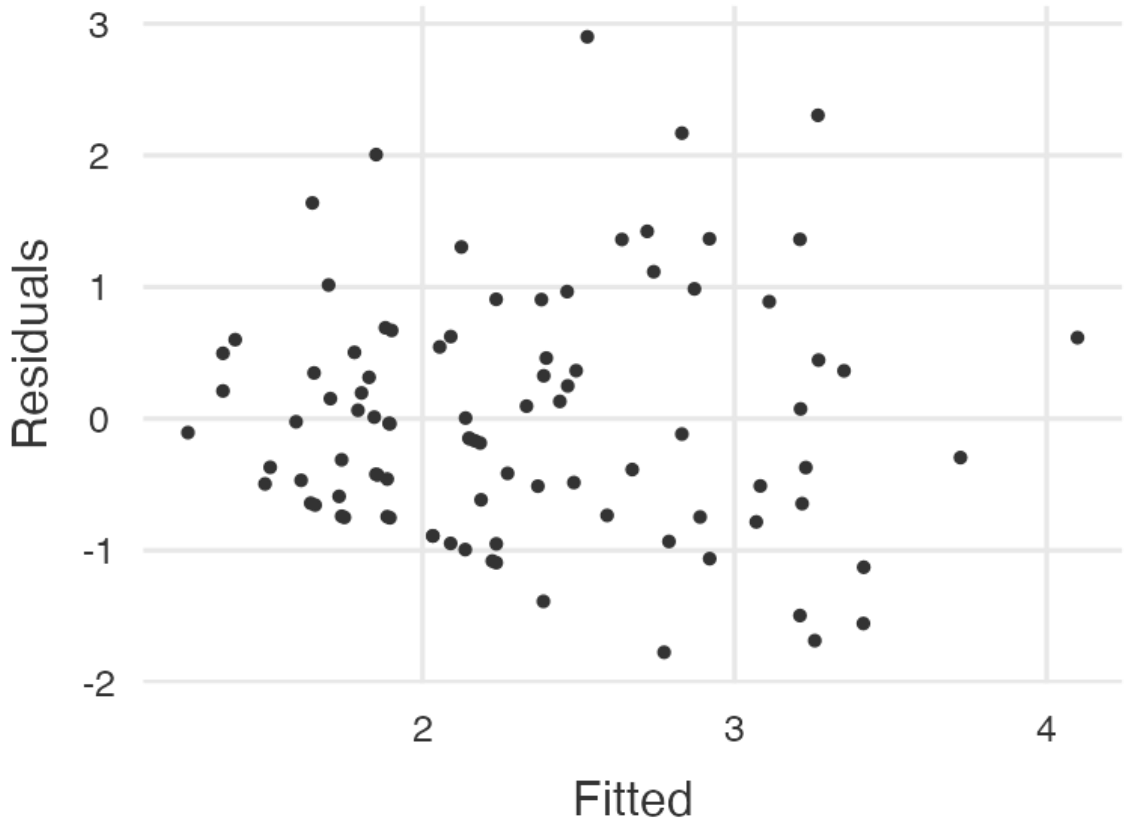
-2
3
4
5
MindsetScale

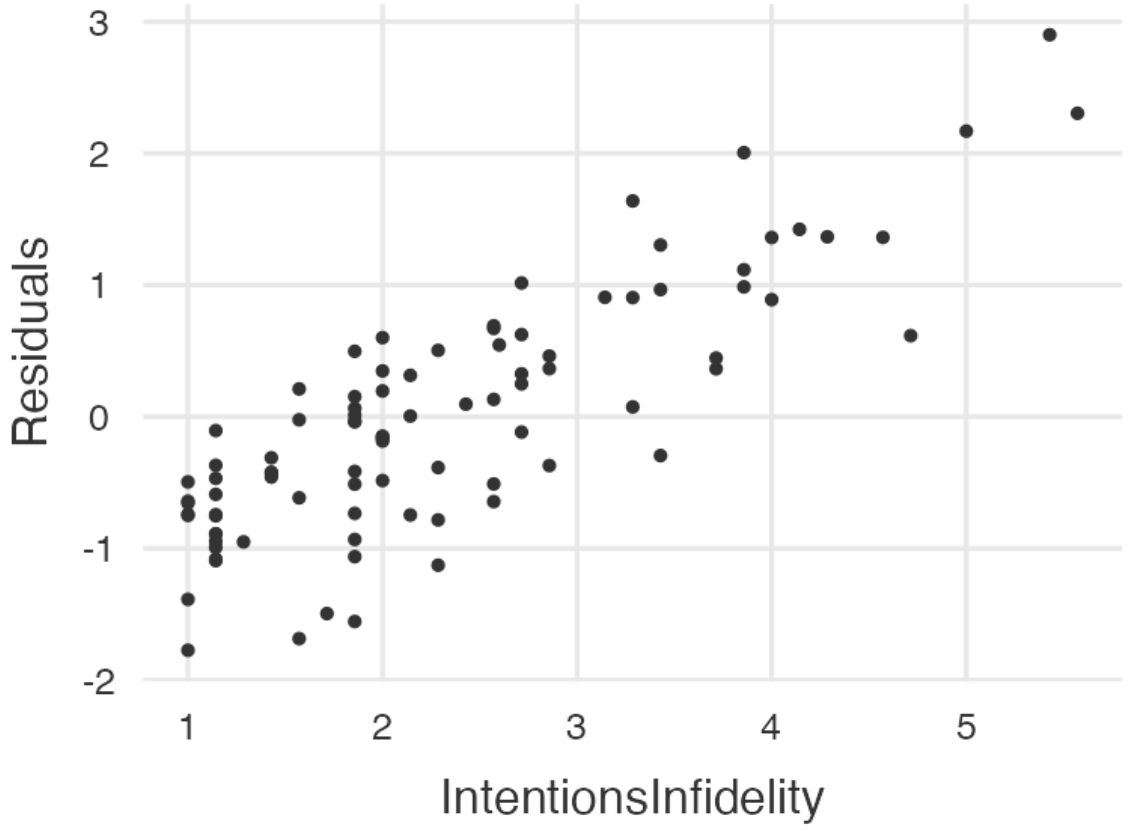
Infidelity Intentions X Attachment

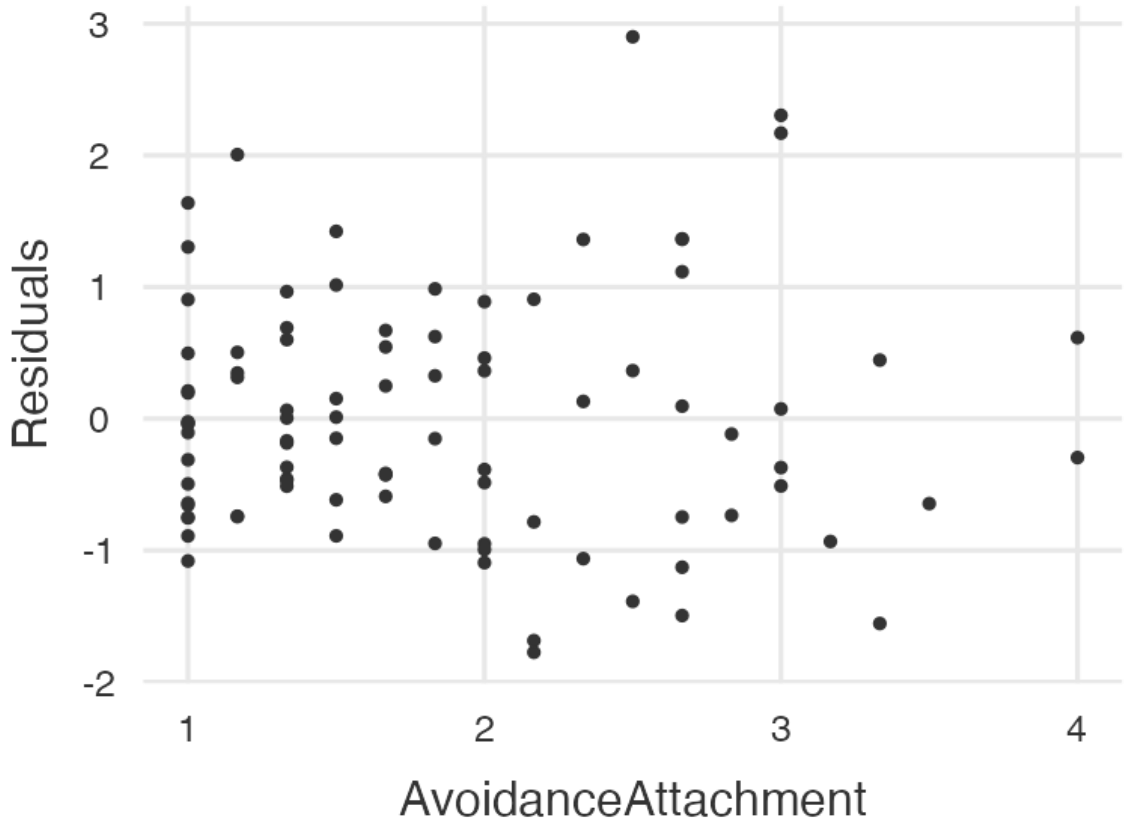


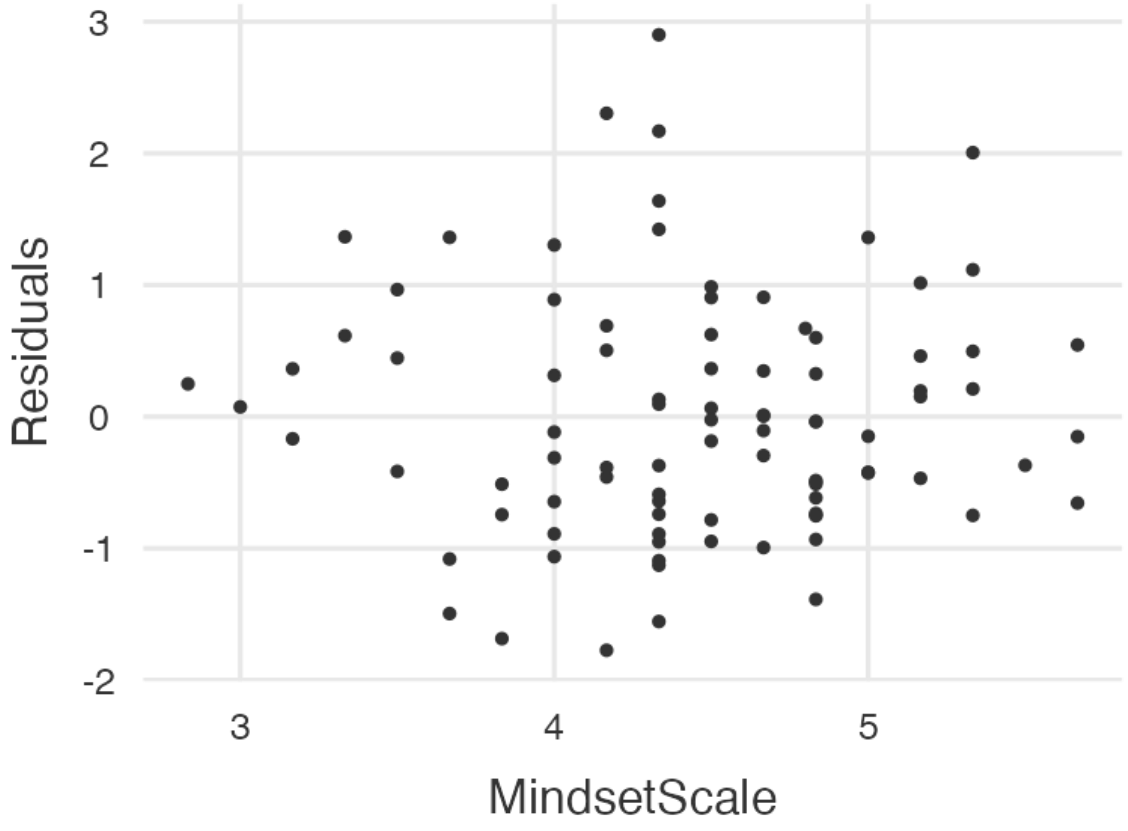
Collinearity Statistics

	VIF	Tolerance
AgeGrouped	1.025	0.975
Nation	1.026	0.975
Gender	1.022	0.979
AvoidanceAttachment	1.056	0.947
MindsetScale	1.061	0.943


Residuals
3
2
1
0
-1
-2
2
3
4
Fitted

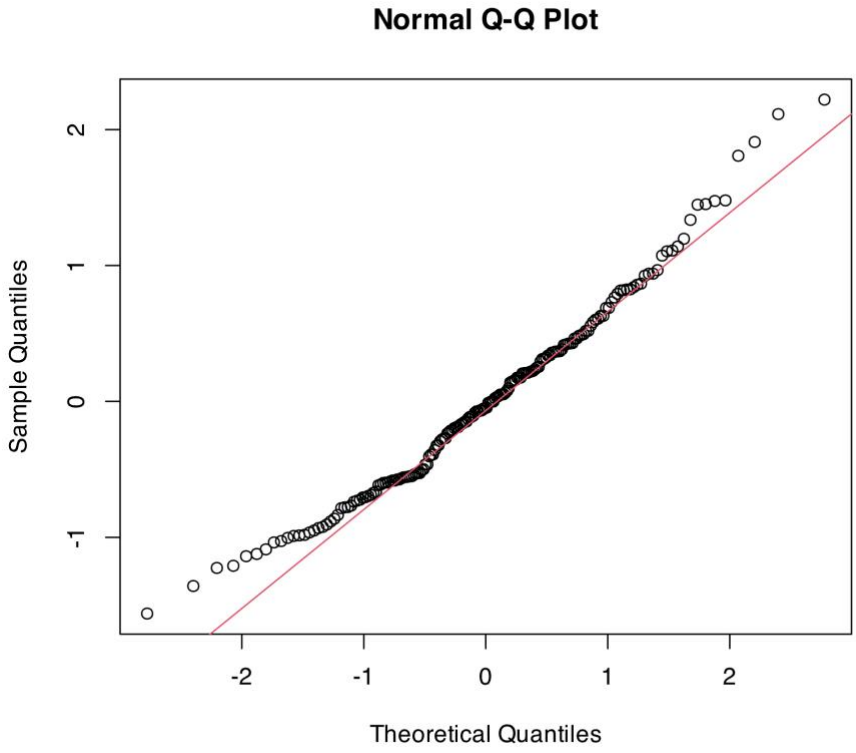

Residuals
3
2
1
0
-1
-2
1
2
3
4
5
IntentionsInfidelity





Assumption Checks - Study 2:

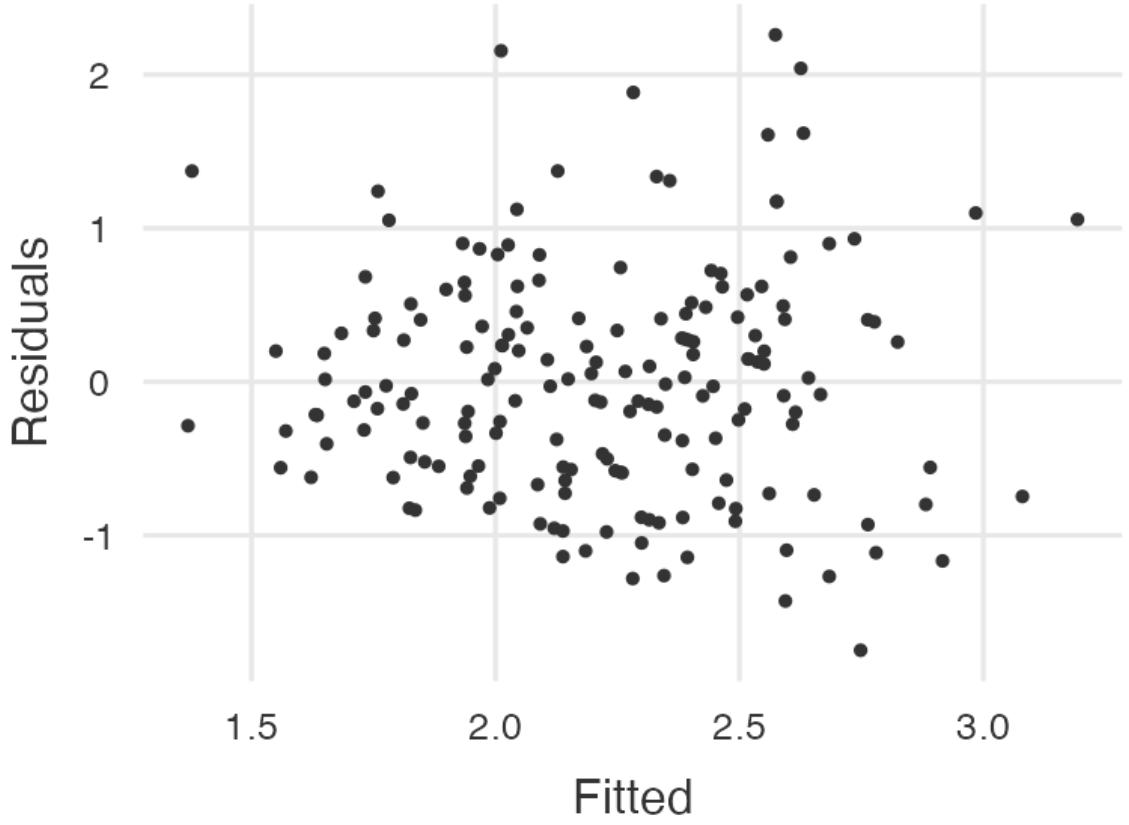
Infidelity Attitudes X Personality

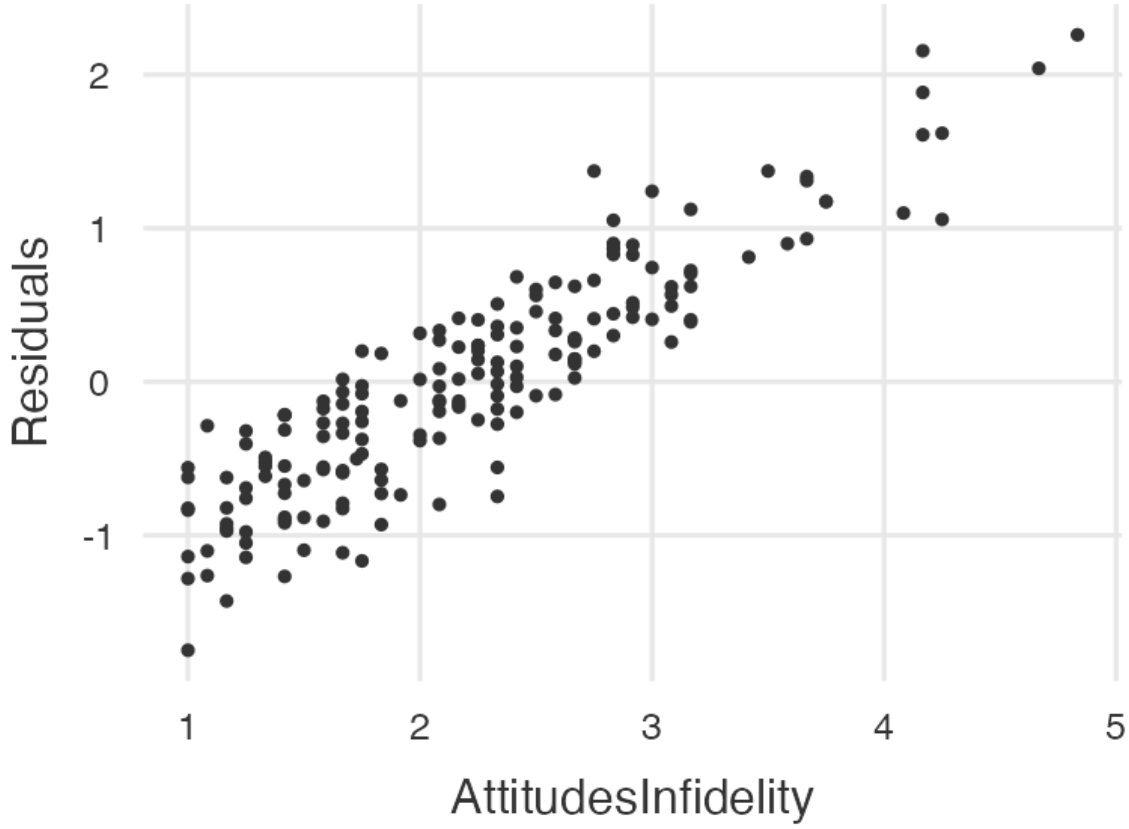


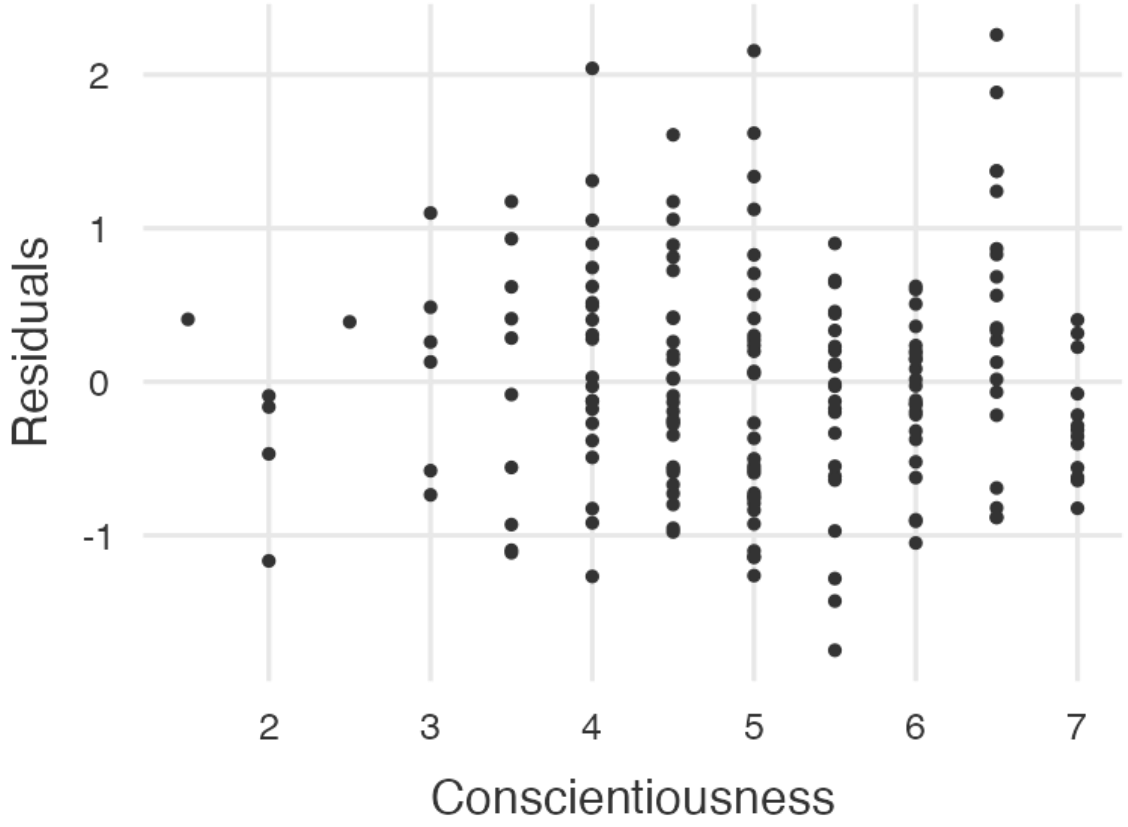
Collinearity Statistics

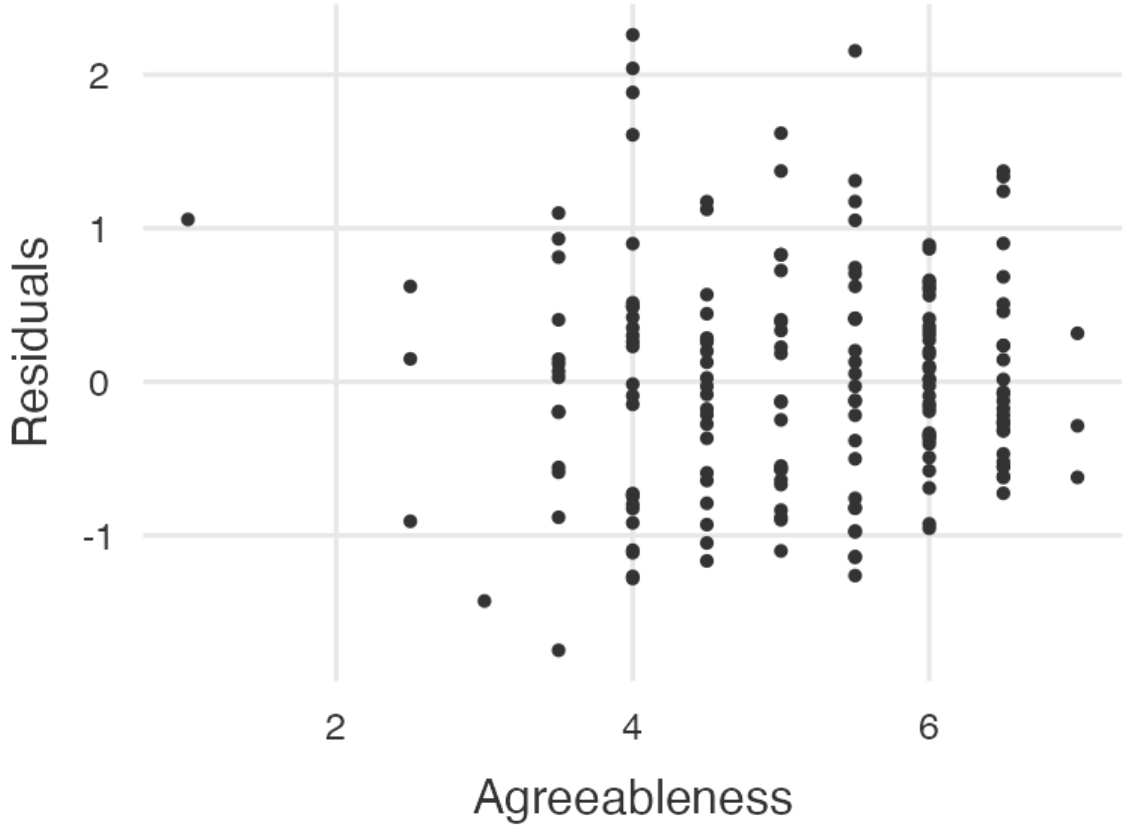
	VIF	Tolerance
AgeGrouped	1.023	0.977
Gender	1.041	0.961
Conscientiousness	1.104	0.906
Agreeableness	1.122	0.891
MindsetScale	1.163	0.860

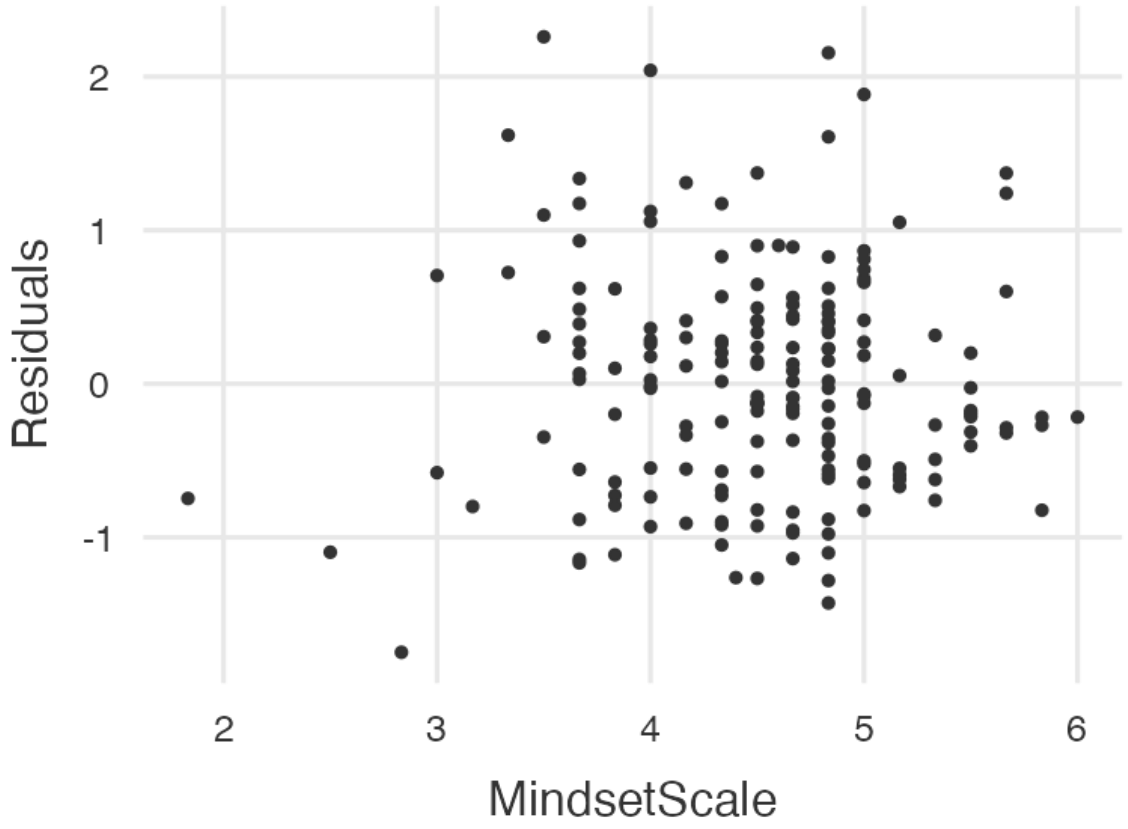
Residual Plots for linearity of data


Residuals
2
1
0
-1
1.5
2.0
2.5
3.0
Fitted

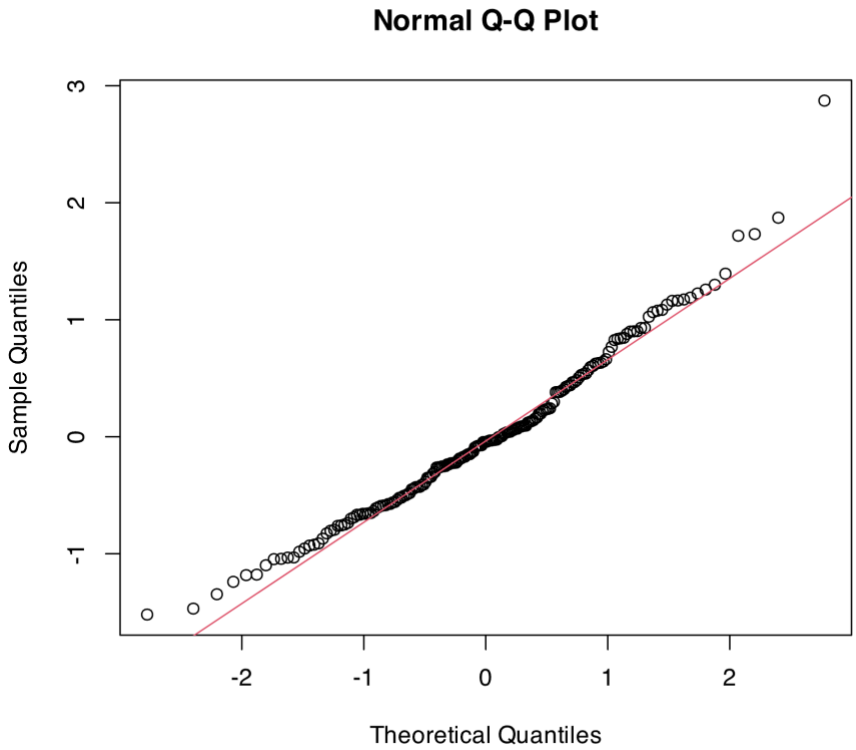

Residuals
2
1
0
-1
1
2
3
4
5
AttitudesInfidelity


Residuals
2
1
0
-1
2
3
4
5
6
7
Conscientiousness


Residuals
2
1
0
-1
2
4
6
Agreeableness



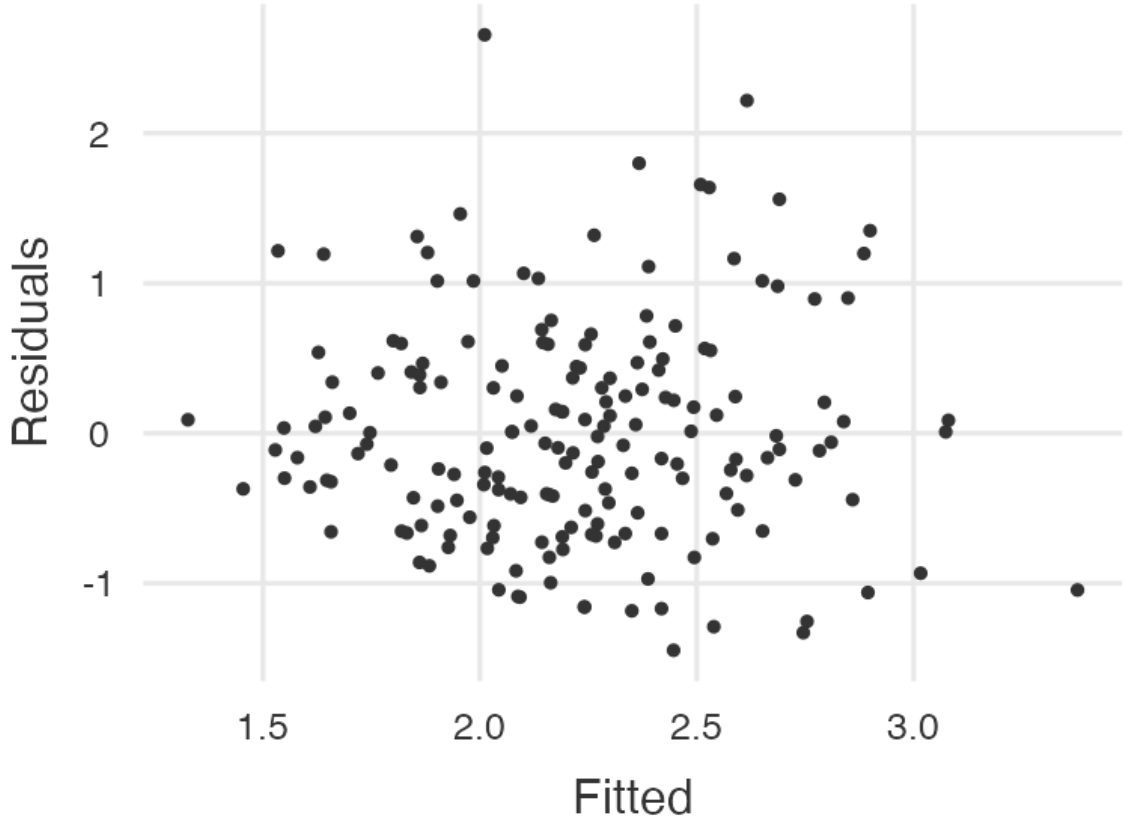
Infidelity Attitudes X SOI

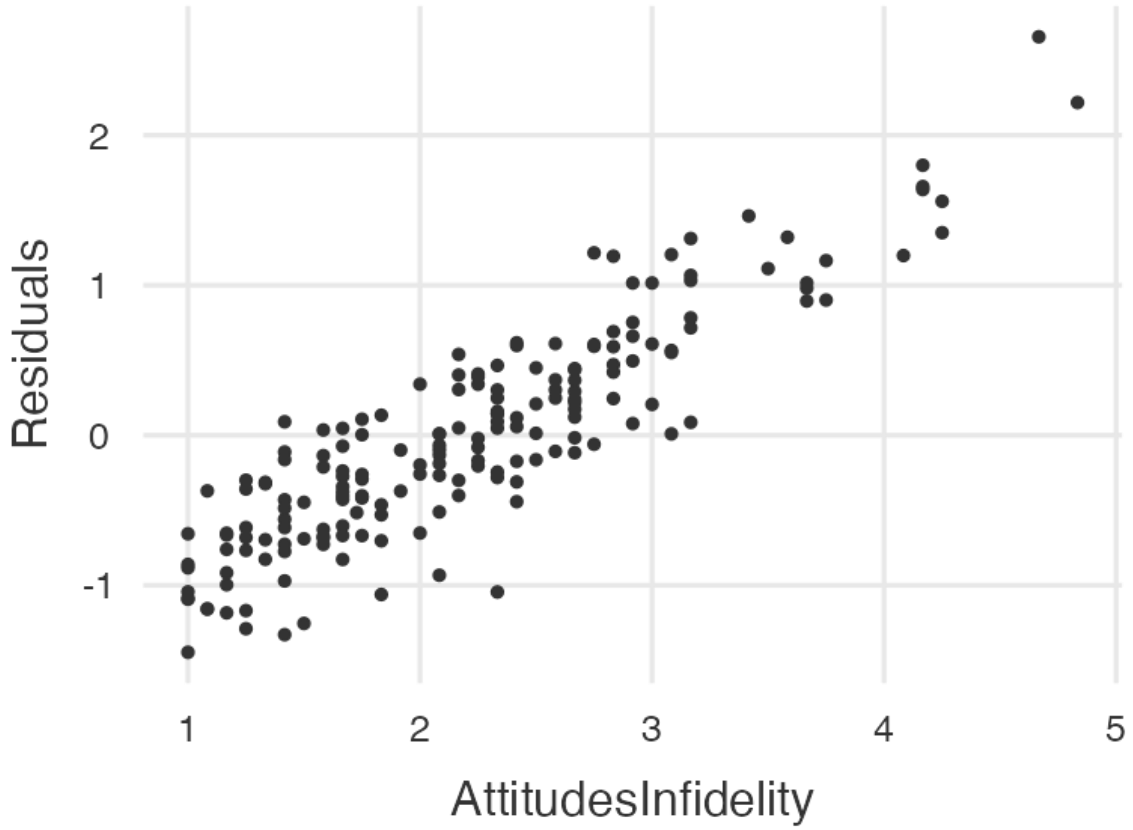


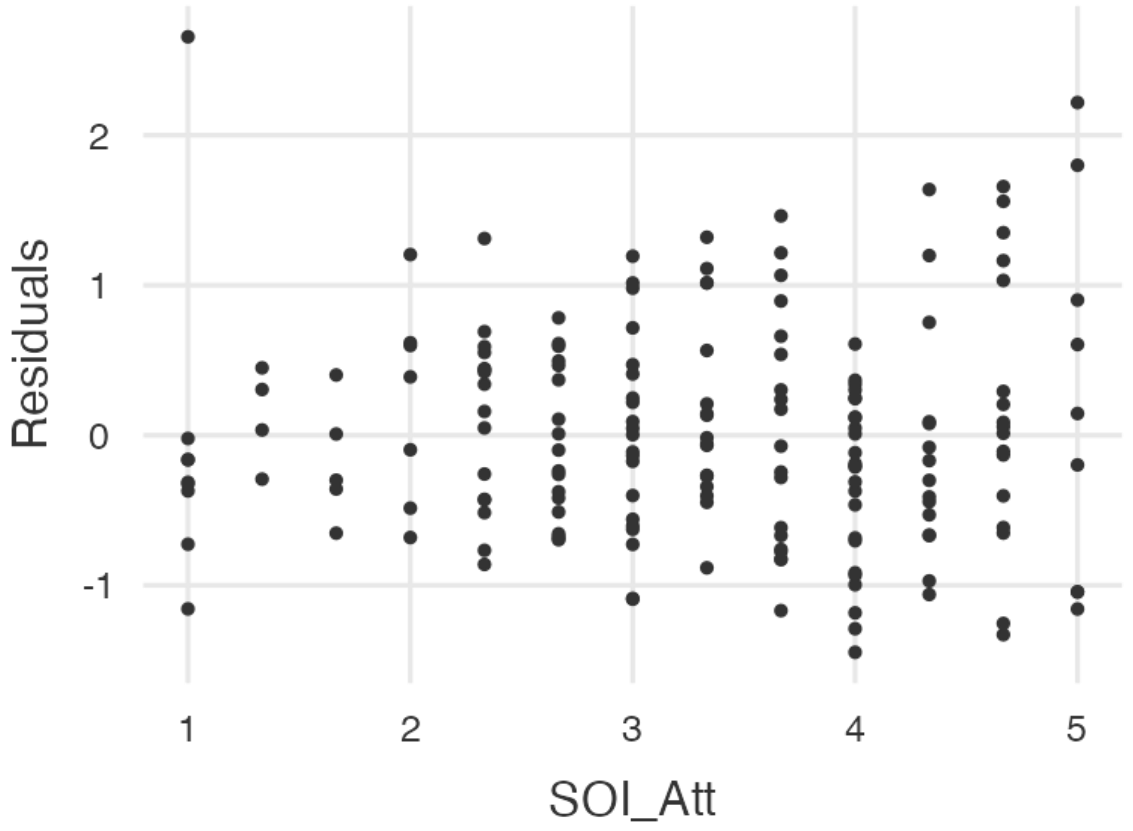
Collinearity Statistics

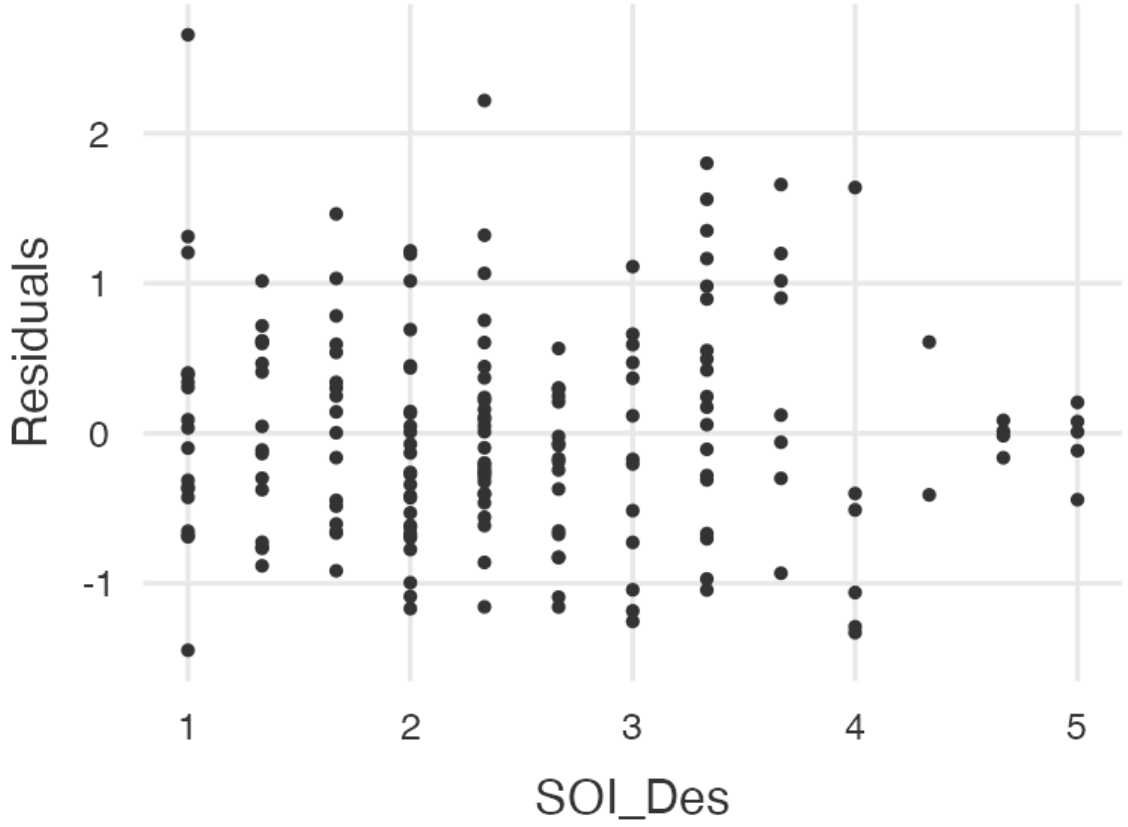
	VIF	Tolerance
AgeGrouped	1.012	0.988
Gender	1.099	0.910
SOI_Att	1.148	0.871
SOI_Des	1.197	0.836
MindsetScale	1.026	0.974

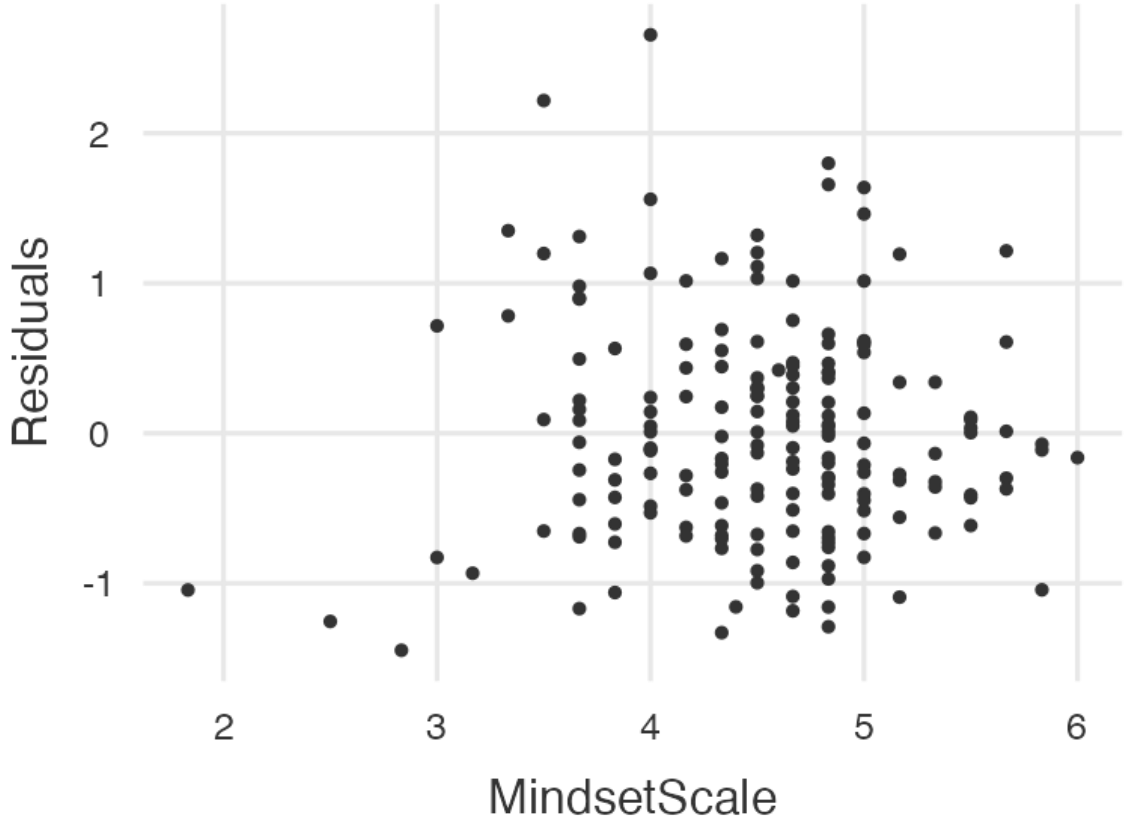
Residual Plots for linearity of data



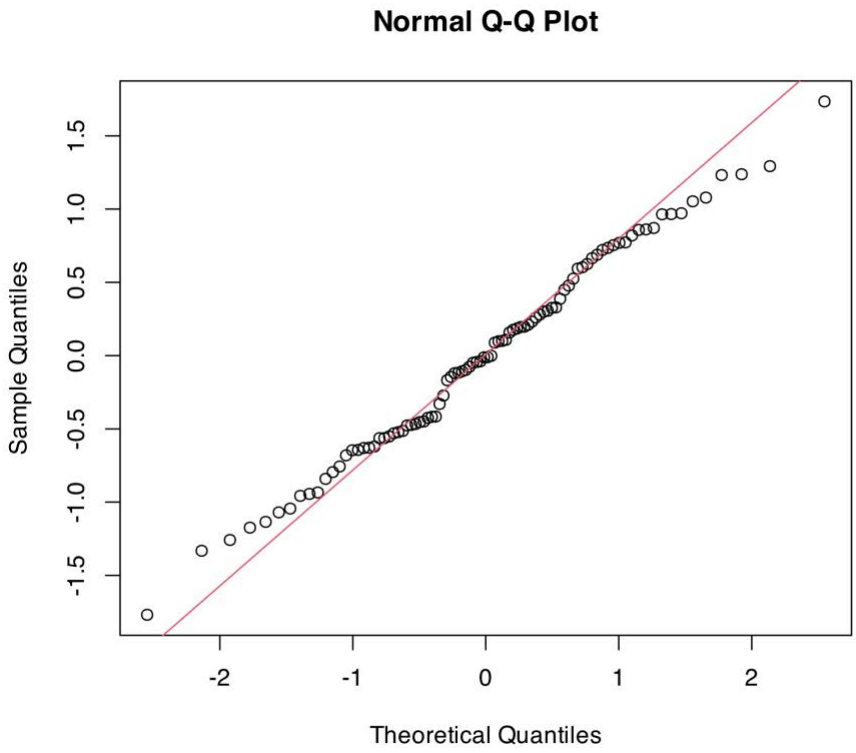

Residuals
2
1
0
-1
1
2
3
4
5
AttitudesInfidelity


Residuals
2
1
0
-1
1
2
3
4
5
SOI_Att



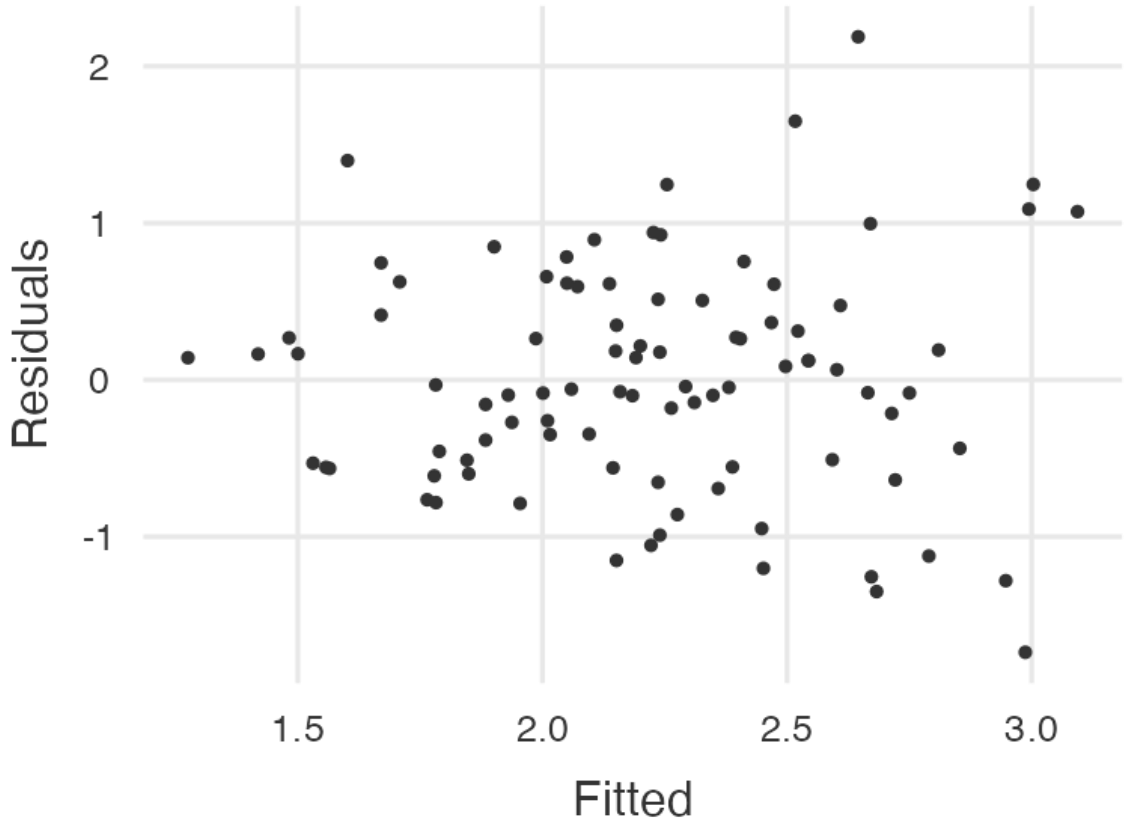


Infidelity Attitudes X Attachment



Collinearity Statistics

	VIF	Tolerance
AgeGrouped	1.030	0.971
Gender	1.017	0.983
AvoidanceAttachment	1.018	0.982
MindsetScale	1.070	0.934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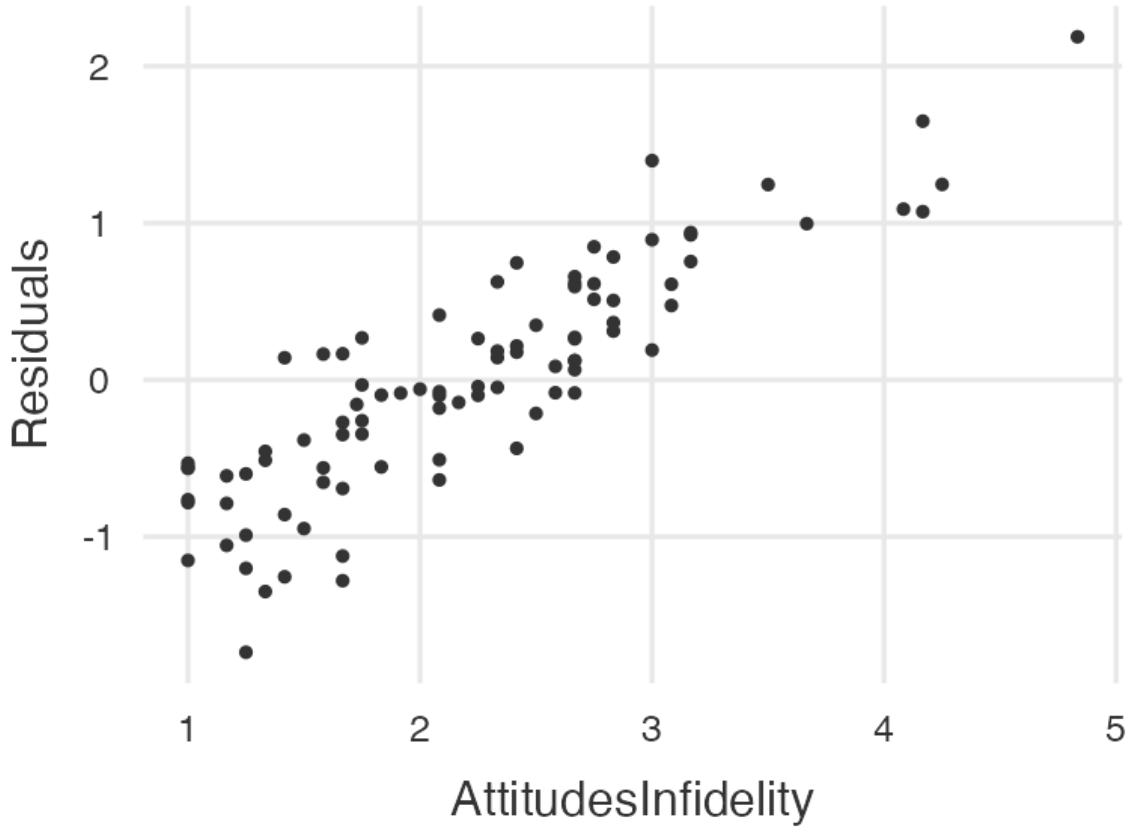
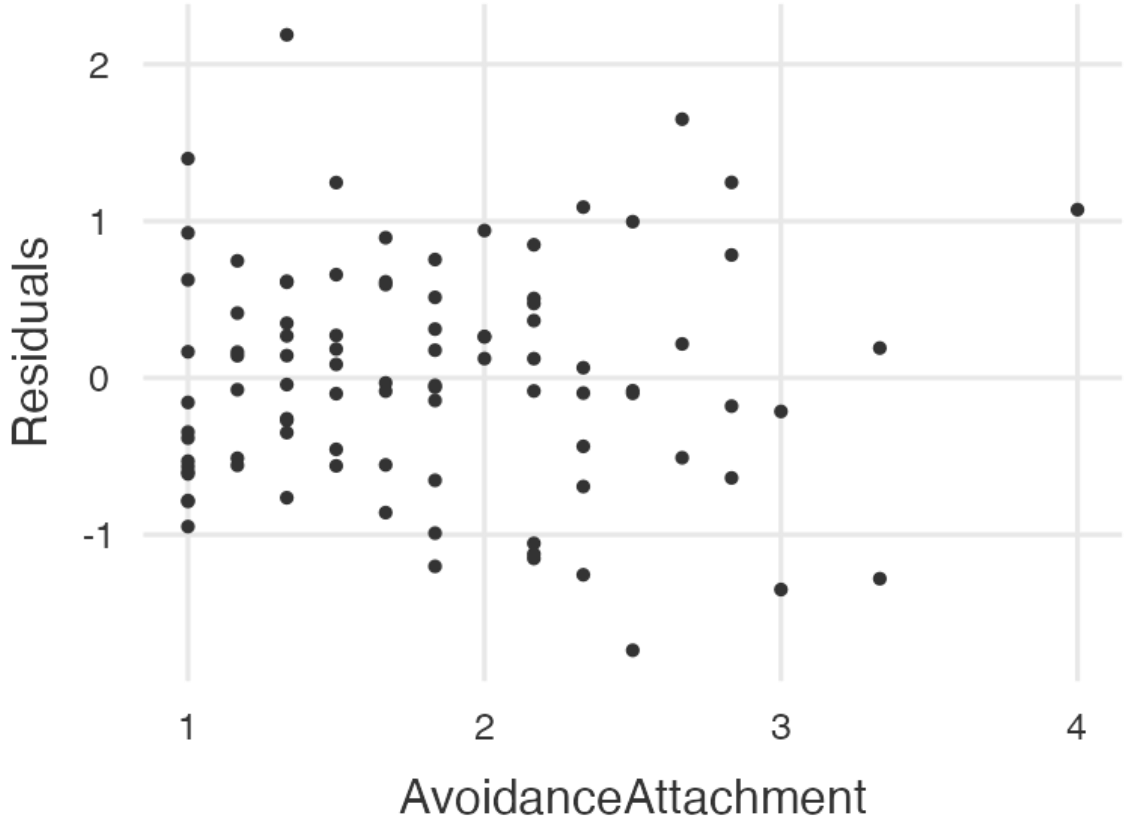
1.5
2.0
2.5
3.0
Fitted


Residuals
2
1
0
-1
1
2
3
4
5
AttitudesInfidelity


Residuals
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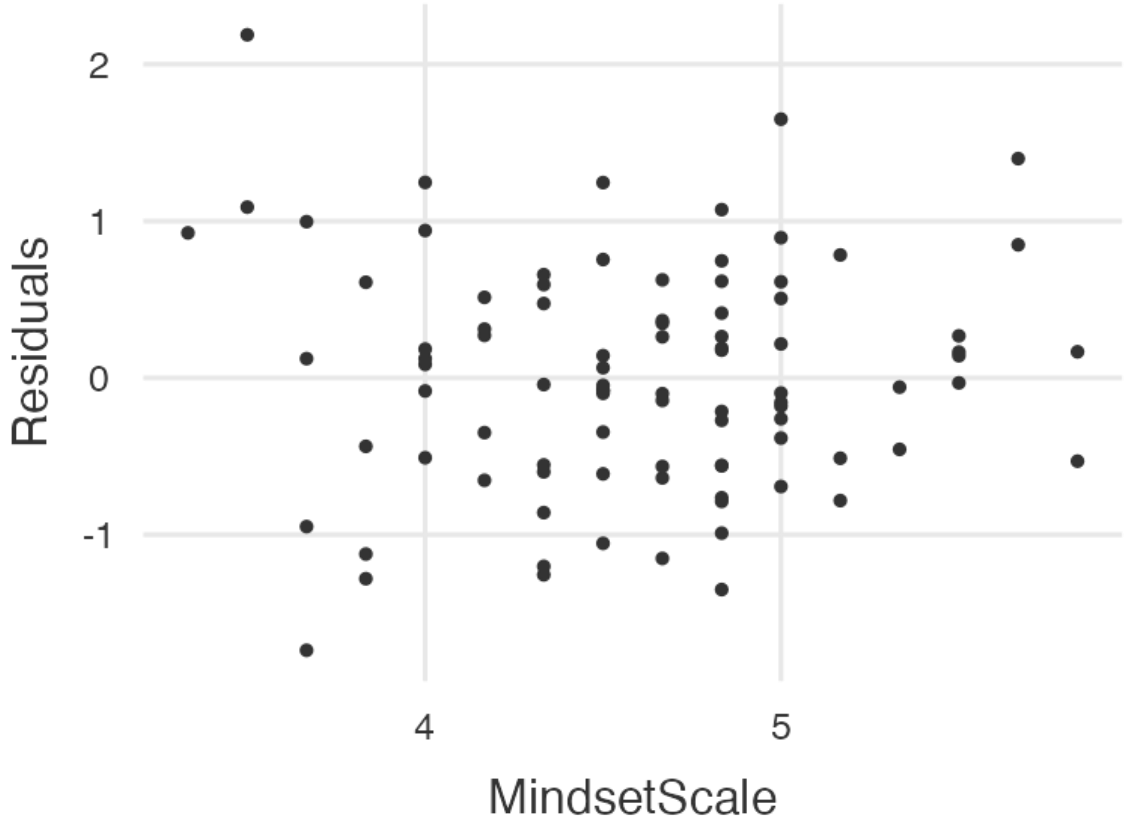
0
-1
1
2
3
4
AvoidanceAttachment


Residuals
2
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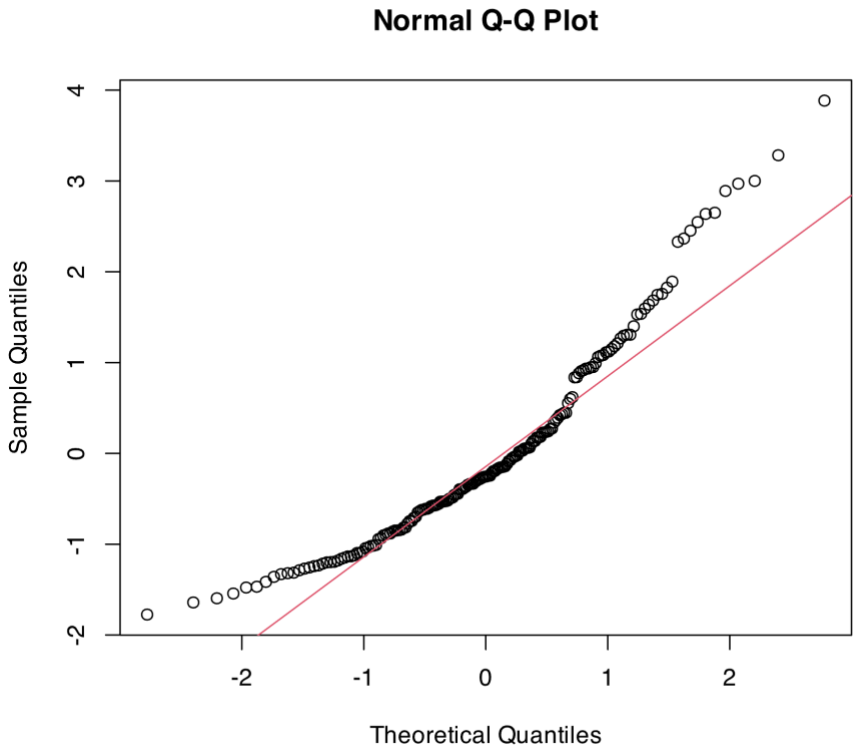
0
-1
4
5
MindsetScale

Infidelity Intentions X Personality



Collinearity Statistics

	VIF	Tolerance
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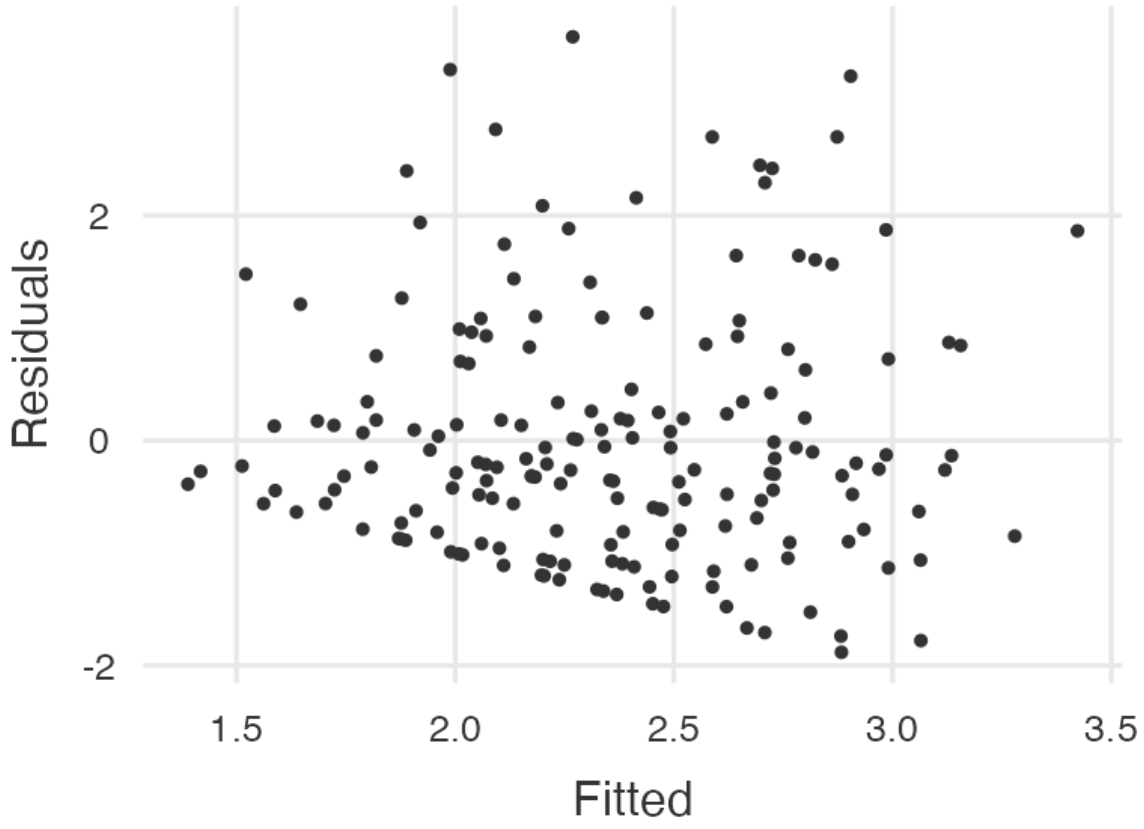
Gender	1.041	0.961
Agreeableness	1.122	0.891
Conscientiousness	1.104	0.906
MindsetScale	1.163	0.860


Residuals
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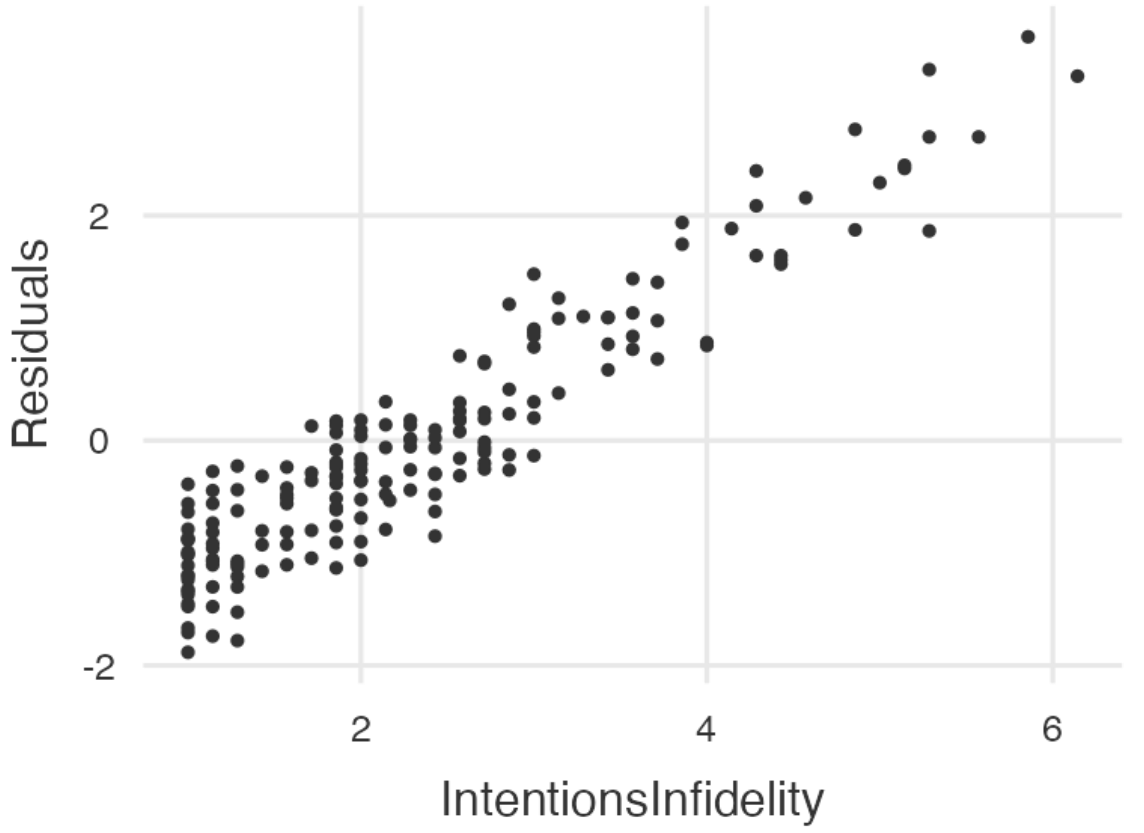
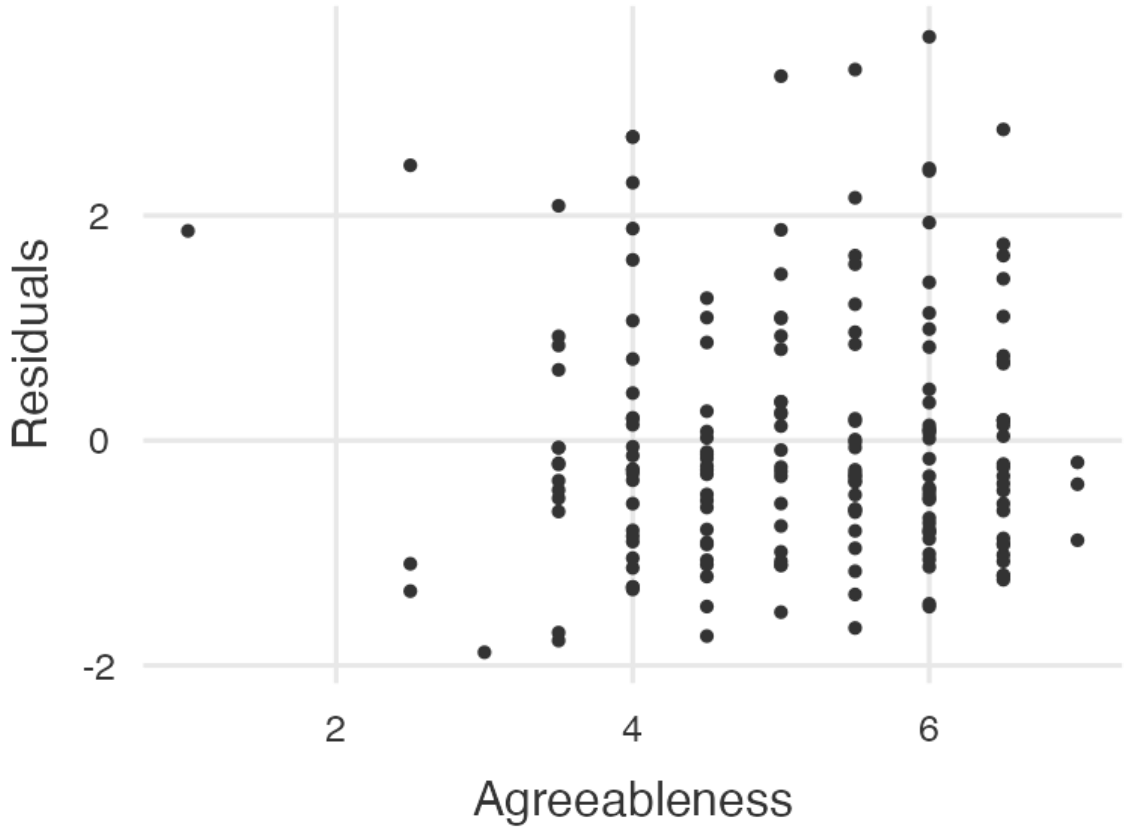
-2
1.5
2.0
2.5
3.0
3.5
Fitted


Residuals
2
0
-2
2
4
6
IntentionsInfidelity


Residuals
2
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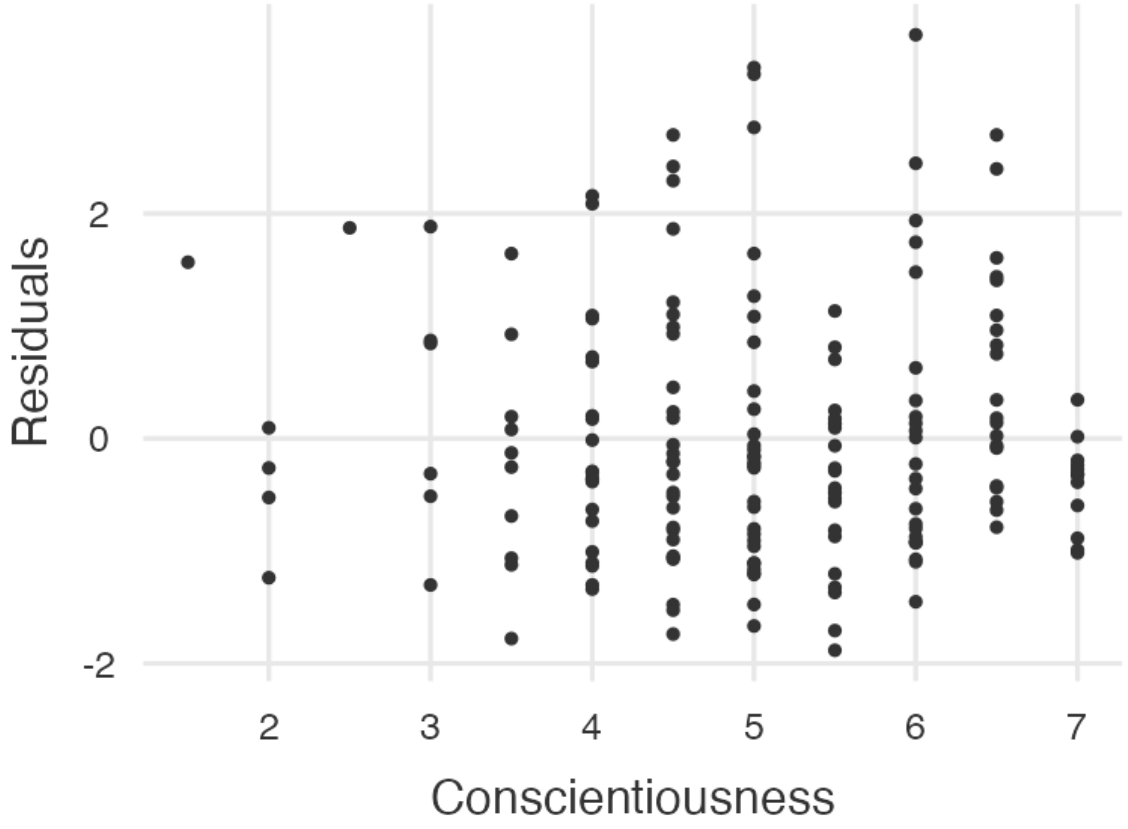
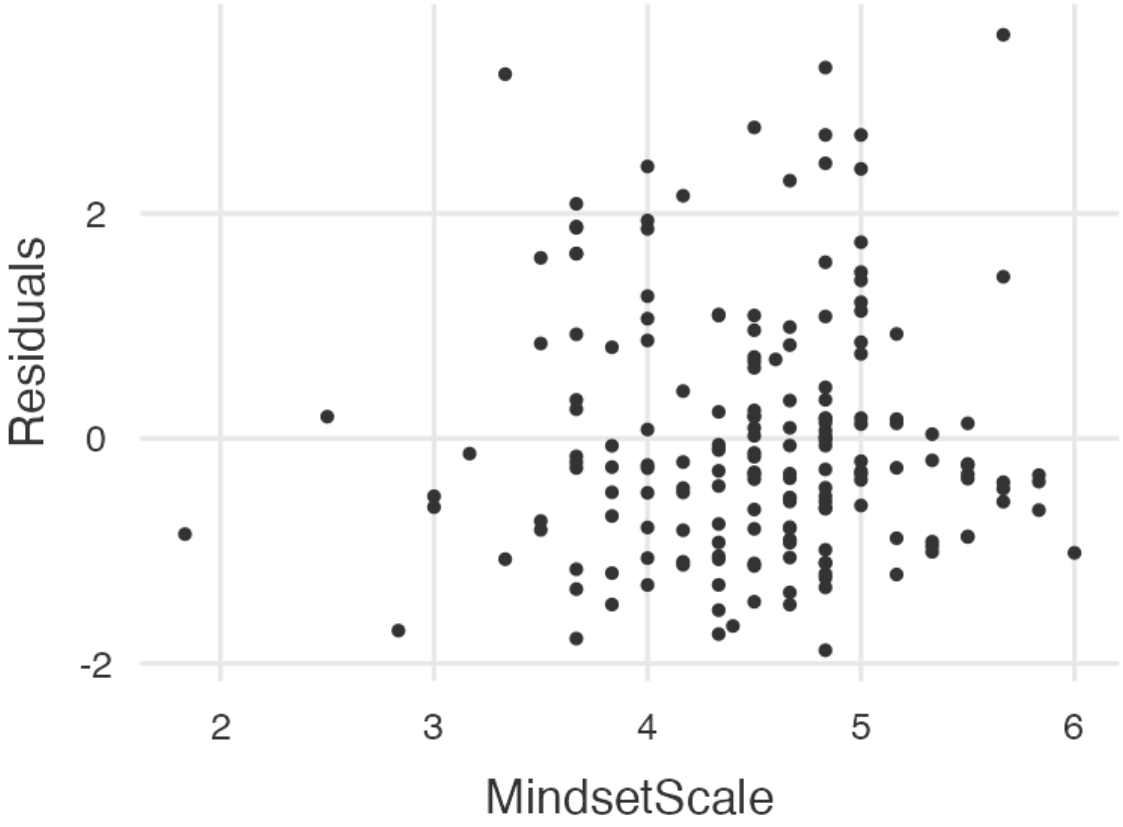
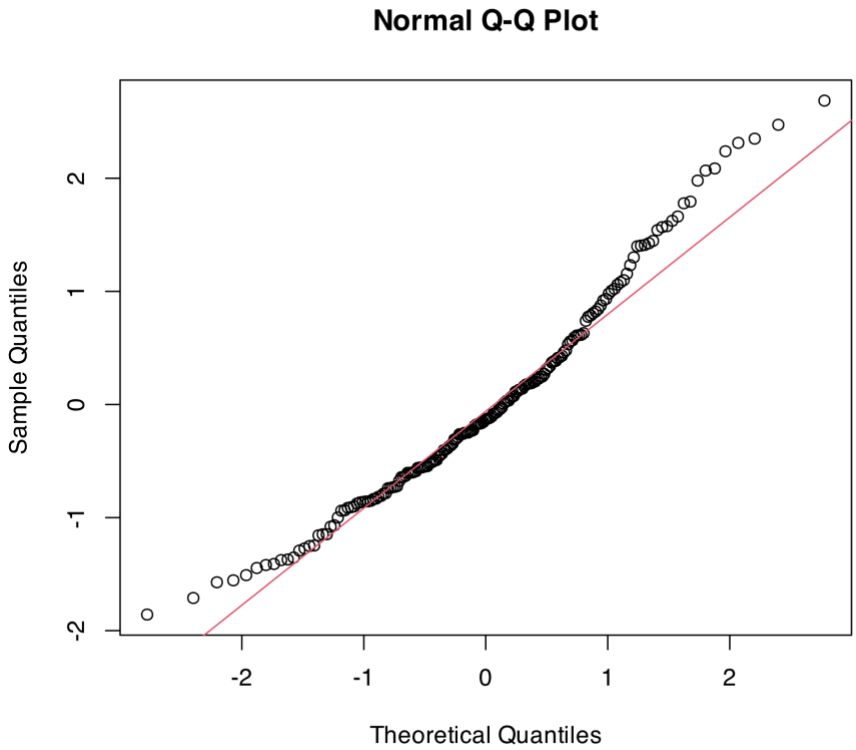
-2
2
4
6
Agreeableness


Residuals
2
0
-2
2
3
4
5
6
7
Conscientiousness



Infidelity Intentions X SOI



Collinearity Statistics

	VIF	Tolerance
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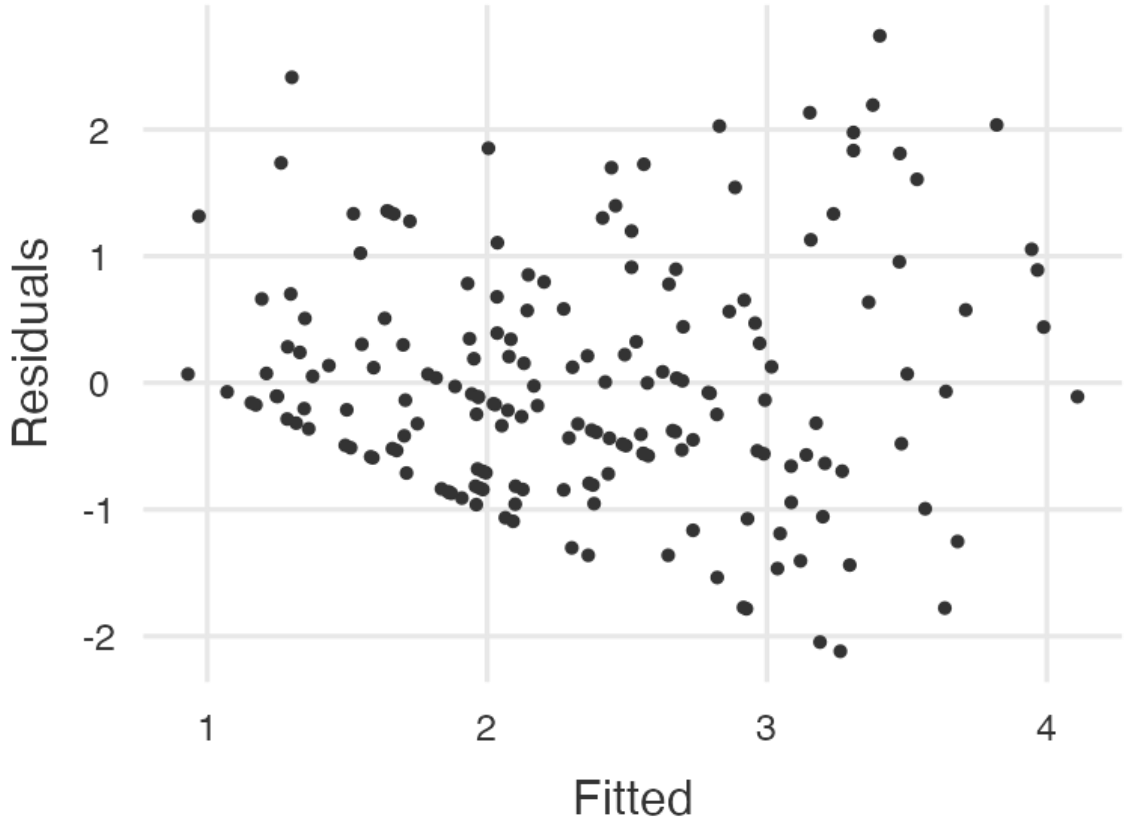
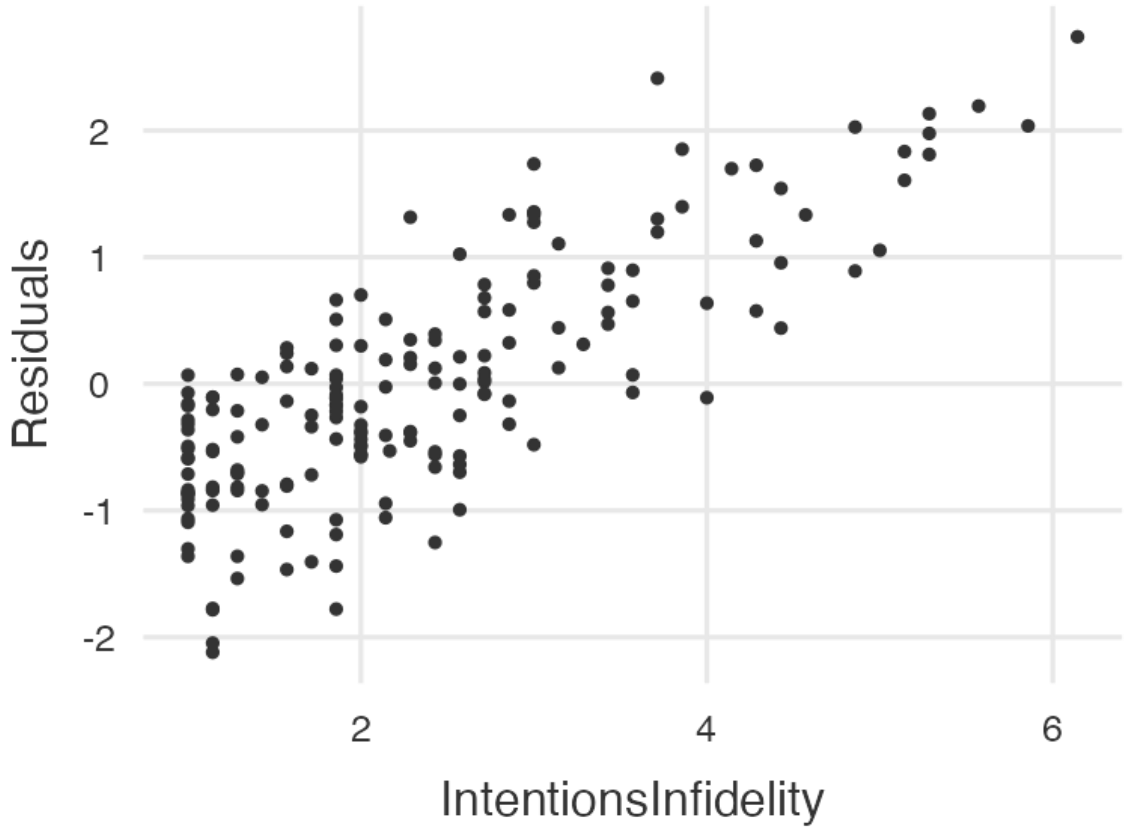
Gender	1.099	0.910
SOI_Att	1.148	0.871
SOI_Des	1.197	0.836
MindsetScale	1.026	0.974

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-2
2
4
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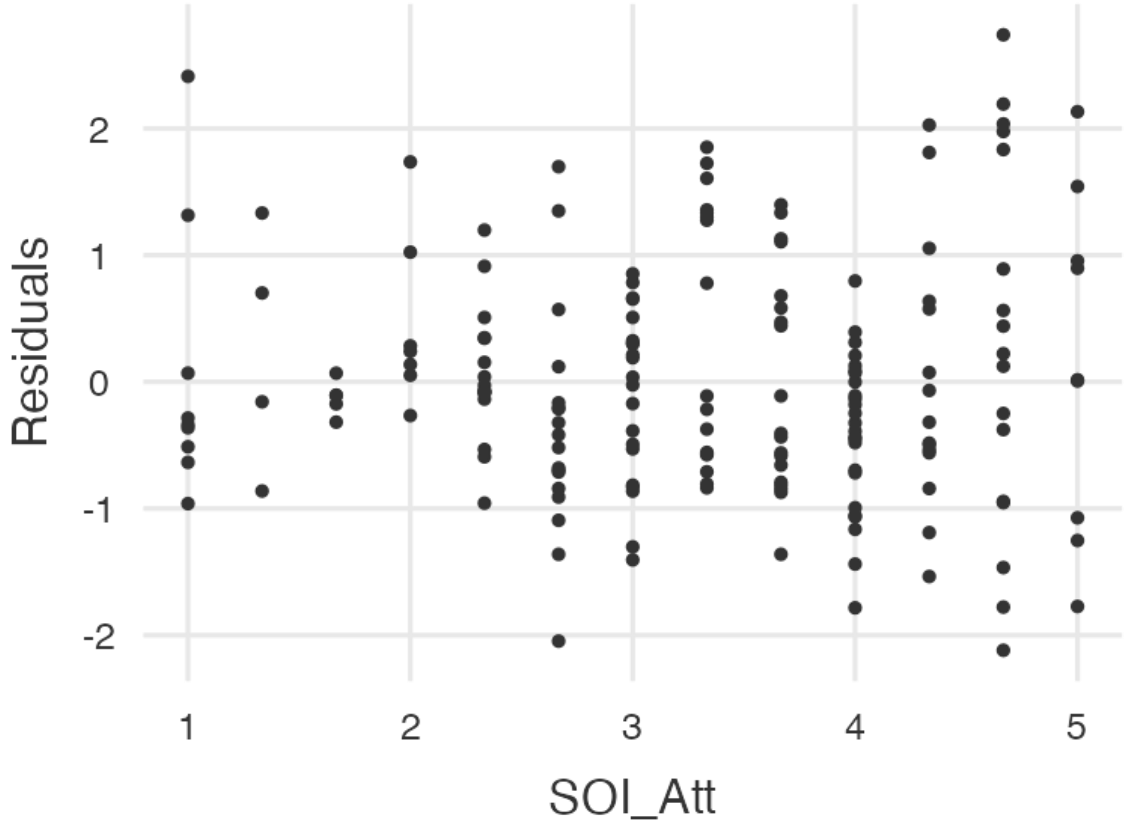
IntentionsInfidelity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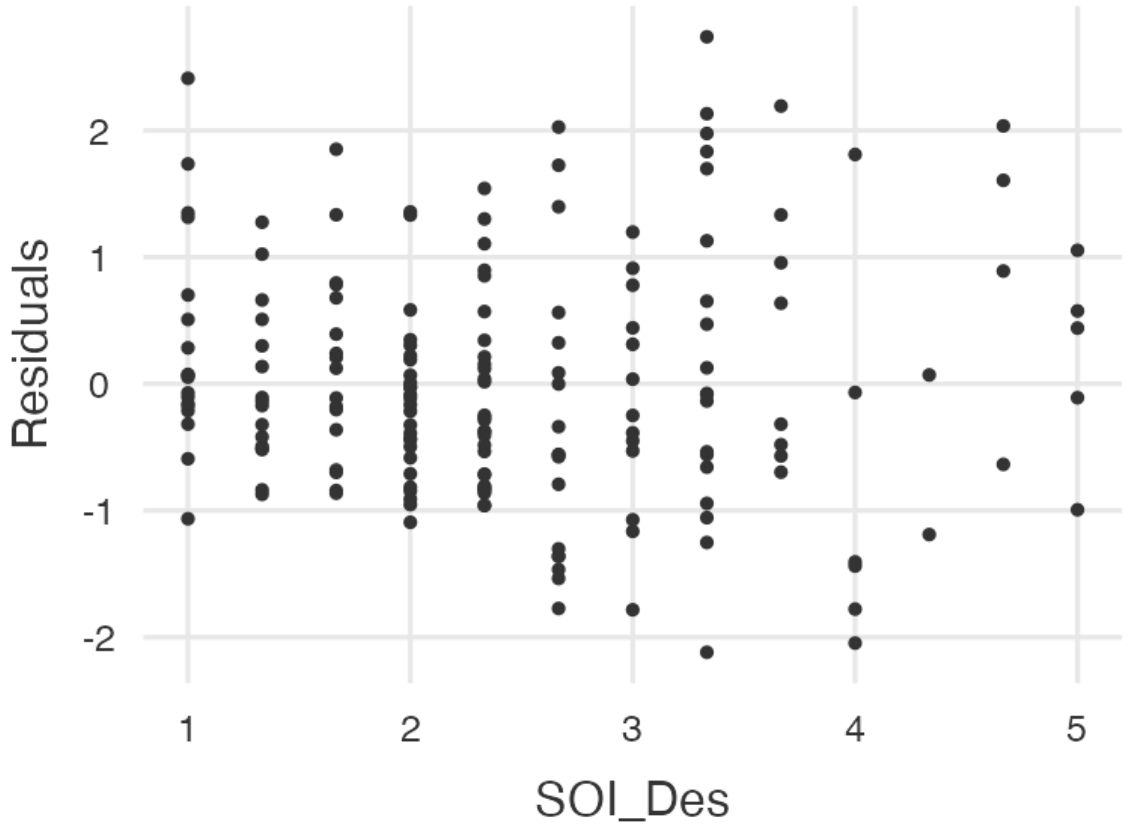
SOI_Att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5
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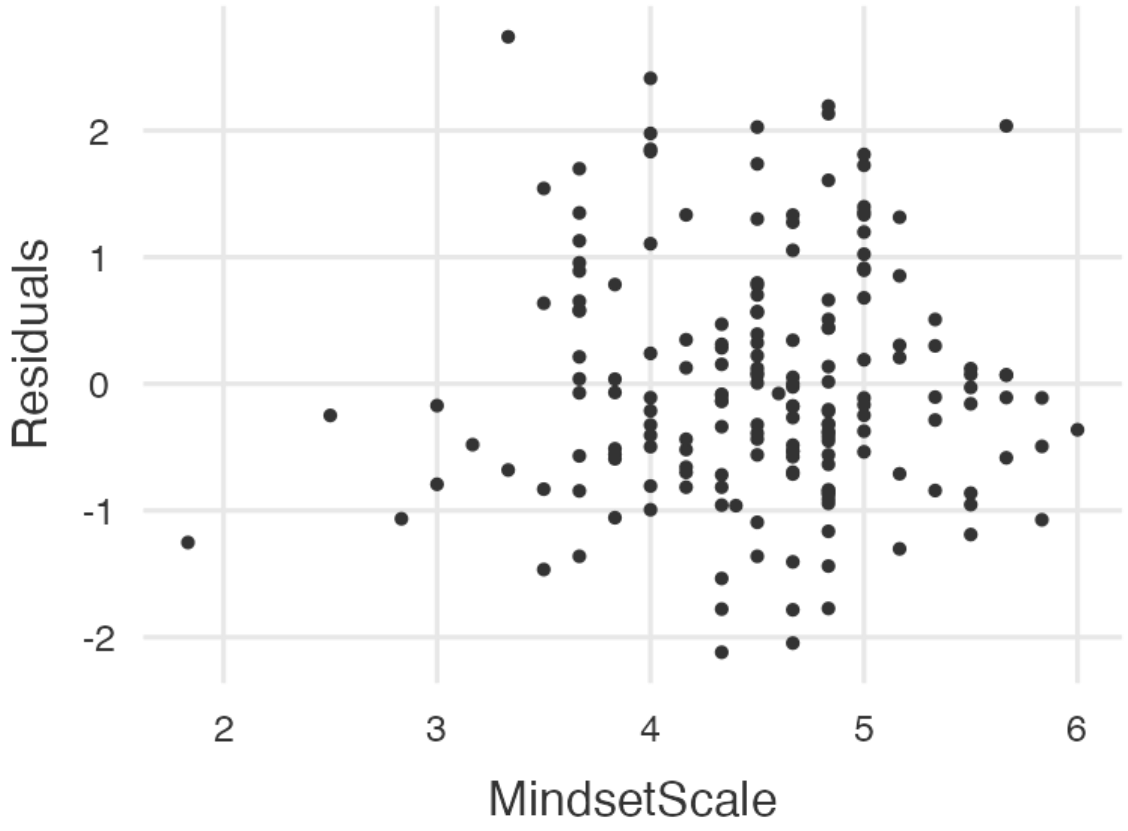
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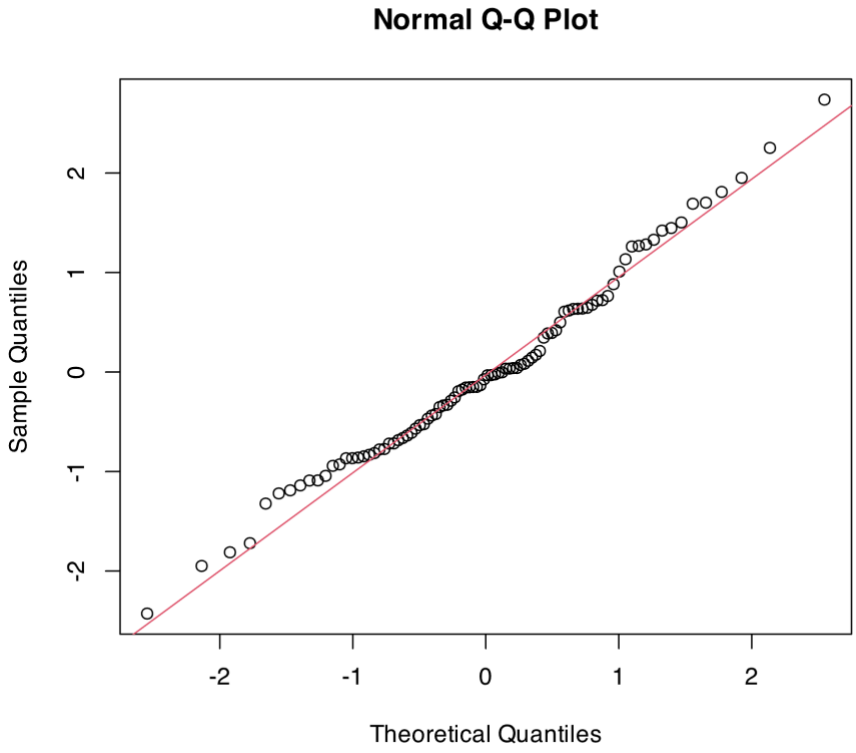
6
MindsetScale

Infidelity Intentions X Attachment



Collinearity Statistics

	VIF	Tolerance
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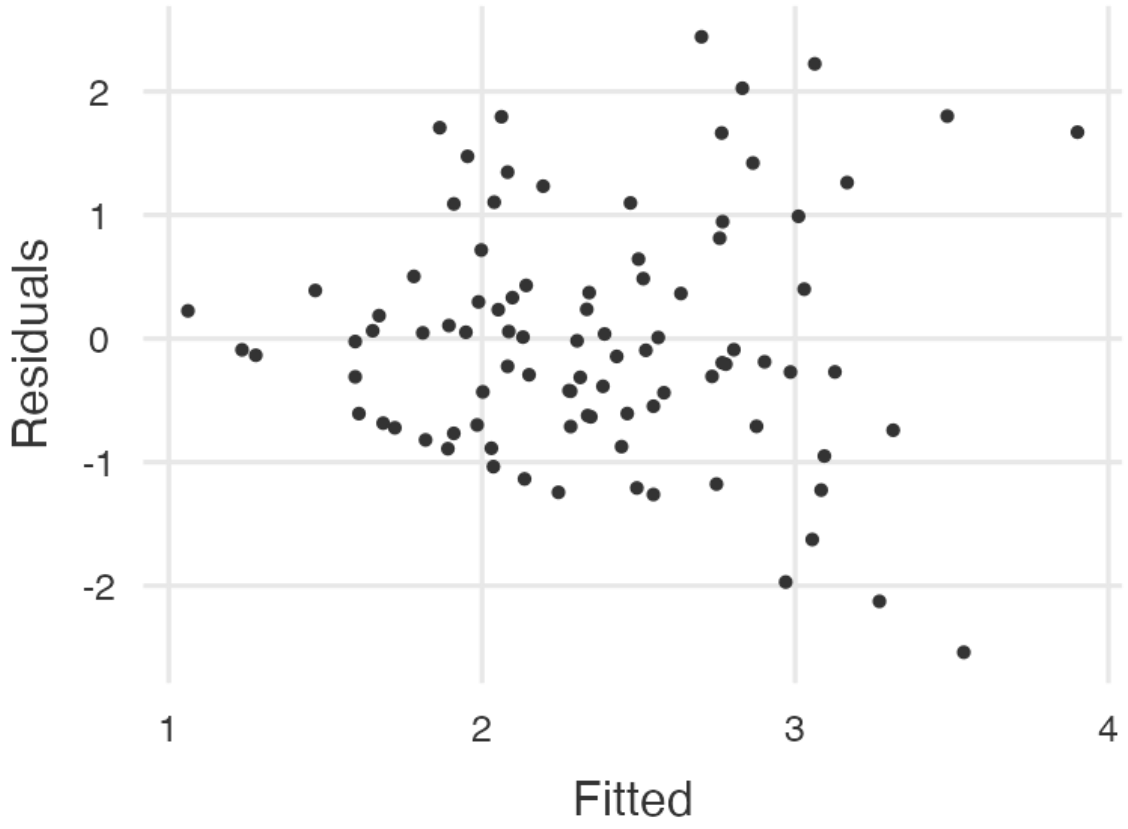
Gender	1.017	0.983
AvoidanceAttachment	1.018	0.982
MindsetScale	1.070	0.934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0
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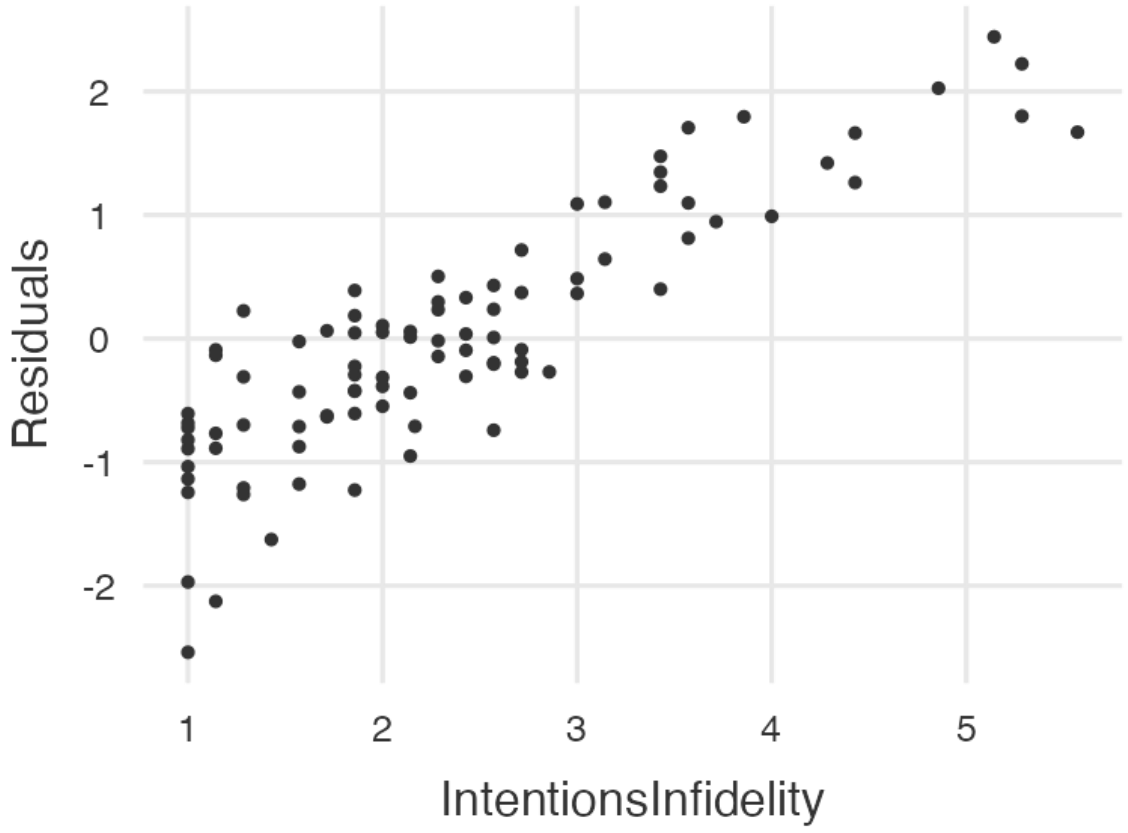
1
2
3
4
Fitted


Residuals
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0
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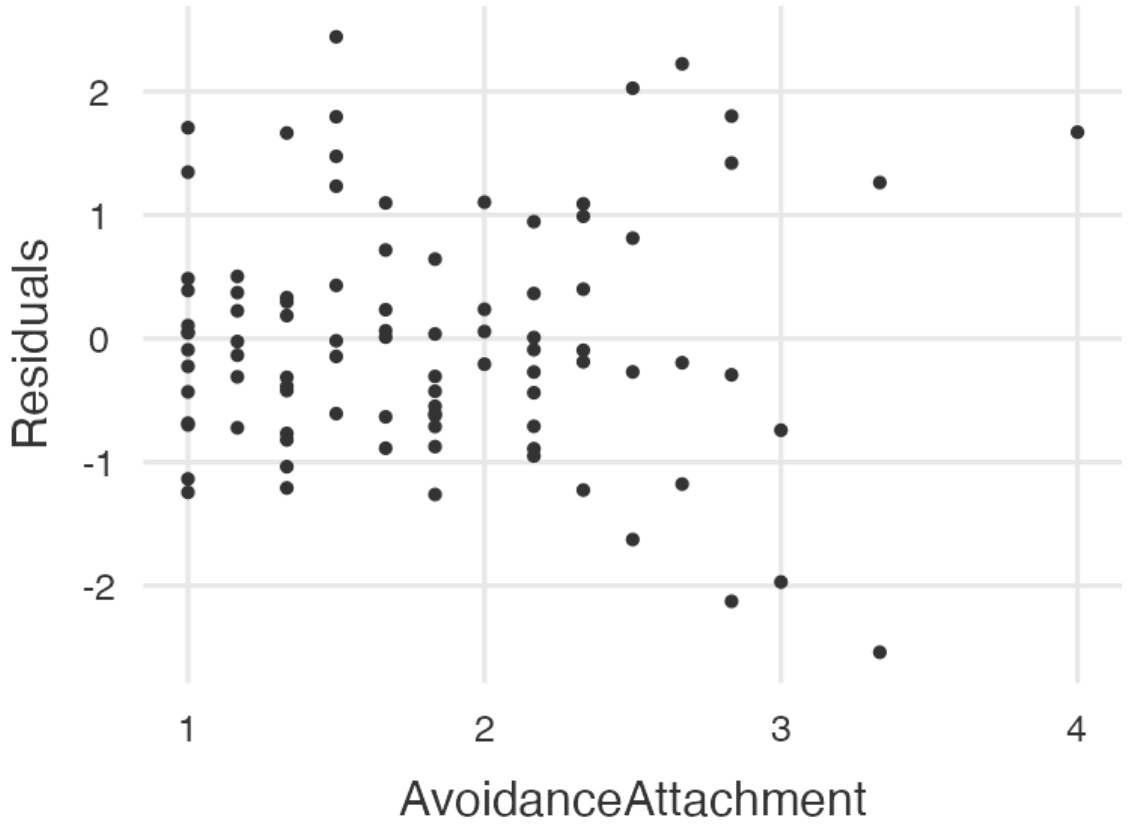
-2
1
2
3
4
5
IntentionsInfidelity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-2
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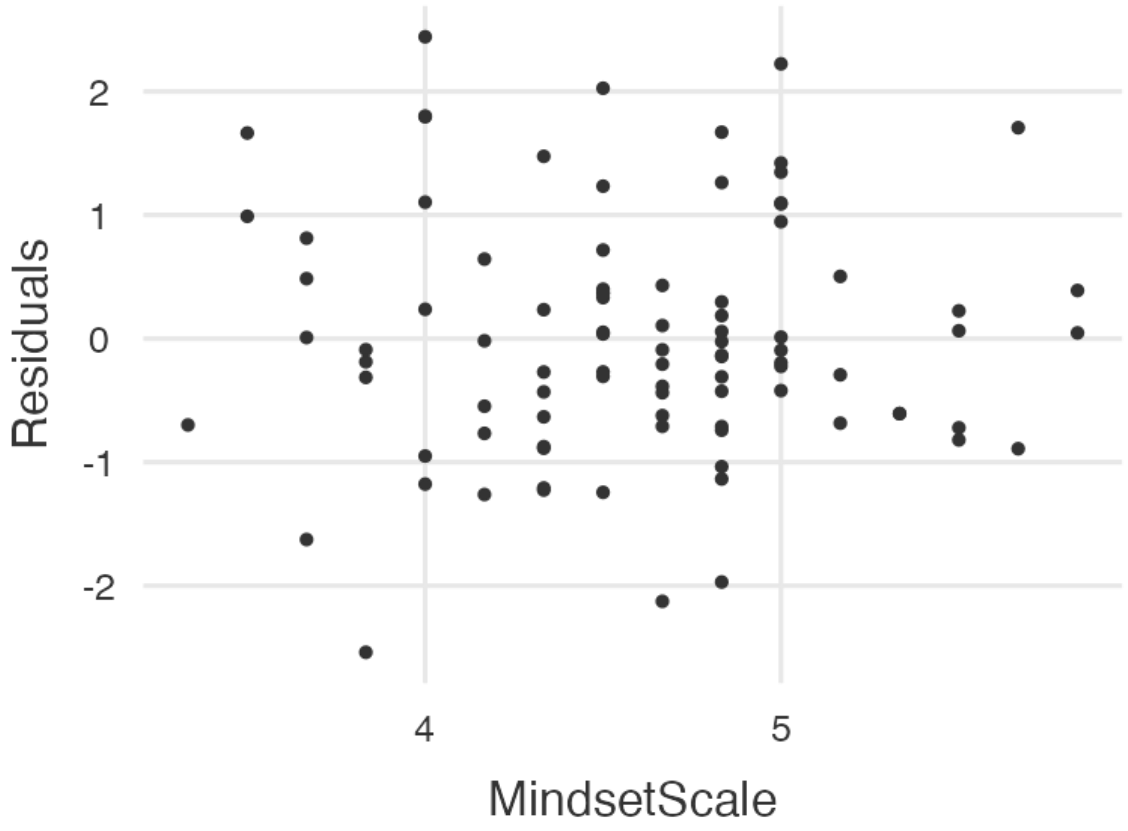
3
4
AvoidanceAttachment


Residuals
2
1
0
-1
-2
4
5
MindsetScale

Qualtrics Questionnaire

Demographics

What gender do you identify with?

- Female
- Male
- Non-binary
- Prefer not to say

What is your sexual orientation?

- Heterosexual
- Homosexual
- Bisexual
- Pansexual
- Asexual
- Prefer not to say

What is your age?
What is your Ethnicity?
What nation were you born in?
What nation do you currently reside in?
What is your religion?
Do any of the following apply to you? Please note you can choose more than one.

- I am single
- I am dating around
- I am in a serious/romantic relationship
- I am divorced/separated
- I am a widow/widower
- I am cohabitating with my partner(s)
- I am engaged to my partner(s)
- I am married and live with my spouse(s)
- I have been in a relationship with my partner(s) for 10 years or longer
- My relationship is monogamous
- None of the above apply to me

Sociosexual Orientation Inventory (SOI-R) (Penke & Asendorpf, 2008).

The following questions will ask you about your past and current practices regarding sexual behaviours and attitudes. We ask you to respond honestly and remember that none of the following information will be able to be linked to your identity.

1. With how many different partners have you had sex within the past 12 months?

□	□	□	□	□
0	1	2 to 3	4 to 7	8 or more

2. With how many different partners have you had sexual intercourse on *one and only one* occasion?

□	□	□	□	□
0	1	2 to 3	4 to 7	8 or more

3. With how many different partners have you had sexual intercourse without having an interest in a long-term committed relationship with this person?

□	□	□	□	□
0	1	2 to 3	4 to 7	8 or more

4. Sex without love is OK.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

5. I can imagine myself being comfortable and enjoying "casual" sex with different partners.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

6. I do *not* want to have sex with a person until I am sure that we will have a long-term, serious relationship.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

7. How often do you have fantasies about having sex with someone you are *not* in a committed romantic relationship with?

1 □	2 □	3 □	4 □	5 □
Never	Very seldom	About once a month	About once a week	Nearly every day

8. How often do you experience sexual arousal when you are in contact with someone you are *not* in a committed romantic relationship with?

1 □	2 □	3 □	4 □	5 □
Never	Very seldom	About once a month	About once a week	Nearly every day

9. In everyday life, how often do you have spontaneous fantasies about having sex with someone you have just met?

1 □	2 □	3 □	4 □	5 □
Never	Very seldom	About once a month	About once a week	Nearly every day

Experience in Close Relationships Scale – Short Form (ECR-S):

The following statements concern how you feel in romantic relationships. Please respond to each statement by indicating how much you agree or disagree.

1. It helps to turn to my romantic partner in times of need.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

2. I need a lot of reassurance that I am loved by my partner.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

3. I want to get close to my partner, but I keep pulling back.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

4. I find that my partner doesn't want to get as close as I would like.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

5. I turn to my partner for many things, including comfort and reassurance.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

6. My desire to be very close sometimes scares people away.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

7. I try to avoid getting too close to my partner.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

8. I don't worry about being abandoned.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

9. I usually discuss my problems and concerns with my partner.

1 □	2 □	3 □	4 □	5 □
Strongly disagree				Strongly agree

10. I get frustrated if my romantic partner is not available when I need them.

1 □ 2 □ 3 □ 4 □ 5 □

Strongly disagree Strongly agree

11. I am nervous when my partner gets too close to me.

1 □ 2 □ 3 □ 4 □ 5 □

Strongly disagree Strongly agree

12. I worry that a romantic partner won't care about me as much as I care about them.

1 □ 2 □ 3 □ 4 □ 5 □

Strongly disagree Strongly agree

Ten-Item Personality Inventory (TIPI) (Gosling, Rentfrow, & Swann, 2003)

Here are a number of personality traits that may or may not apply to you. Please select a number next to each statement to indicate the extent to which you agree or disagree with that statement. You should rate to what extent each pair of traits applies to you, even if one characteristic applies more strongly than the other.

Disagree strongly	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Agree strongly
1	2	3	4	5	6	7

1. Extraverted, enthusiastic
2. Critical, quarrelsome
3. Dependable, self-disciplined
4. Anxious, easily upset
5. Open to new experiences, complex
6. Reserved, quiet
7. Sympathetic, warm
8. Disorganized, careless
9. Calm, emotionally stable
10. Conventional, uncreative

Attitudes Toward Infidelity Scale (Whatley, 2006)

The following statements relate to attitudes towards sexual behaviours. Please read the following statements and rate to what extent you agree or disagree.

Extremely disagree	Disagree moderately	Disagree a little	Neither agree nor disagree	Agree a little	Agree moderately	Extremely agree
1	2	3	4	5	6	7

1. Being unfaithful never hurt anyone.
2. Infidelity in a marital relationship is grounds for divorce.
3. Infidelity is acceptable for retaliation of infidelity.
4. It is natural for people to be unfaithful.
5. Online/internet behaviour (e.g., sex chat room, porn sites) is an act of infidelity.
6. Infidelity is morally wrong in all circumstances regardless of the situation.
7. Being unfaithful in a relationship is one of the most dishonourable things a person can do.
8. Infidelity is unacceptable under any circumstances if the couple is married.
9. I would not mind if my significant other had an affair as long as I did not know about it.
10. It would be acceptable for me to have an affair, but not my significant other.
11. I would have an affair if I knew my significant other would never find out.
12. If I knew my significant other was guilty of infidelity, I would confront them.

Tight-Loose Mindset (Gelfand et al., 2011)

Please read the statements below and reflect to see how accurately each statement applies to your own mindset.

Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6

1. I abide by the social norms that are present in the country that I currently reside in.

2. I reflect on things before acting.

3. I keep my emotions under control.

4. I stick to the rules.

5. I talk even when I know I shouldn't.

6. In social situations, I have the ability to alter my behaviour if I feel that something else is called for.

Intentions Toward Infidelity Scale (Fisher, Davis, Yarber, 2011)

Please indicate how likely or unlikely you would be to do the following things. Use the scale below to express your answer.

Not at all likely						Extremely likely
-3	-2	-1	0	+1	+2	+3

1. How likely are you to be unfaithful to a partner if you knew you wouldn't get caught?
2. How likely would you be to a lie to a partner about being unfaithful?
3. How likely would you be to tell a partner if you were unfaithful?
4. How likely do you think you would be to get away with being unfaithful to a partner?
5. How likely would you be to hide your relationship from an attractive person you just met?
6. How likely do you think you are to be unfaithful to future partners?
7. How likely do you think you are to be unfaithful to your present or future husband or wife?

Appendix B

Table 1
Breakdown of participant demographics split by gender. N = 267.

Frequencies of Demographics: Split by Gender

	Gender			
	Female	Male	Non-Binary / Third Gender	Prefer not to say
Gender	174	85	7	1
Sexual Orientation				
Heterosexual	134	66	0	0
Bisexual	26	5	3	0
Gay/Lesbian	5	9	1	0
Pansexual	4	0	3	0
Asexual	0	1	0	0
Prefer not to say	5	4	0	1
Age Group				
18-24	87	26	2	1
25-34	56	24	3	0
35-44	16	14	2	0
45-54	11	12	0	0
55-64	2	3	0	0

65-74	2	6	0	0
Religion				
Agnostic	31	18	1	0
Atheist	39	24	3	0
Buddhist	6	4	0	1
Catholic	14	6	0	0
Christian	41	18	2	0
Hindu	11	2	0	0
Islamic	15	8	0	0
Sikh	2	1	0	0
Other	14	4	1	0
World Regions				
Western Europe	113	55	3	0
North America	35	18	4	0
Southeast Asia	13	7	0	1
Other	13	4	0	0

Qualtrics Questionnaire

· What gender do you identify with?
- o Female
- o Male
- o Non-binary
- o Prefer not to say

· What is your sexual orientation?
- o Heterosexual
- o Gay or Lesbian
- o Bisexual
- o Pansexual
- o Asexual
- o Prefer not to say

· What is your age?

· What is your Ethnicity?

· What nation were you born in?

· What nation do you currently reside in?

· What is your religion?

· Which of the following best explains the area for where you were raised?

- o Urban environment
- o Suburban environment
- o Rural environment

· Which of the following best explains the type of sexual education program you received throughout primary and/or secondary school:
  - § Abstinence-Focused Education: Focuses on teaching students not to have sex outside of marriage. Often excludes birth control and safe sex practices.
  - § Comprehensive Education: Includes the teachings of birth control, safe sex practices, and non-heterosexual identities.
- o Abstinence-focused sex education
- o Comprehensive sex education
- o I did not receive a sex education course in primary or secondary school

Qualitative Item: Do you believe that medically accurate sex education and STD prevention interventions could improve a person's mental health and well-being? Explain your reasoning in a few short sentences.

Appendix C

Table 1. Measuring Mindset: Original & Modified Questionnaire

Item Number	Item description:	M	SD	Item-total correlations
1	There are many social norms that people are supposed to abide by in this country. *I abide by the social norms that are present in the country that I currently reside in.*	3.1	.65	.57***
2	In this country, there are very clear expectations for how people should act in most situations. *I reflect on things before acting.*	3.2	.57	.51***
3	People agree upon what behaviors are appropriate versus inappropriate in most situations in this country. *I keep my emotions under control*	3.0	.70	.63***
4	People in this country have a great deal of freedom in deciding how they want to behave in most situations. (R) *I stick to the rules.*	2.9	.67	.66***
5	In this country, if someone acts in an inappropriate way, others will strongly disapprove. *I talk even when I know I shouldn't. (R)*	2.6	.73	.50***
6	People in this country almost always comply with social norms. *In social situations, I have the ability to alter my behavior if I feel that something else is called for.*	3.2	.58	.24**

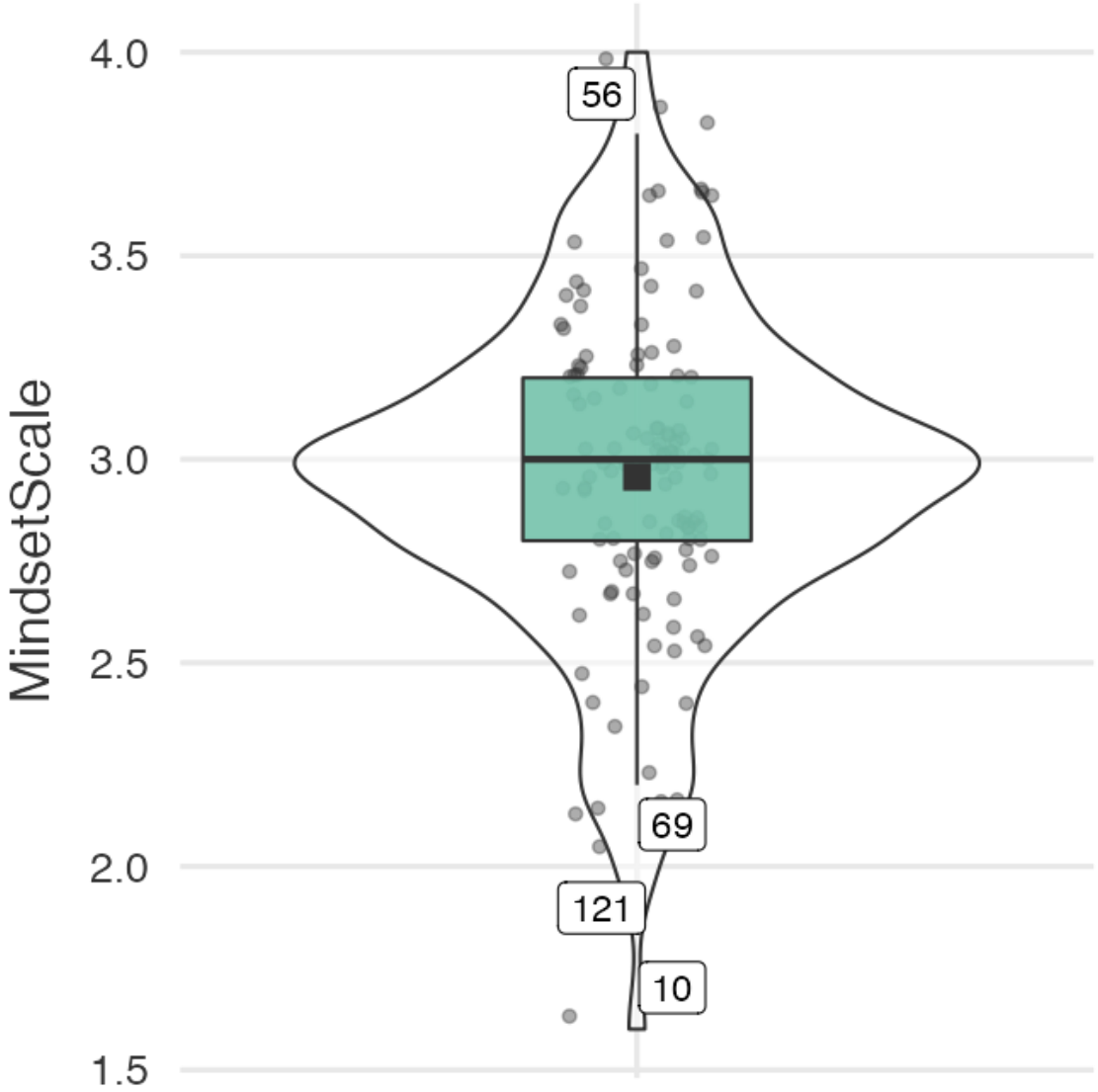
R indicates reverse coded item; *italicized* is the modified version
P < .001 indicated by ***, p<.01 **

Table 2. *Linear mixed-effect analysis of standardized HEART program outcomes.*

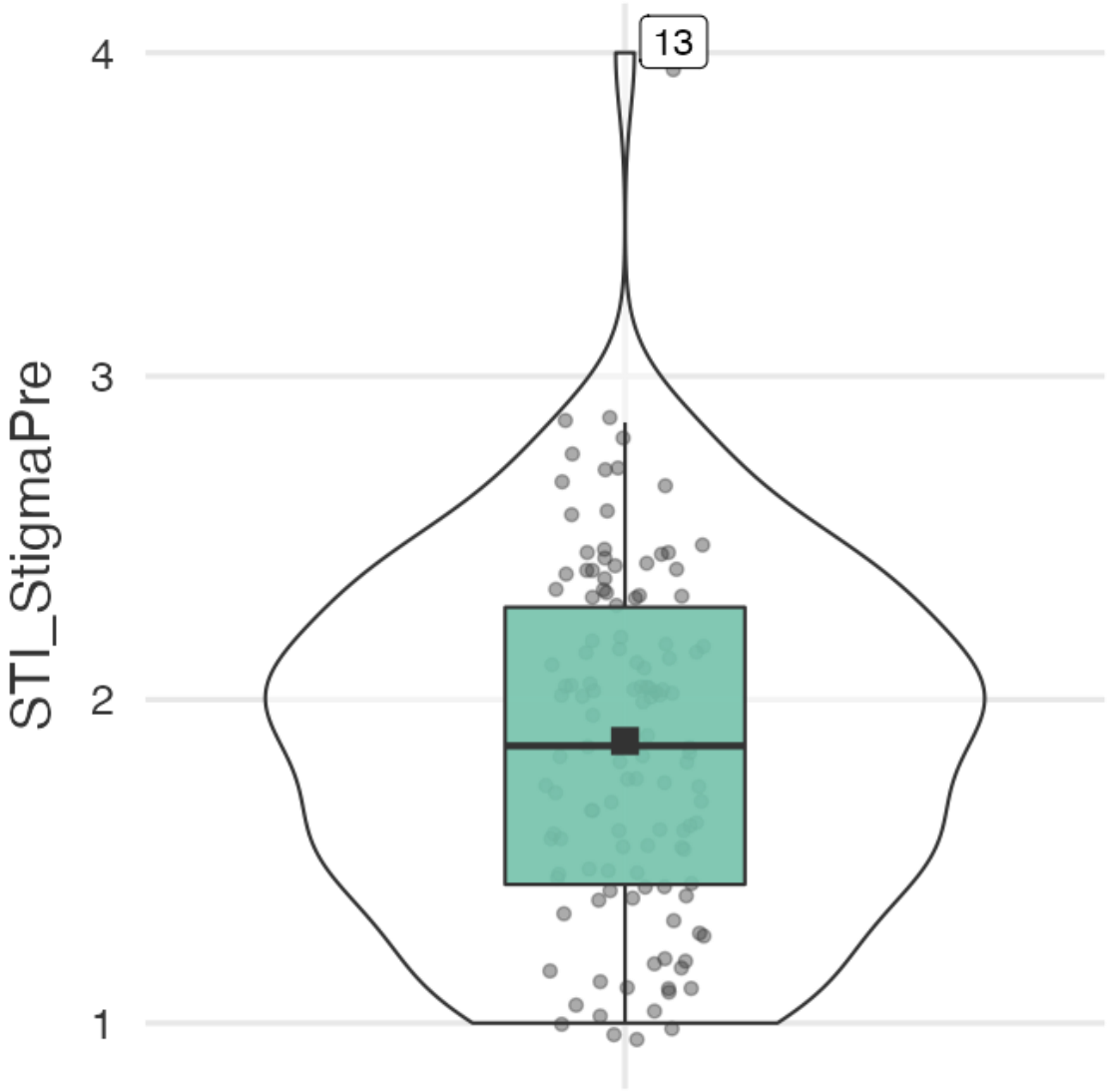
Factor	*b*	SE	t	*df*	*p*
STI-Related Shame					
Intercept (Time)	**3.00**	**0.05**	**55.54**	**163.94**	**<.001**
Intercept (Mindset * Time)	0.00	0.00	0.00	0.00	0.997
Mindset	0.00	0.00	0.31	0.00	0.757
Time 2	**-0.31**	**0.05**	**-6.96**	**188.92**	**<.001**
Time 3	**-0.39**	**0.05**	**-8.36**	**189.90**	**<.001**
Mindset * Time 2	0.00	0.00	-0.96	0.00	0.337
Mindset * Time 3	0.00	0.00	-0.35	0.00	0.728
STI-Related Stigma					
Intercept (Time)	**1.87**	**0.05**	**40.66**	**153.98**	**<.001**
Intercept (Mindset * Time)	0.00	0.00	-0.01	0.00	0.995
Mindset	0.00	0.00	0.31	0.00	0.757
Time 2	-0.06	0.03	-1.89	188.55	0.060
Time 3	-0.06	0.04	-1.74	189.20	0.083
Mindset * Time 2	0.00	0.00	0.67	0.00	0.507
Mindset * Time 3	0.00	0.00	0.99	0.00	0.325
Sexual Self-Efficacy					
Intercept (Time)	**3.45**	**0.05**	**70.84**	**167.55**	**<.001**
Intercept (Mindset * Time)	0.00	0.05	0.03	168.32	0.980
Mindset	0.24	0.12	1.93	186.32	0.055
Time 2	**0.24**	**0.04**	**5.57**	**187.34**	**<.001**
Time 3	**0.19**	**0.04**	**4.14**	**188.52**	**<.001**
Mindset * Time 2	0.03	0.10	0.25	181.46	0.800
Mindset * Time 3	0.11	0.11	0.98	183.38	0.329
Comfort with Sexuality					
Intercept (Time)	**2.98**	**0.05**	**61.40**	**160.52**	**<.001**
Intercept (Mindset * Time)	-0.00	0.05	-0.03	158.03	0.978
Mindset	**-0.26**	**0.12**	**-2.11**	**158.03**	**0.037**
Time 2	**0.18**	**0.04**	**4.63**	**190.33**	**<.001**
Time 3	**0.14**	**0.04**	**3.52**	**191.13**	**<.001**
Mindset * Time 2	**0.22**	**0.09**	**2.38**	**184.75**	**0.019**
Mindset * Time 3	**0.20**	**0.10**	**2.11**	**186.03**	**0.037**
Sex-Related Guilt					
Intercept (Time)	**2.03**	**0.03**	**61.23**	**153.20**	**<.001**
Intercept (Mindset * Time)	0.00	0.00	0.02	0.00	-0.981
Mindset	0.00	0.00	1.77	0.00	0.079
Time 2	-0.02	0.02	-0.70	190.10	0.487
Time 3	0.00	0.02	0.09	190.66	0.932
Mindset * Time 2	0.00	0.00	-0.74	0.00	0.461
Mindset * Time 3	0.00	0.00	-1.05	0.00	0.298

Bold signifies statistical significance.

Assumption Checks –
Outliers for Mindset Scale:



STI-Related Stigma (Time 1)



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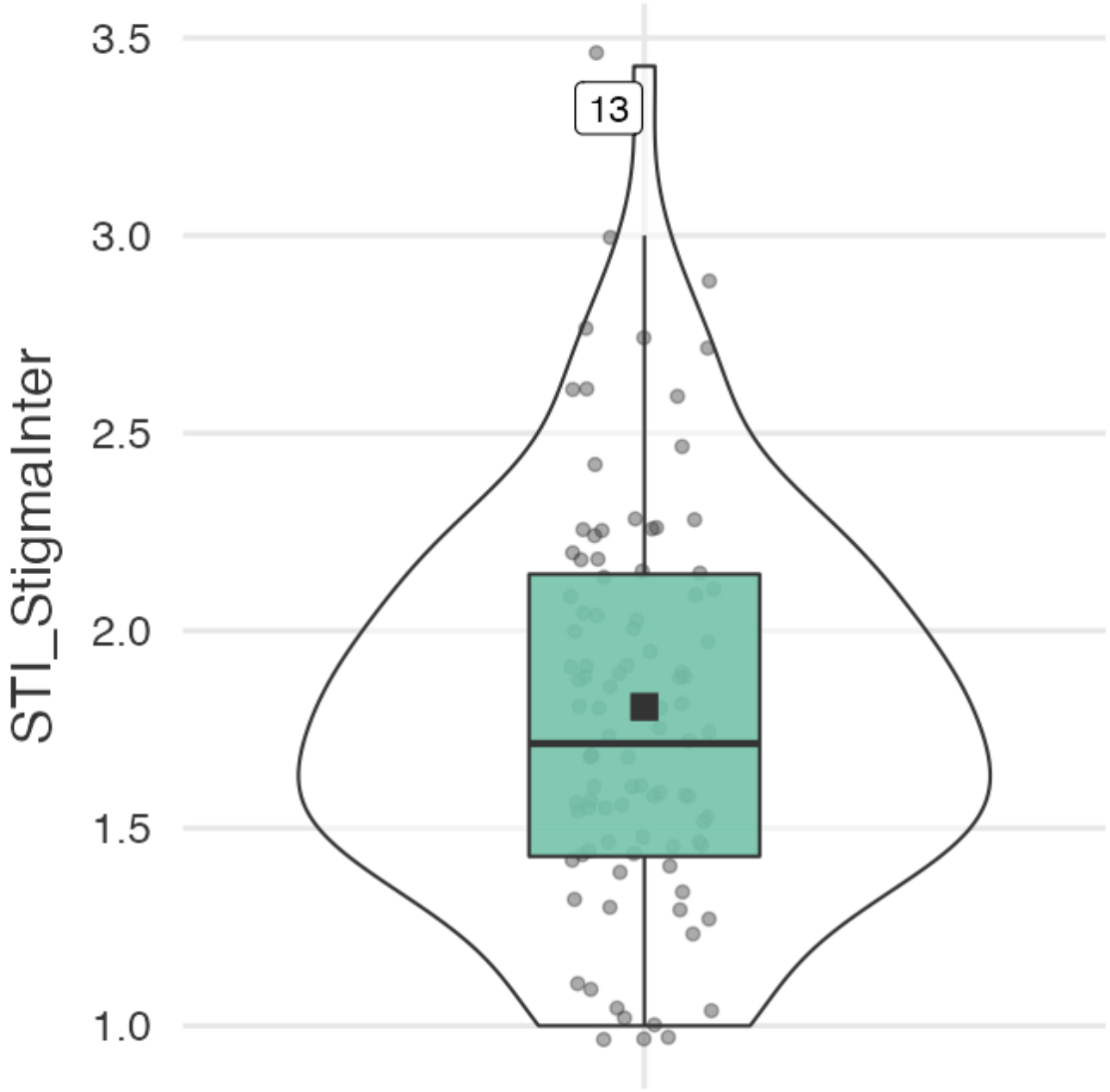

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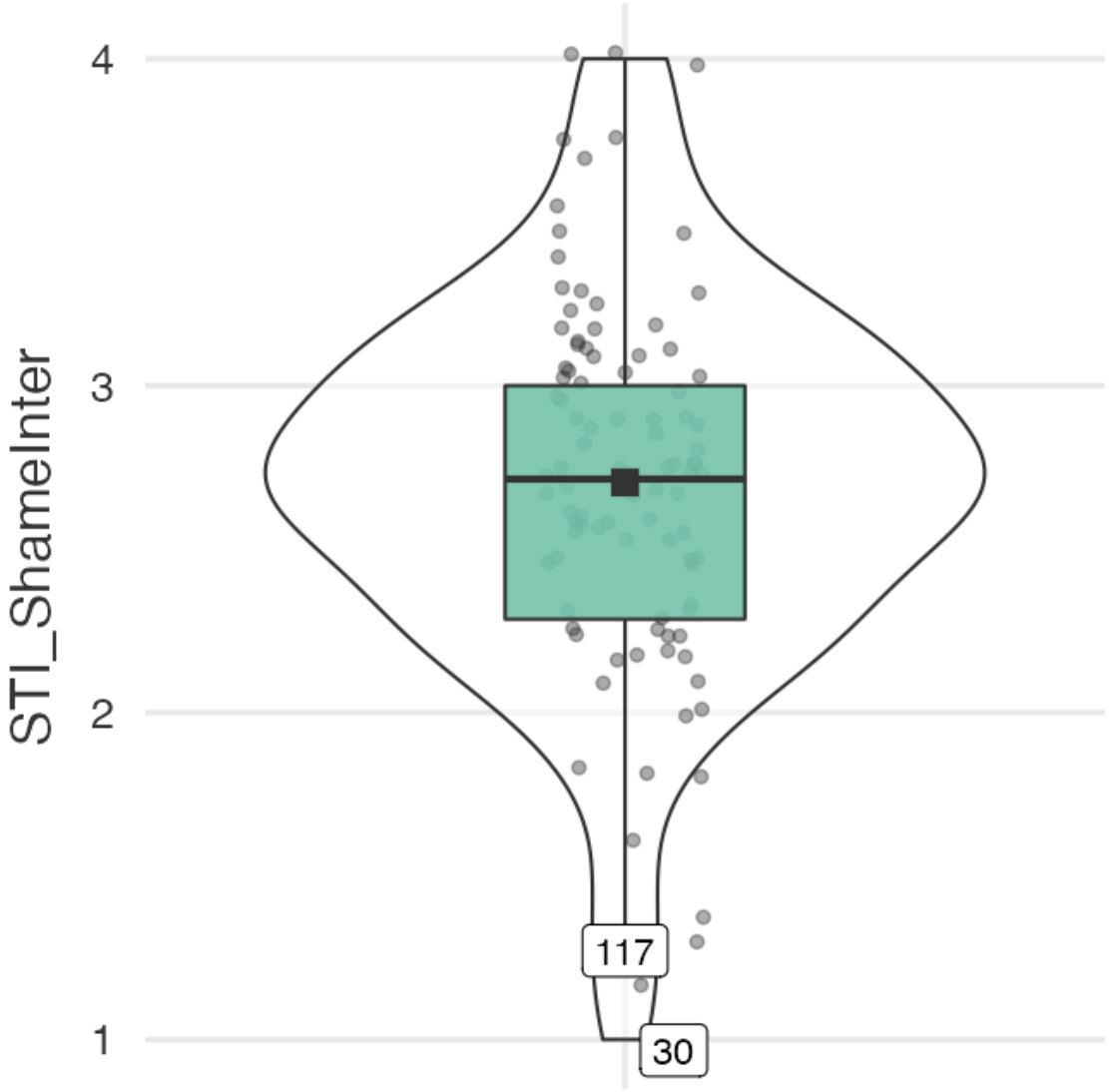
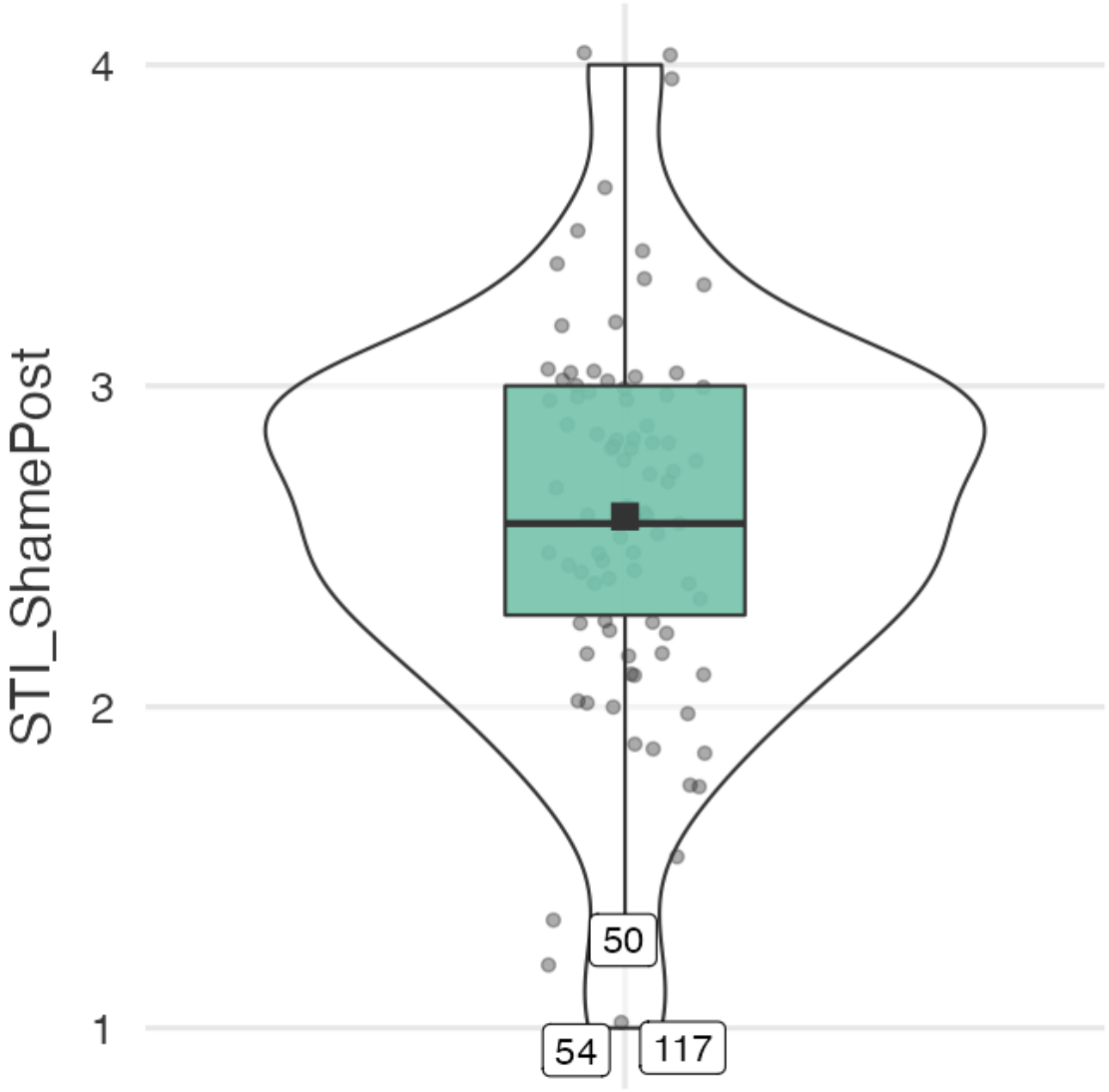
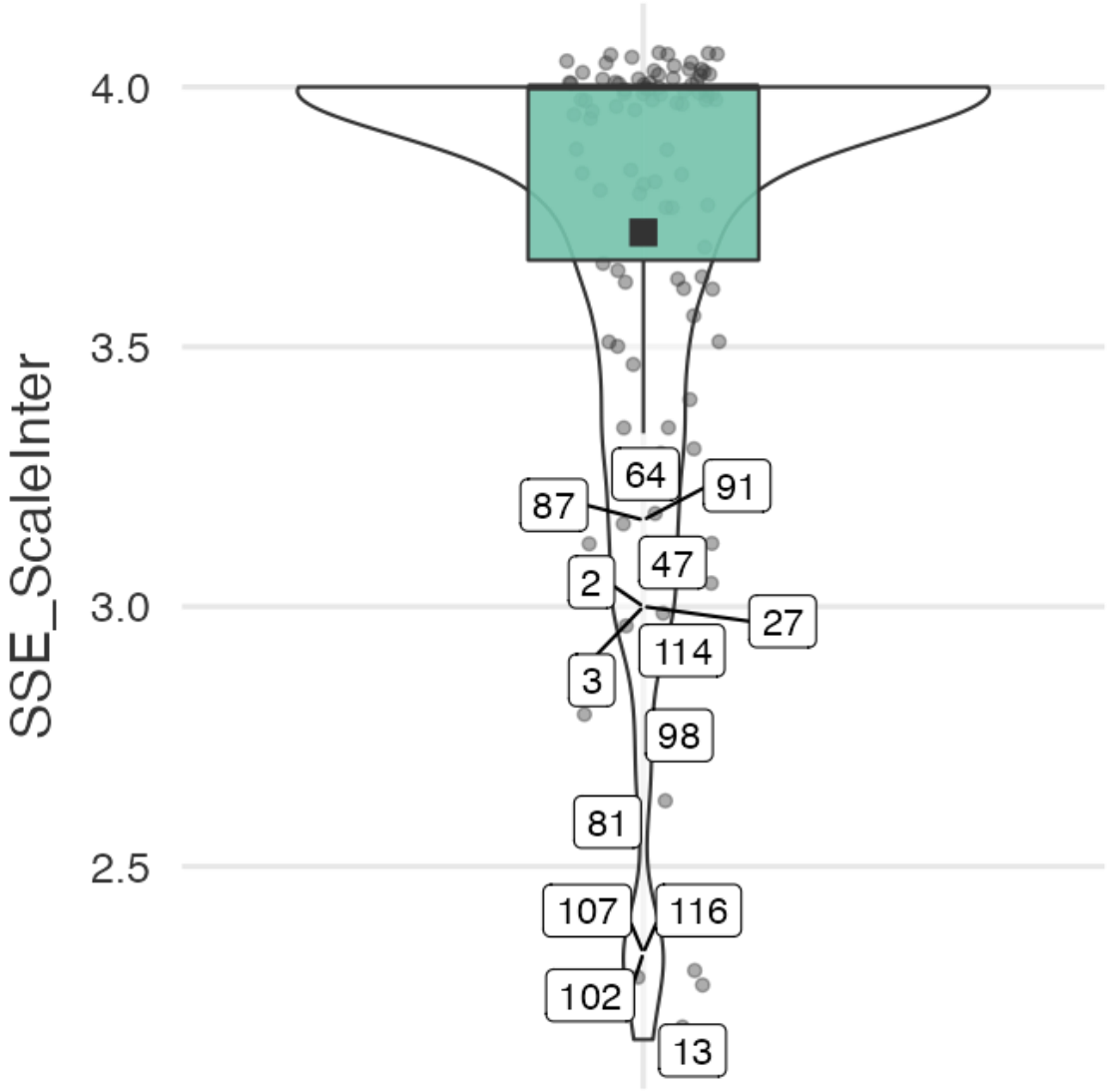


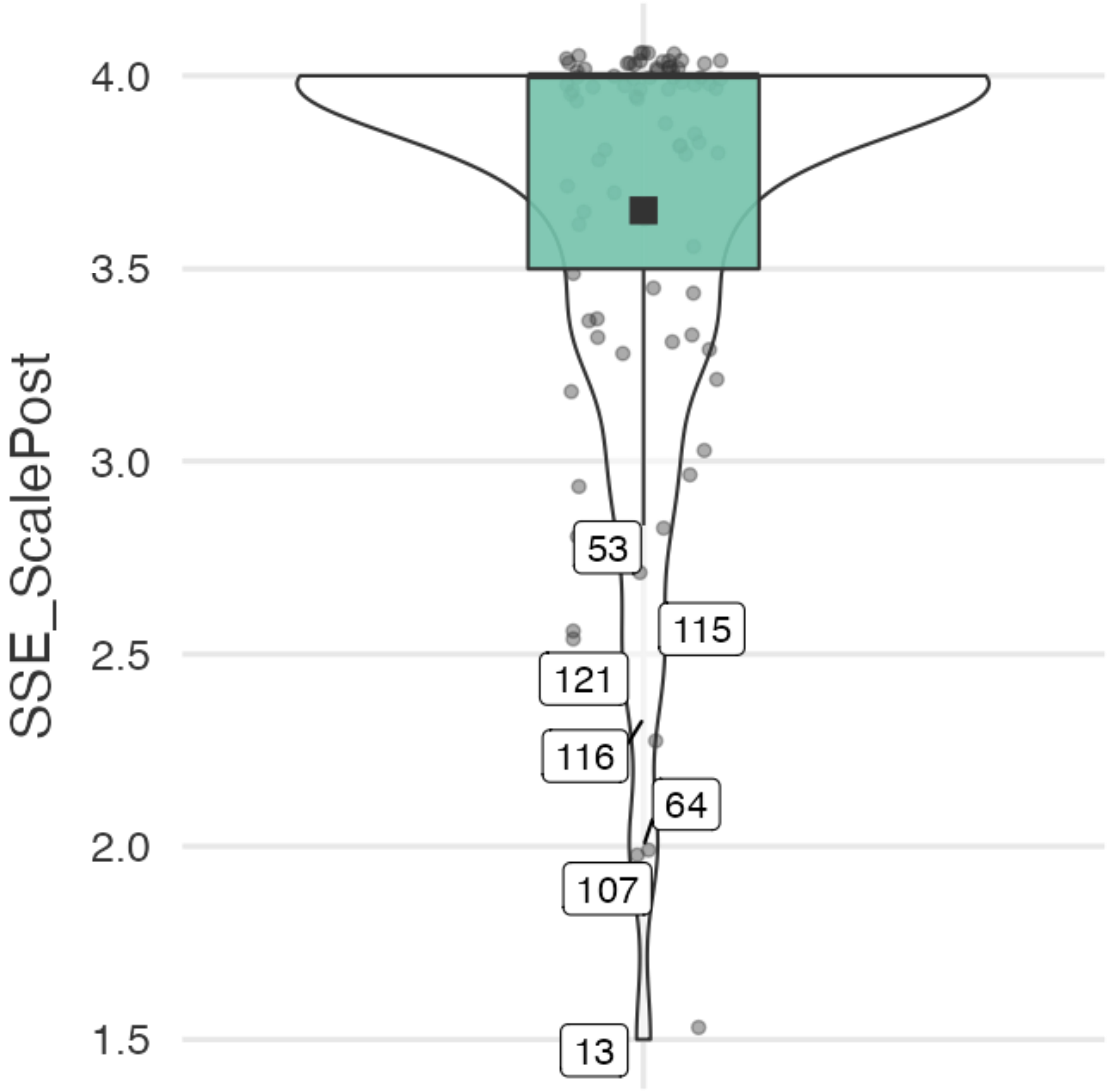
STI-Related Shame (Time 3)



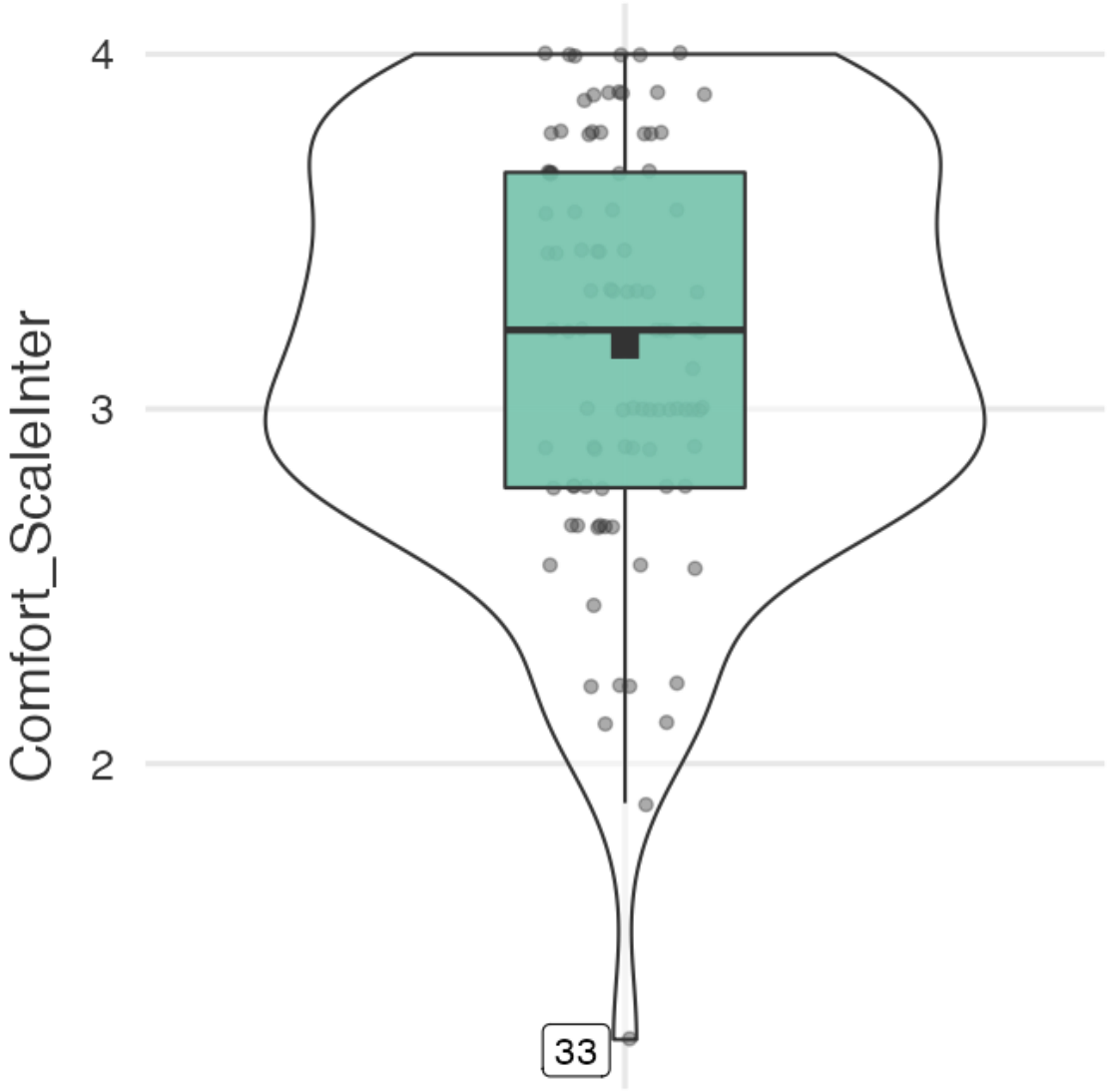
Sexual Self-Efficacy (Time 2)



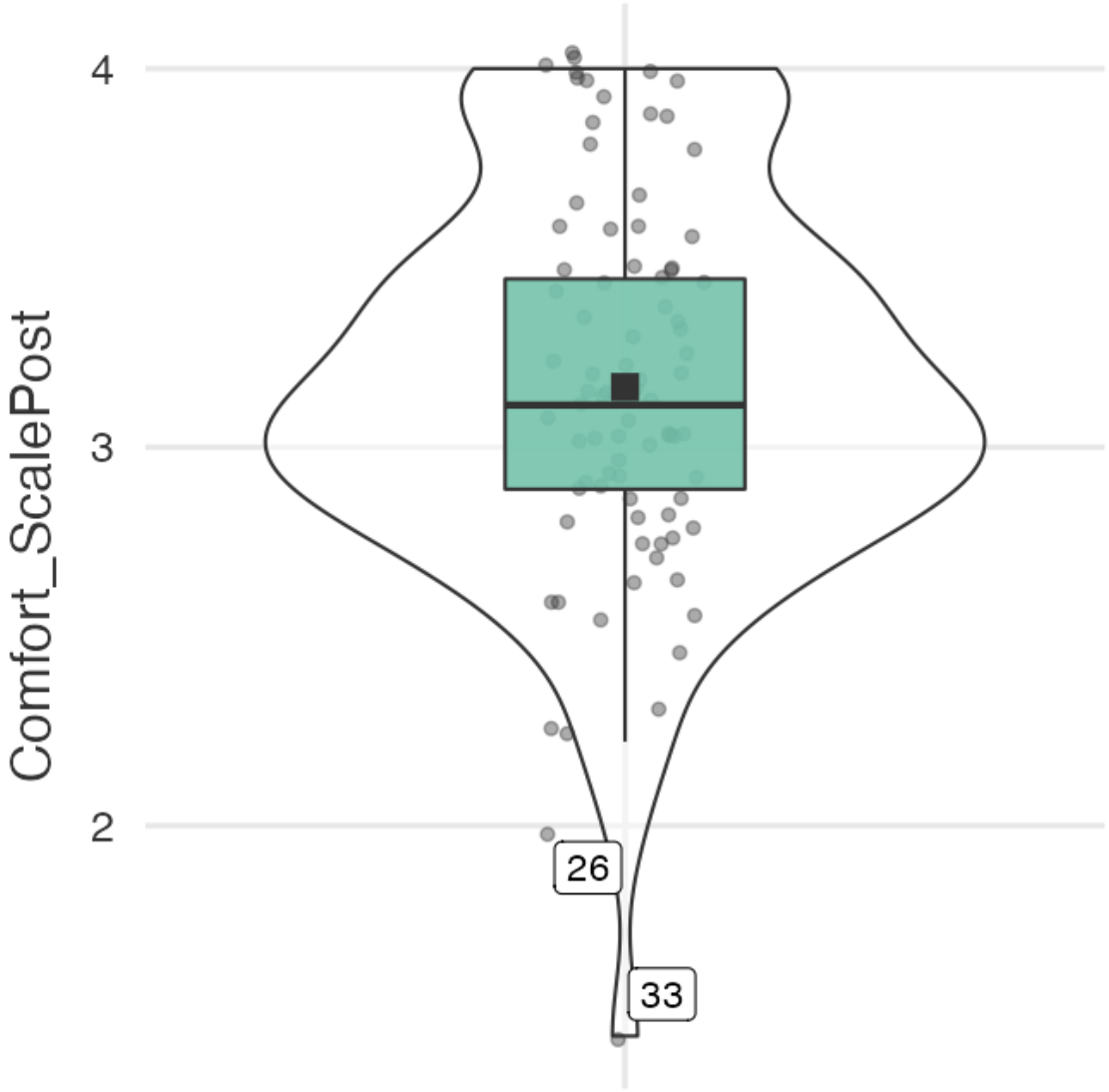
Sexual Self-Efficacy (Time 3)



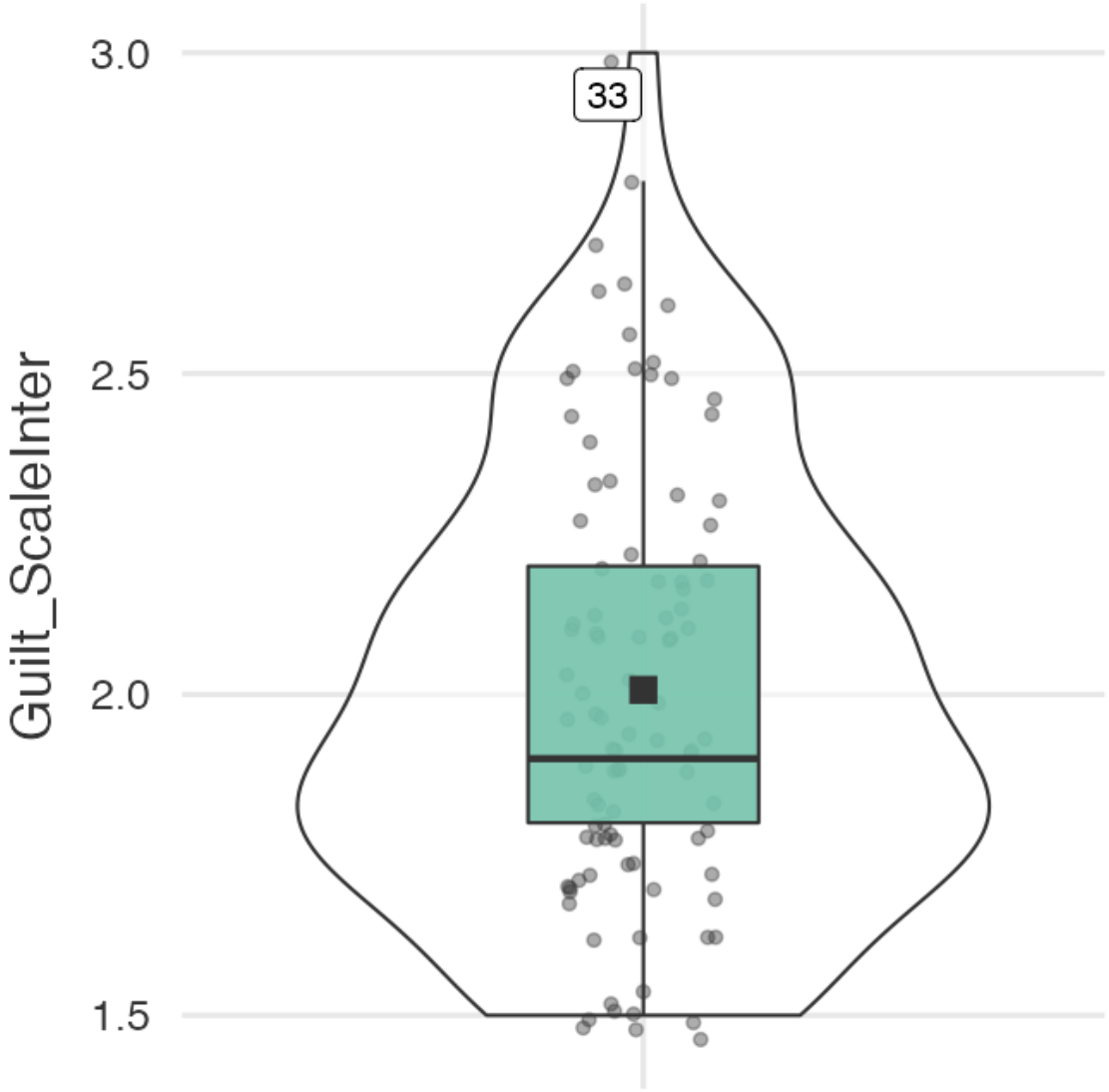
Comfort with Sexuality (Time 2)



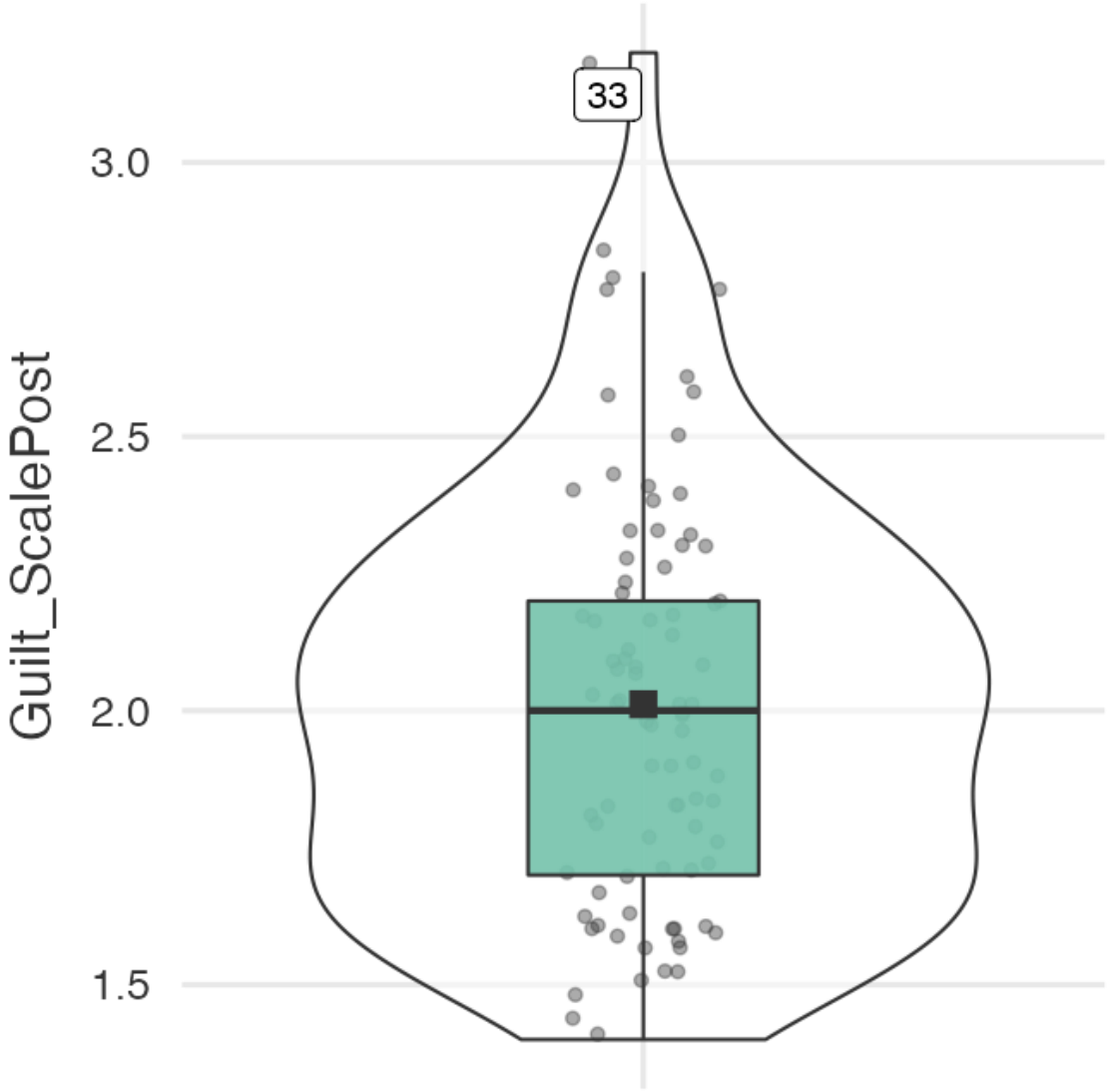
Comfort with Sexuality (Time 3)



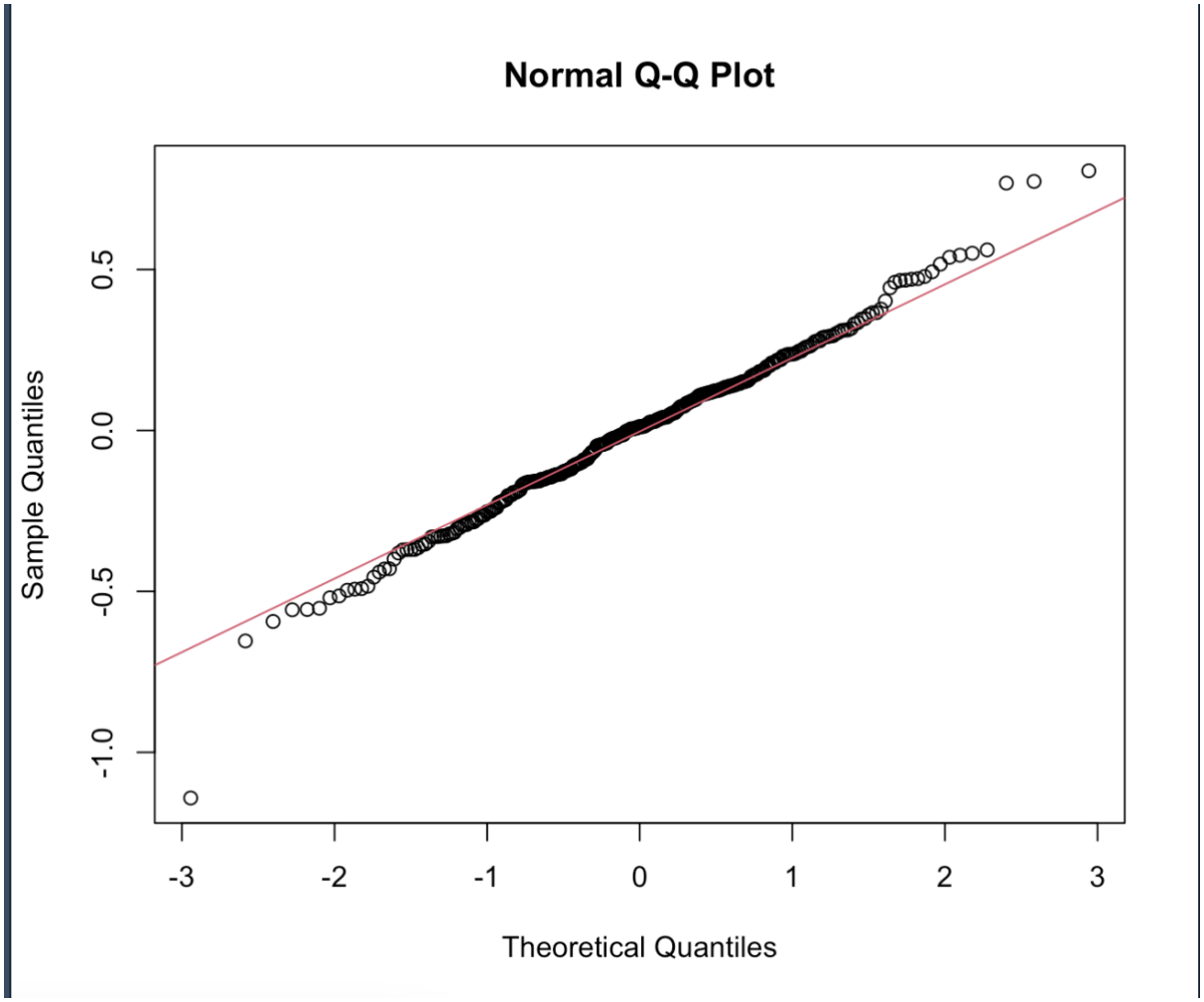
Sex Related Guilt (Time 2)



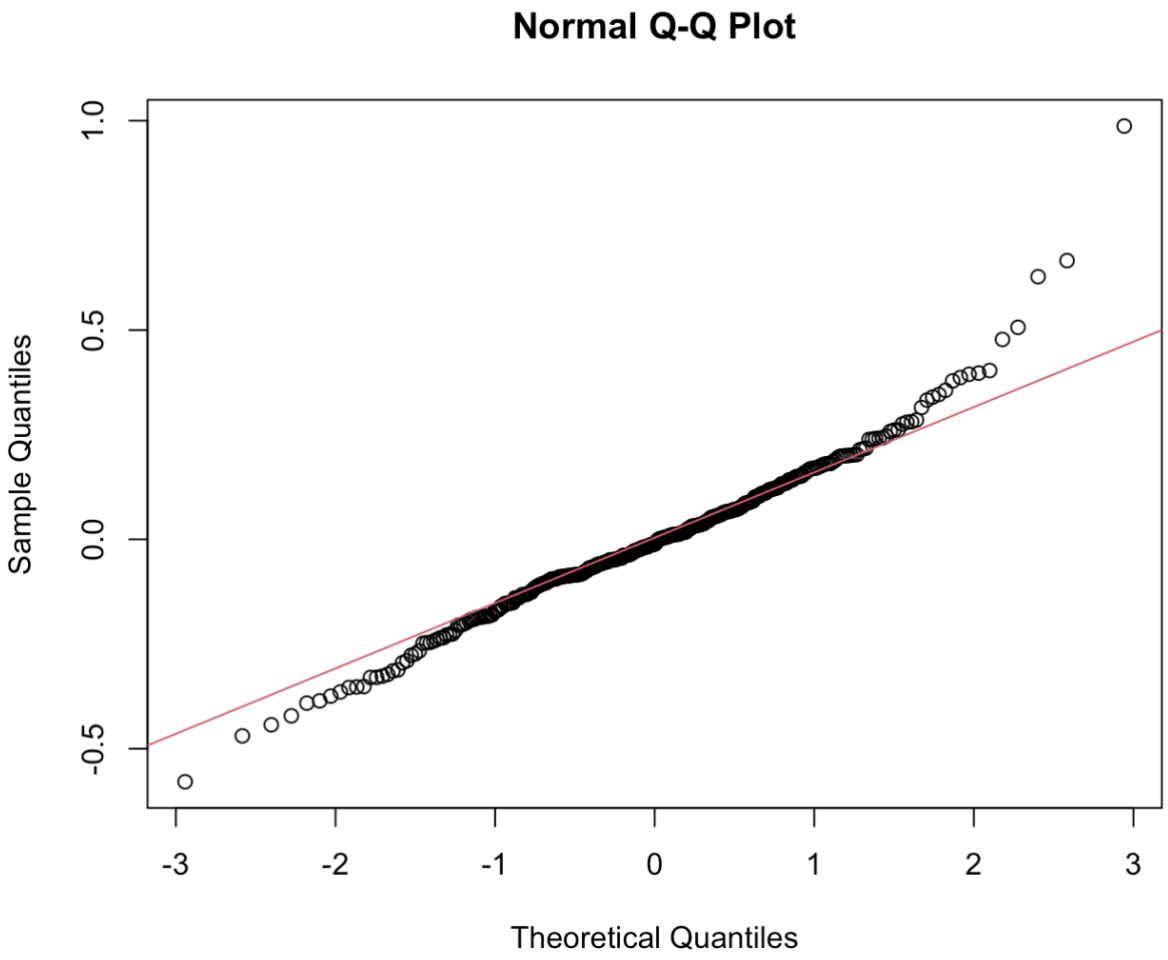
Sex-Related Guilt (Time 3)



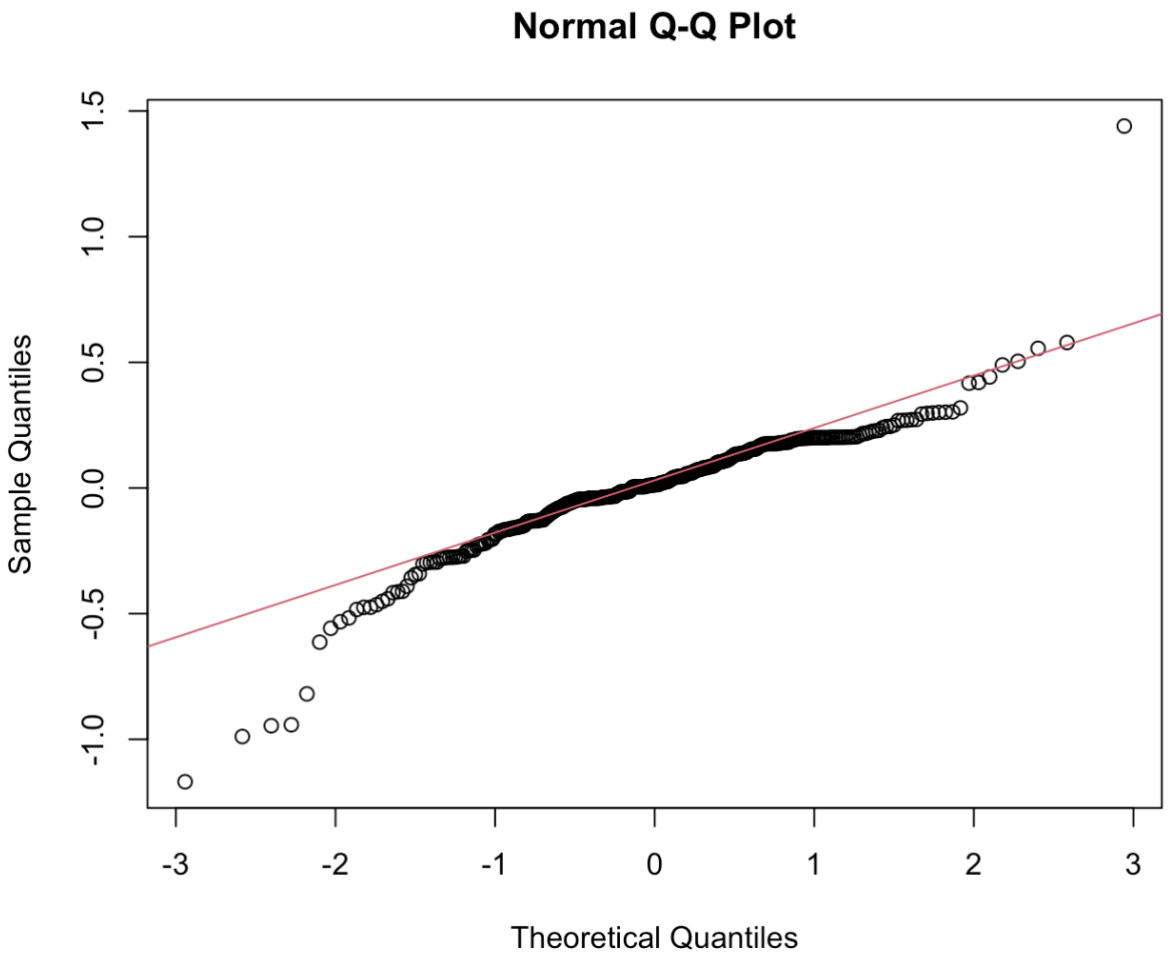
QQ-Plot – STI-Shame



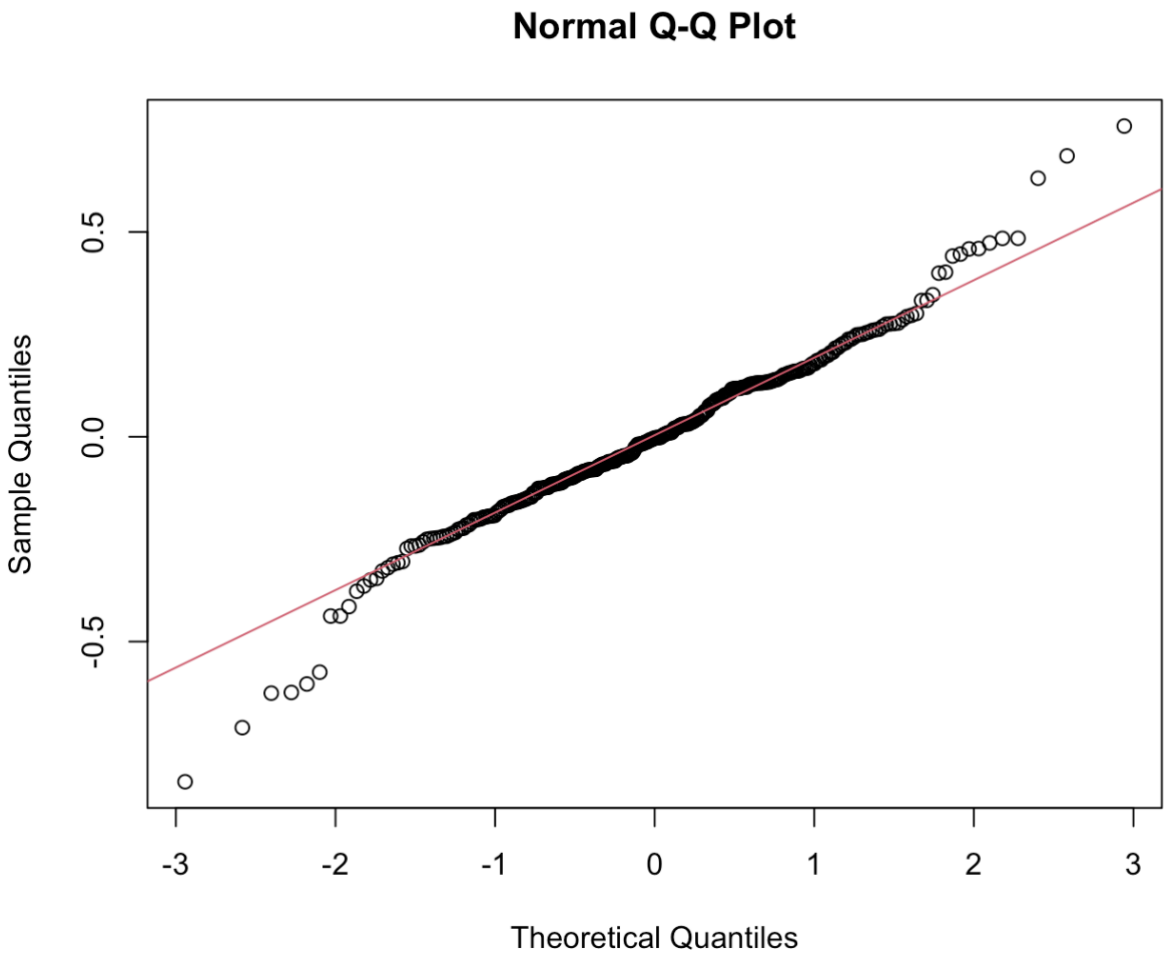
QQ-Plot – STI-Related Stigma



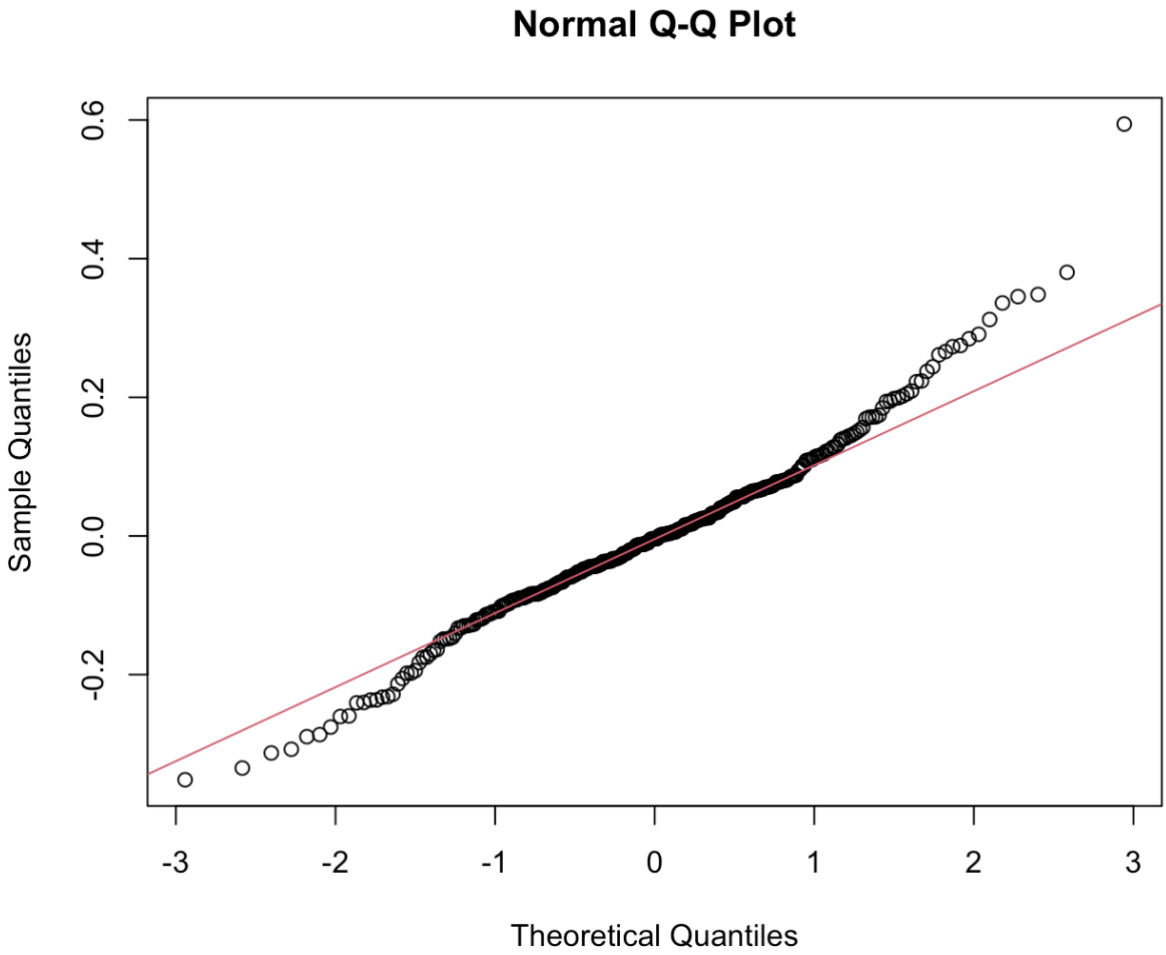
QQ-Plot – Sexual Self-Efficacy



QQ-Plot Comfort with Sexuality



QQ-Plot Sex-Related Guilt


Normal Q-Q Plot
Sample Quantiles
Theoretical Quantiles
-0.2
0.0
0.2
0.4
0.6
-3
-2
-1
0
1
2
3

Qualtrics Questionnaire

· What gender do you identify with?
  - o Female
  - o Male
  - o Non-binary
  - o Prefer not to say

· What is your sexual orientation?
  - o Heterosexual
  - o Gay or Lesbian
  - o Bisexual
  - o Pansexual
  - o Asexual
  - o Prefer not to say

· What is your age?

· What is your Ethnicity?

· What nation were you born in?

· What nation do you currently reside in?

· What is your religion?

Sexual Self-Efficacy Scale (JSI Research 2000)

Reflect on the statements below, how confident are you that you could partake in the following:

Not at all	A little	Somewhat	Very much
1	2	3	4

1. Express that you're not in the mood for intimacy to your partner?
2. Ask your partner to wait while you got a condom or dental dam?
3. Communicate to your partner about how to treat you sexually?
4. Refuse to engage in sexual practices you didn't like?
5. Ask your partner to use a condom or dental dam?
6. Refuse to be intimate because your partner did not want to use a condom or dental dam?

STI-related stigma & shame (Foster & Byers, 2008)

The following questions will examine your attitudes and beliefs regarding sexual health related concerns. Please use the respective scale to answer the following items; 1 (strongly disagree) to 4 (strongly agree).

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4

1. If I were to test positive for an STI I would feel ashamed.
2. If I were to test positive for an STI I would feel worried or anxious.
3. If I were to test positive for an STI I would feel embarrassed.
4. If I were to test positive for an STI I would feel guilty.
5. If I were to test positive for an STI I would feel scared.
6. If I were to test positive for an STI I would feel disappointed.
7. If I were to test positive for an STI I would feel disgusted.
8. You will only get an STI if you are not careful.
9. Once an individual contracts an STI they are considered damaged goods.
10. Only promiscuous people contract STIs.
11. If you were at a clinic for a STI test, everyone would know.
12. If someone has a STI, they will be thought of as a bad person.
13. If someone has a STI, people will gossip.
14. If someone has a STI, health workers will think poorly of them.

Revised 10-item Brief Mosher Sex Guilt Scale (Janda & Bazemore, 2011)

The following questions will enquire about your attitudes regarding sexual practices. We ask you to respond honestly and remember that none of the following information will be linked to your identity.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4

1. Masturbation helps one feel eased and relaxed. (R)
2. Sex relations before marriage are good, in my opinion. (R)
3. Unusual sex practices don't interest me.
4. When I have sexual dreams I try to forget them.
5. ''Dirty'' jokes in mixed company are in bad taste.
6. When I have sexual desires I enjoy them like all healthy human beings. (R)
7. Unusual sex practices are dangerous to one's health and mental condition.
8. Sex relations before marriage help people adjust. (R)
9. Sex relations before marriage should not be recommended.
10. Unusual sex practices are okay if both partners agree. (R)

Tight-Loose Mindset (Gelfand et al., 2011)

Please read the statements below and reflect to see how accurately each statement applies to your own mindset.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4

1. I abide by the social norms that are present in the country that I currently reside in.
2. I reflect on things before acting.
3. I keep my emotions under control.
4. I stick to the rules.
5. I talk even when I know I shouldn't.
6. In social situations, I have the ability to alter my behaviour if I feel that something else is called for.

Multidimensional measure of Comfort With sexuality (Tromovitch, 2000)

The following questions will enquire about your attitudes regarding sexual practices. We ask you to respond honestly and remember that none of the following information will be linked to your identity.

Strongly disagree	Disagree	Agree	Strongly Agree
1	2	3	4

1. I am completely comfortable knowing and interacting with people whose sexual activities significantly differ from my own.
2. I enjoy the opportunity to share my personal views about sexuality.
3. My sexual experiences and explorations are a positive, on-going part of who I am.
4. I am comfortable with my sexual activities, both past and present.
5. I am comfortable talking about my sexual views, my sexual fantasies, and sexual experiences that I have had.
6. My past sexual experiences and explorations have been very worthwhile.
7. It would not bother me if I knew that a good friend enjoys anal stimulation during masturbation.
8. I can freely discuss sexual topics in a small group of peers.
9. I think it is good for people to experiment with a wide range of sexual practices.