

ATTACHMENT STYLES, PARENTAL RELATIONSHIPS AND CHANGES IN  
SEXUAL ORIENTATION

by

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## LIST OF ABBREVIATIONS

<b>Abbreviation</b>	<b>Description</b>
AAS	Adult Attachment Scale
SEM	Structural Equation Model

## **ABSTRACT**

Sexual orientation throughout a lifespan is not always constant. The stability of sexual orientation depends on many factors. This study examines how adult attachment styles and parental relationship satisfaction relate to changes in sexual orientation throughout the four stages of life. Past research on attachment styles has investigated how infant-caregiver relationships, adolescent and adult romantic relationships influence sexual behavior, yet little is known about how these relationships influence the stability of sexual orientation. Participants completed an online survey including an Adult Attachment Scale (AAS) questionnaire and were also asked to report on their sexual orientation, maternal and paternal relationship satisfaction throughout childhood, preadolescence, adolescence and adulthood. Using independent-sample *t*-tests, linear regressions and correlations, we found that high scores on the anxiety dimension of the attachment scale and low parental relationship satisfaction were contributing factors for more changes in sexual orientation. Anxiety mediated the relationship between parental relationship satisfaction and the stability of sexual orientation. Lower levels of relationship satisfaction were associated with higher levels of anxiety, and higher levels of anxiety were associated with more changes in sexual orientation. Future research should look into other social or psychological factors that contribute to changes in sexual orientation.

# 1. INTRODUCTION

## 1.1 Literature Review

The development of sexuality throughout a lifespan is multidimensional. Characteristics of sexuality have been found to be influenced by the amalgamation of biological, cultural, social, psychological, ethical, spiritual and economic factors (Diamond et al., 2015; World Health Organization, 2004). With this idea in mind, social factors consisting of parental involvement need to be further investigated to determine how sexuality is influenced. One theoretical concept that should be considered is Attachment Theory. Past research on attachment has focused primarily on how attachment styles affect infant-caregiver relationships (Ainsworth, et al., 1978; Bowlby, 1973; Main and Solomon, 1990), adolescent and adult romantic relationships (Allen et al., 2007; Bartholomew & Horowitz, 1991; Birnie et al., 2009; Bogaert & Sadava, 2002; Hazan & Shaver, 1987; Paetzold et al., 2015; Shaver & Brennan, 1992), and sexual behavior (Bogaert & Sadava, 2002; Birnbaum et al., 2006; Brassard et al., 2007; Gentzler & Kerns, 2004; Paetzold, et al., 2015; Potard et al., 2017; Tracy et al., 2003), but have scarcely examined how attachment styles relate to stability of sexual orientation throughout individuals' lifespans. This study explores whether and how adult attachment styles and parental relationships relate to the stability of individuals' sexual orientation from childhood to adulthood, thus providing a better understanding of the intricacies of human sexuality.

### *1.1.1 Attachment Theory*

Attachment Theory, pioneered by psychologist John Bowlby (1973), describes the developing psychological and physical bond of an infant's first relationship with its

primary caregiver. This bond creates the basis of the infant's internal working model, which is developed within the infant's first 12-18 months of life. The internal working model is said to shape people's beliefs about themselves and others as well as influence their expectations about social interactions and personal relationships throughout their lives (Bowlby, 1973).

Bowlby's research on attachment theory provides the foundation for how people internally develop relationships with others. His insight on the basis of our internal working model indicates that the quality of our relationship with our caregiver predicts the quality of our relationships with others later on in life. Using attachment theory's internal working model as a reference to how relationships are formed could lead to understanding on how sexual orientation is also developed. Fortunately, developmental psychologists have conducted studies that expand Bowlby's research by identifying different styles of attachment, which categorized different types of behavior between caregivers and infants.

### ***1.1.2 Attachment Styles***

The first group of researchers to expand upon Bowlby's idea on Attachment Theory was developmental psychologist Mary Ainsworth and her colleagues. Through her Strange Situation experiment she identified three major patterns of infant-caregiver relationships categorizing attachment styles as secure, anxious or avoidant (Ainsworth et al., 1978). Ainsworth found that secure attachment styles are developed when caregivers respond consistently to their infants' immediate needs. Anxious attachment styles are developed when caregivers provide inconsistent care for their infants and avoidant attachment styles are developed when caregivers are not often responsive or ignore their

infants' needs. A fourth style of attachment, categorized as disorganized attachment, was later discovered by psychologists Main and Solomon (1990). Disorganized attachment styles are formed when caregivers express negative-intrusive behavior, role confusion or withdrawal towards their infants (Paetzold et al., 2015).

The importance of identifying different attachment styles assists in understanding how people develop their different internal working models. Different internal working models elicit different ways of responding externally to others. The basis of attachment style research helps to narrow down the specifics of how and why people respond the way they do in their relationships.

### ***1.1.3 Attachment Styles and Relationships***

The differences in attachment styles uniquely direct the way relationships are cultivated. Secure attachment styles develop relationships that are considered close, stable and promote a sense of confidence in other people (Allen et. al, 2007; Bartholomew & Horowitz, 1991). Individuals with anxious attachment styles tend to develop more conflicting relationships, show higher levels of dependency and subconsciously express a consistent fear of being abandoned and not loved (Bogaert & Sadava, 2002). Individuals with avoidant attachment tend to feel uncomfortable with intimacy and consistently demonstrate emotional distance toward others (Birnie et al., 2009). Individuals with disorganized attachment styles tend to show anger and aggression towards others and find it difficult to form trust (Paetzold et al., 2015).

Recognizing how individuals with certain attachment styles develop relationships relates directly back to the connection formed with their primary caregiver. According to the theory of an internal working model, how individuals are treated as infants should

relate to how they perceive and treat others. Thus, there should be a connection between how people feel internally about their caregiver and how they perceive and process their romantic relationships.

#### ***1.1.4 Attachment Styles and Romantic Relationships***

Securely attached adults are highly invested in their relationships and maintain high levels of trust and positive emotions towards their partners (Hazan & Shaver, 1987). In anxiously attached adult relationships, individuals show obsessive behavior towards their romantic partners and tend to have higher levels of jealousy and breakup rates (Hazan & Shaver, 1987). Adults with avoidant attachment styles tend to also have higher breakup rates but show low levels of interest in their romantic relationships (Hazan & Shaver, 1987; Shaver & Brennan, 1992). Adults with disorganized attachment styles tend to express suspicion and wariness towards their romantic partners and have very low relationship satisfaction (Paetzold et al., 2015).

These findings show consistent behavioral patterns with previous research on attachment styles and their influence on general relationships. Knowing how attachment styles influence romantic relationships prompts researchers to explore sexual satisfaction within each attachment style group.

#### ***1.1.5 Attachment Styles and Sexual Practices***

Research has also shown that attachment styles extend their influence into the realm of sexual practices in adolescence and adulthood. Securely attached individuals are shown to divulge higher levels of sexual satisfaction and engage in sexual intercourse with fewer partners than those with anxious or avoidant attachment (Birnbaum et al., 2006; Bogaert & Sadava, 2002; Gentzler & Kerns, 2004). Anxiously attached

individuals, particularly among anxiously attached females, have shown to engage in earlier and more frequent sexual intercourse (Tracy et al., 2003), perhaps as a means to fulfill emotional gaps in their childhood from lack of affection from their caregiver (Potard et al., 2017). Adolescents and adults with avoidant attachment tend to either abstain from sexual activity or engage in a high number of superficial short-term sexual relationships as to avoid emotional intimacy (Brassard et al., 2007). Individuals with disorganized attachment have shown high levels of sexual ambivalence by fearing to perform sex due to their lack of trust towards their partner or engage in sexual relations with partners they view as “weak” to assert power over them (Paetzold et al., 2015).

The findings indicated that attachment styles influence multiple aspects of sexuality, such as the relationship satisfaction, number of partners, frequency of sexual activity, the stability of the relationship, and so on. Given that sexual orientation is also an important aspect of sexuality, it is highly possible that attachment style will also influence sexual orientation in a certain way. This study decided to look at sexual orientation as a fluid construct and focused on how it changes with time. It is worthwhile and promising to investigate if attachment styles influences the stability of sexual orientation over the life course.

#### ***1.1.6 Parental Relationship and Adolescents’ Sexual Behavior***

In addition to attachment styles, parental relationships have also been shown to be influential on sexual behavior. For example, adolescents who are anxiously attached to their mothers and daughters with avoidant attachment relationships with their fathers, tend to show a trend of higher involvement in risky sexual activity (Potard et al., 2017). Research has also found a link between parental psychological control and adolescents’

risky sexual behavior. An association with low maternal and paternal psychological control over adolescent daughters has shown to result in less engagement in risky sexual behaviors, whereas high paternal control over adolescent sons has been shown to result in higher engagement in risky sexual behaviors (Oudekerk et al., 2014).

These studies suggest that there is a relation between parental control and adolescents' risky sexual behavior. Thus, how individuals perceive their relationships with their parents should also be considered as it relates to individuals' sexual orientation. In particular, individuals' relationship satisfaction with their parents may be tied to sexual stability and fluidity.

#### ***1.1.7 Sexual Stability and Fluidity***

Expanding upon sexual behavior, studies have explored the stability and fluidity of sexual attraction. Findings have suggested that sexual attraction is indeed changeable among both homosexual and heterosexual persons throughout life (Manley et al., 2015), but individuals' sexual attraction becomes more stable over time (Hu et al., 2016). In other words, a person can show fluctuation in their sexual attraction towards different genders but as they mature their attraction to a certain gender(s) becomes more consistent. Research has also found gender differences in the stability of sexual attraction, revealing that women are more likely to report greater fluidity in attraction than males (Hu et al, 2016; Diamond, 2008; Impett et al., 2014). In other words, women still reported sexual attractions to the opposite gender of their romantic partner, whereas men showed more consistency when reporting the gender of their sexual attraction and romantic partner.

These findings show that changes in sexual attraction do occur. So, it is



theoretically reasonable for this study to investigate the change in sexual orientation (how someone identifies their sexuality: heterosexual, homosexual or bisexual) as well as its prevalence in each attachment style group. The other finding from these studies indicates that sexual fluidity is greater in one sex over the other, which implies that differences between genders should also be considered in this study.

## **1.2 Research Questions and Hypotheses**

Considering the implications that attachment styles have on our building blocks for constructing interpersonal relationships and the degree of our sexual practices, it would be interesting to further investigate if attachment styles have any connection to changes in our self-identified sexual orientation throughout life. And since previous researchers have found that parental relationships can influence our sexual behavior it would also be beneficial to investigate if maternal and paternal relationship satisfaction relates to changes in sexual orientation as well. This study will also include gender as an important factor.

Three hypotheses have been established after reviewing the literature: 1) Attachment styles are associated with the stability of sexual orientation. Specifically, (1a) securely attached individuals will have the least amount of change in their sexual orientation over time due to their high stability in relationships; (1b) anxiously attached individuals will show the most change in sexual orientation over time due to high ambivalent feelings in their relationships; (1c) avoidant and disorganized attachment individuals will have more changes in their sexual orientation over time compared to securely attached individuals due to their fear of intimacy or lack of trust in others; 2) Parent relationship satisfaction is also associated with the stability of sexual orientation.

Individuals with high maternal and paternal relationship satisfaction will show fewer changes in sexual orientation over time due to higher security in their parental relationships; 3) Attachment will play a mediating role between parent relationship and the stability of sexual orientation. Specifically, we expected high relationship satisfaction will predict a more secure attachment, which would in turn relate to fewer changes in sexual orientation.

## 2. METHOD

### 2.1. Research Design

This study used a quasi-experimental within-subject design with the use of an online Qualtrics survey to obtain participants' responses. The survey was divided into six parts. The first part of the survey consisted of an adult attachment style questionnaire. The second through fifth part of the survey consisted of participants rating and reporting their personal maternal relationship satisfaction, paternal relationship satisfaction, sexual orientation, and life event questions at the childhood stage (5-11, "Time 1"), preadolescent stage (12-14, "Time 2"), adolescent stage (15-18, "Time 3"), and adulthood stage (19-current, "Time 4"). The sixth part of the survey asked the participants' demographic information.

### 2.2 Materials and Measures

*Attachment Style.* In this study, identification of attachment styles (independent variable) were assessed using the Adult Attachment Scale (AAS) form Collins & Read (1996). The AAS provides 18 statements that are each categorized into three subscales: Close, Depend, and Anxiety (six statements per subscale). The Close subscale measures the extent to which the participant feels comfortable with closeness and intimacy. An example of a Close statement would be "I am comfortable developing close relationships with others." The Depend subscale measures the extent to which the participant feels that others are available to them when needed. An example of a Depend statement would be "I am comfortable depending on others." The Anxiety subscale measures the extent to which the participant feels rejected or unloved by others. An example of an Anxiety statement would be "I often worry other people will not want to stay with me."

Participants rated on a five-point Likert scale how characteristic each of the 18 statements were to them with a rating of 1 (low score) meaning “not at all characteristic of me” and a rating of 5 (high score) meaning “very characteristic of me.” Securely attached participants are expected to score high on close and depend subscales and low on the anxiety subscale; anxiously attached participants are expected to score high on all three subscales; avoidant participants are expected to show low scores on all three subscales; and participants with disorganized attachment are expected to score low on close and depend subscales and high on the anxiety subscale.

*Parental Relationship.* Participants also produced subjective ratings on a five-point Likert scale that revealed independent parental relationship satisfaction distinctively between mother and father figures (extension of the independent variable). Participants responded to two questions that asked “how would you rate the closeness you felt with your mother/father?” and “how would you rate your relationship satisfaction with your mother/father?” by selecting a number 1 (low score) through 5 (high score) to portray their relationship quality with their parental figures in each stage of life (Harris et al., 2009).

*Sexual Orientation.* Sexual orientation (dependent variable) was defined as the biological gender to which a person is attracted to (Hu et al., 2016) and was identified as either heterosexual (attraction to opposite gender), bisexual (attraction to both genders), homosexual (attraction to same gender). Measurement of the dependent variables were continuous throughout reflection of childhood, preadolescence, adolescence and adulthood by having participants select their sexual orientation on the seven-point Kinsey Scale (0-6) (Kinsey et al., 1948). 0 was rated as exclusively heterosexual, 1 was rated as

predominantly heterosexual with incidental homosexuality, 2 was rated as predominantly heterosexual but more than incidental homosexuality, 3 was rated as equally heterosexual and homosexual, 4 was rated as predominantly homosexual but more than incidental heterosexuality, 5 was rated as predominantly homosexual with incidental heterosexuality, and 6 was rated as exclusively homosexual.

### **2.3 Participants**

Participants were recruited from the Texas State University Psychology Human Subject Pool composed of students in the PSY 1300 course and students in upper level Texas State University Psychology courses. Course credit or extra credit compensation may be provided to participants. There were 782 participants in this study, including 639 females, 136 males, and 7 who did not report gender. The ethnicities of the participants were White (71.2%), Latino/Hispanic (40.7%), African American (16.4%), Asian American/Pacific Islander (5.6%), Native American/Alaskan Native (3.7%) and Other (8.5%). Religious beliefs were reported as well indicating that participants were Christian (35.4%), Atheist (2.4%), Agnostic (4.5%), Catholic (24.0%), did not identify with a religion (6.9%) and Other (26.8%).

### **2.4 Procedure**

Surveys were administered via the Texas State University online Qualtrics system. After the participant provided consent to participate in the survey, they were taken to the main (survey) portion with the following measures. The first measure was the AAS questionnaire, measuring relationship attachment styles (secure, anxious, avoidant or disorganized) and took approximately five minutes to complete. The next part of the survey was conducted in four stages in which the participant is asked to reflect on

their childhood, preadolescence, adolescence and adulthood. The participant was asked to access and report their maternal and paternal relationship satisfaction, their sexual orientation and to identify if specific life events occurred during each stage. This portion of the survey took no more than 20 minutes to complete. Following these measures, demographic information was collected, and this included: biological sex, race/ethnicity, age, religion and education and took approximately five minutes to complete. The total approximate time to complete the measures with the demographic information was 30 minutes. Participants were then provided a debriefing form at the end of the survey and were also thanked for their time and contribution to the study.

## **2.5 Analysis Strategy**

*Strategies to test the relationship between attachment style and stability of sexual orientation:*

(1) Stability of sexual orientation was measured as a dichotomous variable, 0 was represented as “no change” and 1 was represented as “change.” A Chi Square Test of Independence was conducted as an initial check to whether attachment styles related to changes seen in participants’ sexual orientations. Specifically, the percentage of participants who changed sexual orientation over the four time periods (Time 1, Time 2, Time 3, Time 4) were calculated in each attachment style, and then compared with the expected percentage which is assumed to be equal across different attachment styles. A significant Chi-square will support the non-independence of sexual orientation change and attachment style.

(2) Stability of sexual orientation was also measured as a continuous variable. Since sexual orientation was measured as a continuous variable, we are able to calculate

the total number of changes as an indicator of stability of sexual orientation, and then perform some parametric tests. The mobility of sexual orientation was calculated for each participant as the self-reported number of shifting in sexual orientation during the four life stages. Then multiple regressions were performed to predict the number of changes in sexual orientation using attachment while controlling for gender.

*Strategies to test the relationship between parental relationship and stability of sexual orientation:*

Correlation and regressions were used to examine the effect of parental relationship on the change in sexual orientation. Specifically, satisfaction with maternal and paternal relationships at each stages of life were used as predictors to predict the sexual orientation at the next stage, as well as the total number of changes.

*Strategies to test the mediating effect of adult attachment style between parental relationship and stability of sexual orientation:*

Structural Equation Modeling (SEM) was conducted to examine the mediating effect of attachment style. It was hypothesized that a better parental relationship from childhood to adulthood would predict a secure attachment style, which is related to more stable sexual orientation.

### **3. RESULTS**

#### **3.1 Sexual Orientation Across Time**

To describe the composition of the participants in sexual orientation, a frequency table was created to show the percentage of different sexual orientation categories during each stage of life (See Table 1). Majority of participants (>60%) were exclusively heterosexual, and about 1-3% of participants were exclusively homosexual. There were still a considerable proportion of participants who were in between.



Table 1. Frequency table of sexual orientation

Life Stages	Sexual Orientation						
	Heterosexual		Bisexual			Homosexual	
	Exclusively heterosexual (0)	Heterosexual, incidental homosexual tendencies (1)	Heterosexual, more than incidental tendencies (2)	Bisexual, equally heterosexual and homosexual (3)	Homosexual, more than incidental heterosexual tendencies (4)	Homosexual, incidental heterosexual tendencies (5)	Exclusively homosexual (6)
Time 1	73.8% (577)	10.5% (82)	5.5% (43)	4.5% (35)	1.4% (11)	1.2% (9)	1.7% (13)
Time 2	72.9% (570)	11.3% (88)	5.6% (44)	5.2% (41)	1.5% (12)	1.3% (10)	1.3% (10)
Time 3	69.1% (540)	11.3% (88)	5.4% (42)	7.5% (59)	1.2% (9)	1.4% (11)	2.3% (18)
Time 4	65.1% (509)	10.0% (78)	5.1% (40)	7.3% (57)	1.0% (8)	1.0% (8)	2.7% (21)

### **3.2 Attachment Styles and Stability of Sexual Orientation**

A Chi-square test of independence was performed to examine the relation between attachment styles and whether there was change or no change in sexual orientation from one time point to the next. The relation between these variables was significant,  $X^2(3) = 13.756, p = .003$ . Table 2 shows the frequency and percentage of change in sexual orientation within each attachment style. As shown in Table 2, individuals with anxious (33.2%) and disorganized (35.6%) attachment were more likely to change their sexual orientation than individuals with secure (24.7%) and avoidant (19%) attachment.

Table 2. Frequency table for attachment styles and stability of sexual orientation

		<b>Attachment Styles</b>			
		Secure	Anxious	Avoidant	Disorganized
<b>Sexual Orientation</b>	No Change	75.3% (73)	66.8% (221)	81%(124)	64.4% (87)
	Change	24.7% (24)	33.2% (105)	19% (29)	35.6% (48)

### 3.3 Attachment Dimensions and Stability of Sexual Orientation

Since anxious and disorganized attachment styles are both high in the anxiety dimension, and the secure and avoidant attachment styles are both low in the anxiety dimension, it is highly possible that the anxiety dimension instead of the attachment style is the actual factor that influences the stability of sexual orientation. So, next we examined the relationship between attachment dimensions (anxiety score and close/depend score) and stability of sexual orientation.

#### 3.3.1 Stability of Sexual Orientation as a Dichotomous Variable (*Change vs. No Change*)

An independent-samples *t*-test was conducted to compare the mean depend/close scores in no change and change of sexual orientation categories. Results indicated that there was not a significant difference in the scores for no change in sexual orientation ( $M = 3.023, SD = 0.40$ ) or change in sexual orientation ( $M = 3.054, SD = 0.387$ ) categories;  $t(699) = -0.93, p = 0.351$ . These results suggest that the close/depend dimension of the attachment scale was not associated with the stability of sexual orientation.

An independent-samples *t*-test was conducted to compare the mean anxiety scores in no change and change of sexual orientation categories. There was a significant difference in the scores for no change in sexual orientation ( $M = 3.129, SD = 0.98$ ) and change in sexual orientation ( $M = 3.476, SD = 0.95$ ) categories;  $t(699) = -4.30, p < .001, Cohen's D=0.360$ . These results suggested that the anxiety dimension of the attachment scale was significantly associated with the stability of sexual orientation. Specifically, people with higher anxiety scores are more likely to be unstable in their sexual orientations.

### ***3.3.2 Stability of Sexual Orientation as a Continuous Variable (Number of Changes)***

A linear regression was performed to evaluate how well anxiety attachment style scores could predict number of changes in sexual orientation while controlling for gender. The regression coefficients are shown in Table 3. Results indicated that anxiety significantly predicted the number of changes in sexual orientation,  $\beta = 0.149, p < .01$ , however, the effect of close/depend was not significant,  $\beta = 0.149, p > .05$ . The whole regression model was significant,  $F(2, 698) = 6.817, p < .001, R^2 = .019$ . The regression results suggested that participants with more anxiety are more likely to have more changes in their sexual orientation.

Table 3. Multiple regression on the number of changes in sexual orientation

<b>DV</b>	<b>IV</b>	<b>B</b>	<b>SE</b>	<b>Beta</b>	<b><i>p</i> value</b>
Number of Changes	Close/Depend	-0.053	0.080	-.027	.509
	Anxiety	0.103	0.032	.133	.002
	Gender	0.136	0.075	.069	.071

*Note:* the interaction between gender and attachment dimensions were also examined, but not significant,  $p > .05$ , therefore they were removed from the model.

### **3.4 Parental Relationship and the Change of Sexual Orientation**

A correlation analysis was performed to explore the relationship between parental relationship, sexual orientation across four time points as well as their relationship to current anxiety levels and total number of changes in sexual orientation. Correlation results are shown in Table 4.

Table 4. Correlation table (N = 701)

	Mom1	Mom2	Mom3	Mom4	Dad1	Dad2	Dad3	Dad4	SO1	SO2	SO3	SO4	Anx.
Mom1	1												
Mom2	.730**	1											
Mom3	.616**	.628**	1										
Mom4	.634**	.611**	.797**	1									
Dad1	<b>.221**</b>	.166**	.092*	.124**	1								
Dad2	.215**	<b>.308**</b>	.125**	.138**	.786**	1							
Dad3	.170**	.199**	<b>.250**</b>	.188**	.687**	.730**	1						
Dad4	.170**	.197**	.174**	<b>.261**</b>	.675**	.708**	.869**	1					
SO1	-.102**	-.088*	-.119**	-.129**	-.089*	-.076*	-.048	-.062	1				
SO2	-.090*	-.095**	-.109**	-.116**	-.119**	-.111**	-.091*	-.099**	.830**	1			
SO3	-.095**	-.117**	-.130**	-.144**	-.098**	-.123**	-.111**	-.129**	.723**	.831**	1		
SO4	-.091*	-.126**	-.156**	-.134**	-.100**	-.141**	-.116**	-.130**	.704**	.805**	.966**	1	
Anxiety	-.087*	-.061	-.111**	-.119**	-.158**	-.152**	-.149**	-.155**	.119**	.121**	.109**	.129**	1
Change	-.083*	-.167**	-.144**	-.143**	-.096*	-.123**	-.127**	-.106**	.306**	.395**	.473**	.475**	.134**



The correlation results suggested a strong auto-regressive effect of parental relationship and sexual orientation across four time points (the correlation coefficients in the dark gray areas are very high, all above 0.6, and most of them above 0.7). The highest correlation between maternal and paternal relationship happened at the same time point (the bold numbers in the median gray area), indicating a concurrent association. Parental relationships at all time points except the maternal relationship at Time 2 significantly correlated with anxiety and number of changes, and anxiety significantly correlated with the number of changes. Parental relationships at all time points negatively correlated with sexual orientations (the light gray areas in Table 4), indicating that better parental relationships were associated with sexual orientations directed towards heterosexual.

#### ***3.4.1 Parental Relationship and the Number of Changes***

According to the correlation results, a path model was established (Figure 1), where an auto-regressive path was constructed for maternal relationship satisfaction and for paternal relationship satisfaction across four time points. And the covariance between maternal and paternal relationship satisfaction was constructed at each time point. Finally, current parental relationships were used to predict the current anxiety level and the total number of changes in sexual orientation. Gender was controlled in this model. The initial fitting of this model indicated that the direct effect of current paternal relationship on changes in sexual orientation was not significant, therefore this path was removed from the final model. The path coefficients in the final model are shown in Figure 1. The fit of this final model is acceptable,  $CFI = 0.945 > 0.9$ ,  $RMSEA = 0.091 < 0.1$ .

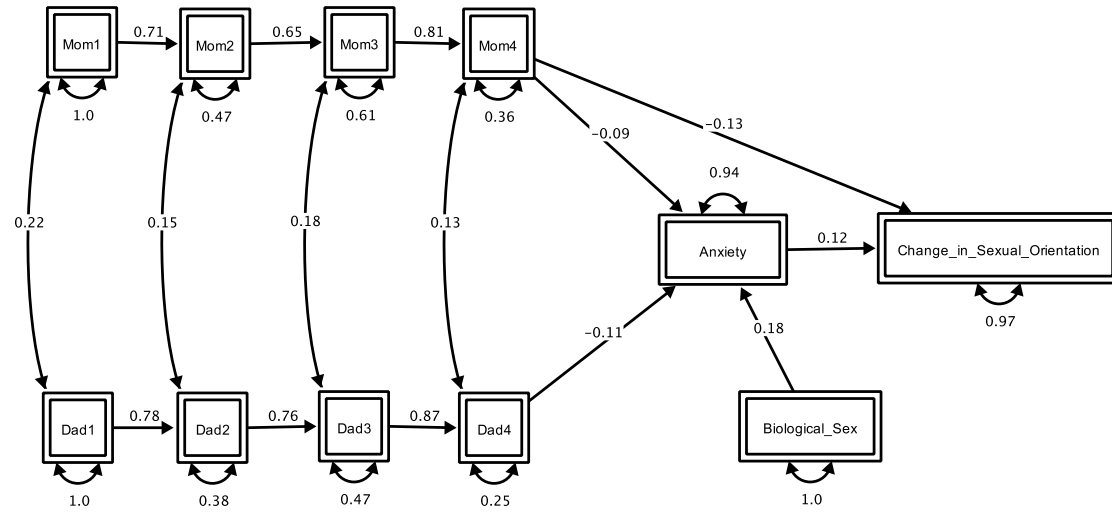


Figure 1. The path model of parental relationship, attachment and stability of sexual orientation

This path model indicated that parental relationships influence the stability of sexual orientation through the mediating role of anxiety. A worse relationship is associated with higher levels of anxiety, and a higher levels of anxiety are associated with more changes in sexual orientation. We also found a direct effect of maternal relationship on the stability of sexual orientation, indicating that besides influencing anxiety, maternal relationship has other mechanisms that can impact the change of sexual orientation.

### ***3.4.2 Parental Relationship and the Direction of Changes***

According to the correlation table (the light gray area in Table 4), changes in sexual orientation were most impacted by parental relationships at a later life stage. We decided to use parental relationships at a certain time point to predict sexual orientation at the next time point to examine how parental relationships influence the direction of change in sexual orientation. Specifically, to predict changes in sexual orientation during preadolescence, parental relationship satisfaction scores during childhood were assessed; to predict changes in sexual orientation during adolescence, parental relationship satisfaction scores during preadolescence were assessed; and to predict changes in sexual orientation during adulthood, parental relationship satisfaction scores during adolescence were assessed.

Linear regression analyses were performed and the effects of biological gender and its interaction with parental relationships were also included in the model. The regression results are shown in Table 5.

Table 5. Regressions to predict sexual orientation at each time

<b>DV</b>	<b>IV</b>	<b>B</b>	<b>SE</b>	<b>Beta</b>	<b><i>p</i> value</b>
Preadolescence Sexual Orientation (Time 2)	Gender	-.006	.116	-.002	.959
	Mom1	-.298**	.101	-.243	.003
	Gender X Mom1	.237*	.112	.174	.035
	Gender	-.034	.115	-.011	.767
	Dad1	-.320*	.108	-.260	.003
	Gender X Dad1	.208	.119	.155	.080
Adolescence Sexual Orientation (Time 3)	Gender	.063	.131	.017	.632
	Mom2	-.342**	.122	-.248	.005
	Gender X Mom2	.224	.133	.148	.093
	Gender	.033	.131	.009	.804
	Dad2	-.426***	.122	-.309	.000
	Gender X Dad2	.299*	.133	.197	.025
Adulthood Sexual Orientation (Time 4)	Gender	.110	.136	.030	.416
	Mom3	-.389**	.119	-.275	.001
	Gender X Mom3	.210	.133	.133	.114
	Gender	.014	.136	.004	.917
	Dad3	-.383**	.124	-.272	.002
	Gender X Dad3	.226 <sup>+</sup>	.137	.170	.053

Note: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ , <sup>+</sup>  $p < .06$

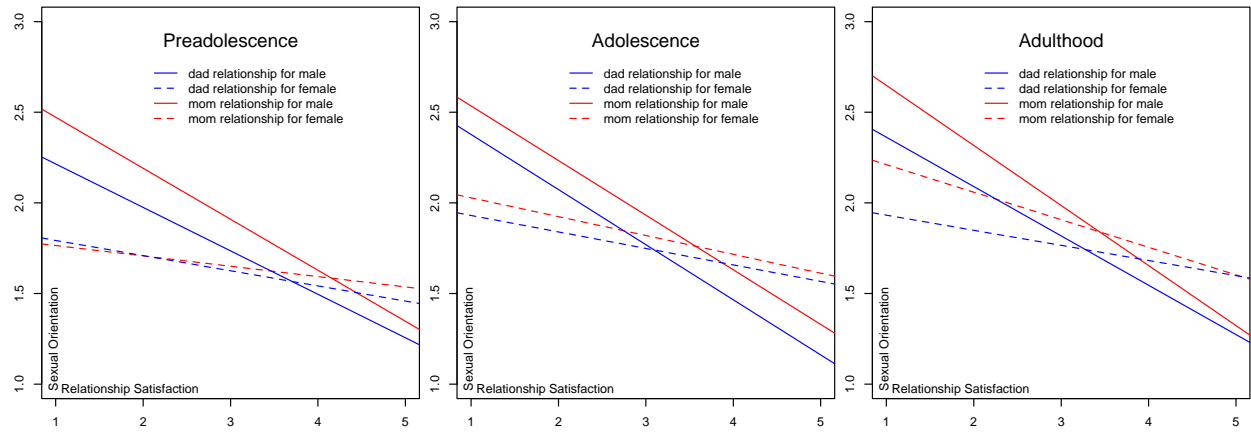


Figure 2. Simple slope analysis using parental relationship satisfaction to predict sexual orientation

The analyses to predict preadolescence sexual orientation found a significant main effect of paternal relationship,  $\beta = -0.260$ ,  $p < .01$ , higher satisfaction with paternal relationship predicted a sexual orientation more towards heterosexual for both male and females (in Figure 2a, both blue lines have a negative slope and the slopes are significant). We also found a significant interaction effect between maternal relationship and gender, indicating that the impact of maternal relationship on males and on females were different. Simple slope analysis suggested that higher maternal relationship satisfaction predicted more heterosexual orientation for males, but not for females (in Figure 2a, the slope of the red real line is significant, but the slope of the red dash line is not).

The analyses to predict adolescence sexual orientation found a significant main effect of maternal relationship,  $\beta = -0.248$ ,  $p < .01$ , higher satisfaction predicted more heterosexual orientation for both males and females (in Figure 2b, both red lines have a negative slope and the slopes are significant). The interaction effect between paternal relationship and gender was significant,  $\beta = 0.197$ ,  $p = .025$ . Simple slope analysis suggested that paternal relationship satisfaction had a larger impact on male participants than female participants (in Figure 2b, both blue lines are negative and significant, but the blue real line is significantly steeper than the blue dash line).

The analyses to predict sexual orientation during adulthood repeated the pattern of the previous time points. Maternal relationship satisfaction had a significant main effect,  $\beta = -0.275$ ,  $p < .001$ , higher satisfaction predicted more heterosexual orientation for both males and females (in Figure 2c, both red lines are significantly negative), while the effect of paternal relationship was differed by gender, with the interaction effect

marginally significant,  $\beta = .170$ ,  $p = .05$ . Simple slope analysis suggested that paternal relationship satisfaction had a larger impact on male participants than on female participants (in Figure 2c, both blue lines are significantly, but the blue real line is significantly steeper than the blue dash line).

In sum, for males, both parental relationship satisfaction influences their sexual orientation from preadolescence to adulthood; for females, maternal relationship starts to have an impact in adolescence, and paternal relationship always had a significant impact. In general, parental relationships had a larger impact on males' sexual orientation than females' sexual orientation (in Figure 2, all real lines are steeper than the dash lines).

## 4. DISCUSSION

### 4.1 Main Findings

The first aim of this study was to investigate how attachment styles might influence changes in sexual orientation. Our hypotheses predicted that securely attached individuals would have the least amount of change in their sexual orientation over time due to their high stability in relationships and anxiously attached individuals would show the most change in sexual orientation over time due to high ambivalent feelings in their relationships. These hypotheses were partially supported.

In our study, we found that individuals with secure and avoidant attachment had fewer changes in their sexual orientation than the individuals with anxious and disorganized attachment styles. Noticeably, avoidant attachment had the least amount of change among the four attachment styles. Based upon previous literature indicating that individuals with avoidant attachment feel uncomfortable with intimacy and prefer to distance themselves from others (Birnie et al., 2009), it makes sense that these individuals would have the least amount of changes in sexual orientation since they tend to steer clear from relationships in general. So, if avoidantly attached individuals are not seeking intimacy or relationships, then there is less opportunity for changes in their sexual preferences.

We also note that individuals with disorganized attachment styles actually had the most overall changes, even more than the anxiously attached individuals. Upon further investigation, we speculated that the reason for these findings could be that the commonality between secure and avoidant attachment is that they are both low on anxiety and the commonality between anxious and disorganized attachment styles is that



they are both high in anxiety when measured on the AAS questionnaire. Through our analyses we confirmed that anxiety levels did in fact influence stability of sexual orientation, whereas close/depend levels did not have a significant influence on stability of sexual orientation.

Our results suggest that individuals with higher anxiety levels are more likely to have more changes in their sexual orientations compared to individuals with less anxiety. With this finding, we illuminate a psychological component that influences the stability of sexual orientation. Relating to past research, individuals with higher anxiety levels, specifically those categorized with anxious and disorganized attachment, have been associated with higher break up rates (Hazan & Shaver, 1987) and less trust towards romantic partners (Paetzold et al., 2015). Another consequence of high anxiety levels is that these individuals tend to express less satisfaction in their sexual relationships with their partners (Potard et al., 2017). Therefore, it seems as though anxiety has precedence in determining relational aspects, including sexual stability. Research should further investigate how to manage anxiety levels or control the negative consequences of high anxiety levels, so that individuals with higher anxiety may also cultivate healthier relationships.

The second aim of this study was to investigate if there was an association between parental relationship satisfaction and stability of sexual orientation. We hypothesized that parental relationships are also associated with the stability of sexual orientation and that individuals with high maternal and paternal relationship satisfaction will show fewer changes in sexual orientation over time due to higher security in their parental relationships. This hypothesis was supported with the exception of maternal

relationship at Time 2 (in the expected direction, but not significant). Both maternal and paternal relationship satisfaction correlated with changes in sexual orientation, and higher relationship satisfaction predicted less changes in sexual orientation.

To examine the third hypothesis on the mediating role of attachment, we investigated the relationship between parental relationship satisfaction and the anxiety dimension of attachment. We found that the anxiety dimension of attachment indeed played a mediating role between parental relationship and stability of sexual orientation. Specifically, participants that indicated better relationships with their parents were associated with lower levels of anxiety, which then related to less changes in their sexual orientations. Participants that indicated worse relationships with their parents were associated with higher levels of anxiety, which then related to more changes in their sexual orientation. This finding supported our third hypothesis and revealed how the role of anxiety, a psychological factor, played a mediating role between parental relationship and sexual behaviors.

Besides the above hypotheses, there are some additional findings that are open for future investigation. For example, we found that higher parental relationship satisfaction is consistently related to a sexual orientation directed towards the heterosexual direction of the sexual fluidity scale we used. We also found that parental relationship showed remarkable consistency across time based on the evidence of a high auto-regressive effect between times. Moreover, we found that the impact of parental relationship on sexual orientation is larger in male participants than female participants.

## **4.2 Implications**

### ***4.2.1. Theoretical Implications***

In our study, sexual orientation was constructed not as a categorical variable but as a continuous variable. The reason we chose to measure sexual orientation as a continuous variable was to easily measure sexual fluidity throughout the four life stages and to reiterate that human sexuality is not always consistent, in accordance with previous findings in literature (Manley, Diamond, & van Anders, 2015; Hu et al, 2016; Impett, Muise, & Peragine, 2014). By utilizing sexual orientation as a continuous variable, we were able to expand the classification of sexual attraction and specifically track changes in sexual orientation from one time point to the next.

Attachment styles influence personal and romantic relationships (Paetzold et al., 2015, Birnie et al., 2009; Allen et. al, 2007; Bogaert & Sadava, 2002; Shaver & Brennan, 1992; Bartholomew & Horowitz, 1991; Hazan & Shaver, 1987), this study added to the literature by saying that attachment styles also influence the stability of sexual orientation, but specifically, we recognized that the anxiety dimension of the AAS questionnaire played the strongest role when analyzing changes in sexual orientation.

We also highlighted the role of paternal relationships. In this study, we found that paternal relationships had an impact on both female and male participants, beginning as early as childhood. Paternal relationships consistently impacted participants' anxiety levels and stability of sexual orientation in each stage of life. Past research has shown that paternal relationships have a stronger influence on sons' psychological development compared to daughters' (Gryczkowski et al., 2010; Harris & Morgan, 1991). However, our findings indicate that paternal relationships have a strong influence on both sons' and

daughters' psychological development. One would think that maternal relationships would have more influence on children due to the fact that mothers tend to show more involvement and have more interactions with them (Gryczkowski et al., 2010; Pleck & Masciadrolli, 2004). It seems our finding may provide evidence that paternal relationships are at least as important as maternal relationships on individual's stability of sexual orientation.

We also highlighted the difference between male and female participants. Male participants' sexual orientation was more largely influenced by parental relationships than females' sexual orientation. It is possible that this finding indicates there are other or different external or internal factors that have a stronger influence on females' sexual orientation than males. Our findings add to literature by showing that gender also impacts the effect size of parental relationships on the fluidity of sexual orientation.

#### ***4.2.2 Practical Implications***

Our study provided an angle to address this issue, which highlighted the psychological factor of anxiety at the individual level and the family factor of parental relationship at the social level, as well as the interplay of the two levels of factors together. We found that better parental relationships at the social level are important to help reduce anxiety at the individual level and a lower level of relationship anxiety was associated with a more stable sexual orientation.

Since research has shown that anxious and disorganized attachment styles are associated with caregivers not fully meeting infants' psychological needs (Main and Solomon, 1990; Ainsworth, Blehar, Waters & Wall, 1978), it is possible that we see more changes in these individuals' sexual orientations because they are trying to fulfill their

psychological needs later on through their romantic partners. Therefore, the lack of psychological needs being met at infancy create higher levels of anxiety in these individuals, which then perpetuates how these individuals anticipate interactions with their romantic partners. This information may provide evidence as well as a new source of knowledge for future public educations on the intricacies of human sexuality, on the effects of family environment, role of paternal relationships, gender differences, anxiety and psychological well-being.

### **4.3 Limitations and Future Directions**

Participants for this study were recruited primarily from undergraduate psychology courses from a university in central Texas. Thus, one major limitation is the sample of participants because the results found with undergraduate college students does not necessarily represent the general population. Future research on this particular topic should consider encompassing a broader participant sample to incorporate a more diverse demographic of people to improve external validity. Another limitation with the sample is that the majority of our participants were females; therefore, the power for our statistical analyses for male participants were not as high compared to our analyses for female participants. This limitation can pose an issue because our results on gender differences could possibly differ if we had a more balanced male to female ratio in our study. Future research should include more male participants as to verify gender differences in relation to changes in sexual orientation. A third limitation with our sample was that majority of our participants classified as heterosexual. Although only 4.5% of the general population in the United States consists of sexual minorities (Newport, 2019), future research should consider obtaining more sexual minority participants through

national data.

A second limitation in our study was that we used a one-time survey to gather retrospective longitudinal data. Although we asked participants to reflect on specific stages of their life when thinking about parental relationship satisfaction and their sexual attraction, their perception of these memories during specific time periods could be altered, especially when reflecting on memories from early childhood and preadolescence, due to the extensive amount of time passed. To provide more construct validity, future research should consider collecting this type of data using real-time longitudinal measures.

A third possible limitation in our study could be our adult attachment measure. The AAS questionnaire we used in our study was developed in 1996, which might indicate that this scale is outdated. To our current knowledge, there is not a more current or reconstructed version to measure adult attachment styles. Therefore, it is possible that the close/depend subscale in the AAS are lacking validity. Or perhaps, the anxiety subscale in the AAS used in this experiment is the focal point to investigate stability of sexual orientation. Future research should consider using other attachment scales to cross-validate our findings using the AAS scale, or revising the close, depend and anxiety measures in the AAS to more accurately categorize adult attachment and to strengthen construct validity.

Another limitation was that we only looked at one specific social factor that influences changes in sexual orientation. Since research has found that human sexuality is multidimensional and is also affected by biological, cultural, psychological, ethical, spiritual and economic factors (Diamond et al., 2015; World Health Organization, 2004),

future research should consider incorporating these variables as well. Perhaps, future research can extend on our findings and observe biological and/or cultural factors that specifically influence higher levels of anxiety in individuals since anxiety was our determining factor for change in sexual orientation.

## **5. CONCLUSION**

The findings in our study partially support our hypotheses on how attachment styles influence stability of sexual orientation throughout a lifespan. More so, we found that attachment styles with higher anxiety levels, anxious attachment and disorganized attachment, were related to more changes in sexual orientation throughout the four life stages. Parental relationships during one life stage consistently influenced the parental relationships during the next life stage, which then related to participants' current levels of anxiety. Satisfactory parental relationships were associated with lower psychological anxiety which then was associated with stable sexual orientations.



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