

Testing the stability of adult attachment in romantic relationships from an evolutionary perspective

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Abstract

According to attachment theory, individuals who were secure as a child will grow up to be secure in their romantic relationships. This is because, once internal working models of attachment are formed, they remain relatively stable across the lifetime. The aim of this thesis was to test the stability of adult attachment in romantic relationships from an evolutionary perspective. Five studies were conducted in this endeavour, each addressing the stability of attachment style in romantic relationships in response to either varying socio-ecological conditions or physiological state. The rationale of the thesis is that these or similar variations might have been recurrently experienced over the course of human evolution and thus are likely to be potential triggers for adaptive responses. The first three studies tested the stability of attachment and conditional changes in the short term, while the remainder investigated more long-term changes. In the first three studies, participants' attachment security was measured twice, before and after a manipulative condition. In study 1, participants' self-perceived mate value was manipulated by showing them a series of either same-sex attractive, unattractive or a mixture of attractive and unattractive images. In study 2, participants' perceived operational sex ratio was manipulated by showing them either female-biased, male-biased or equal ratio of female and male faces. In study 3, participants were exposed to subtle relationship breakdown cues. The results of these studies showed that individuals' partner attachment security could be changed in the short-term, depending on current experience and the perceived social environment. In study 4, to test the stability and change depending on long-term physiological changes, I investigated whether congruent oral contraceptive use influences partner attachment security. Congruency in oral contraceptive use was found to influence the partner attachment security in coupled women, such that previous and current OC users reported higher partner attachment anxiety. The studies also revealed that the origin of influences on general attachment security in relationships is not entirely parental: attachment to partners is a better predictor of attachment in romantic relationships. Study 5 provided cross-cultural support for this by comparing results from individualist and collectivist countries. In conclusion, adult attachment is flexible and could be changed depending on the current experiences. Attachment is multifactorial and complex, and is not only associated with childhood experiences.

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Chapter 1: General Introduction

1.1 Introduction

Attachment is identified as a close emotional bond between the infant and the caregivers (Bowlby, 1969). These bonds are believed to be necessary for the survival of infants. Children's psychosocial development takes place as they form relationships, communicate with others, and learn to recognize and control their emotions. Therefore, forming healthy attachments is considered to be a major social milestone of infancy in terms of social and emotional development.

According to attachment theory, early experiences with the caregivers play a critical role in children's lives in terms of forming expectations and beliefs regarding the responsiveness and trustworthiness of others. These expectations and beliefs or internal working models that children hold about themselves and others are believed to influence their relationships in adulthood. Therefore, attachment in adulthood is considered to be the partial reflection of their early caregiving experiences (Ainsworth, Blehar, Waters, & Wall, 1978). It is suggested that once the internal working models are formed, they remain relatively stable throughout the life span. In this thesis, I aimed to test the stability of adult attachment security in romantic relationships from an evolutionary perspective.

The theory of attachment is a comprehensive theoretical framework that employs multiple disciplines, such as; ethology, systems theory, evolutionary biology, psychoanalytic theory, and psychology. The theory first started with Harry Harlow in the 1950s and then conceptualised by British psychoanalyst and psychiatrist John Bowlby. Later became testable by another psychologist Mary Ainsworth.

1.2 Harlow's rhesus monkey experiments

Harlow wanted to understand the fundamental variables and mechanisms underlying the development of affectional bonds between the infant and the mother. According to behavioural psychologists, infants would form attachment bonds with a carer that provides nourishment. However, on the other hand, Harlow believed that these bonds are formed as a result of the mother's tactile comfort. He suggested that infants are born with a biological need to cling to and touch something for emotional comfort. To test his hypothesis, he conducted a series of experiments that involved rhesus monkeys (Harlow, 1958).

To understand the formation of affectional bonds between the neonate and the mother, in their experiment Harlow and Zimmerman (1958) separated infant rhesus monkeys from their mothers right after birth and placed them into cages with access to two

surrogate mothers. One of the surrogate mothers was made of wire, which provided milk from an attached bottle, while the other surrogate mother was made of soft terry-towelling cloth which provided no food. They found that monkeys would spend more time with the terrycloth mother even though it provided no food and would only go to the wire mother when they were hungry. Once they were fed, they would return to the cloth mother. When a frightening object was placed in the cage, infant monkeys would use the cloth mother as a “safe base” and seek comfort. The cloth mother was more effective in reducing the infants’ fears. When the cloth mother was present, infant monkeys would explore their surroundings more. The findings of this experiment showed the importance of contact comfort in the development of affectional bonds and suggested that there is more to the mother-infant bond than nourishment.

1.3 Bowlby’s attachment theory

Based on the work of Harlow and others, John Bowlby developed the concept of attachment theory. According to attachment theory, human beings are born with a tendency to form strong affectional bonds with particular others- usually primary caregivers (Bowlby, 1979). The attachment system was evolved to maintain proximity between infants and their caretakers under a state of danger or threat. In order to seek proximity to attachment figures and ensure survival, infants use a behavioural system referred to as *attachment behaviours* (Bowlby, 1969). These behaviours include crying, vocalising and searching to seek proximity, and smiling, clinging to maintain the proximity. Bowlby proposed that infants are biologically inclined to seek and obtain proximity to caregivers. Through relationships with caregivers, infants establish a sense of whether they are worthy of love and support, as well as a sense of whether the caregivers can be trusted and relied on to provide support and care. According to the attachment behavioural system, the child wants to be with the attachment figure particularly in stressful circumstances (proximity-seeking), acquires comfort and security from the attachment figure (secure base), and protests when the attachment figure is not available (separation) (Jones, 2015).

Robertson and Bowlby (1952) investigated the impact of early parent-infant separations. Through their observations, they found that children who had been separated from their caregivers underwent a series of emotional and behavioural reactions. When infants get separated from their caregivers first, they will *protest* to attract their caregivers’ attention. The stage of protest is identified by crying and visible signs of distress. Responsive and sensitive caregivers will respond to these vocalisations by returning and

comforting infants. However, insensitive and unresponsive caregivers will cause infants to develop representations that care will not be given or inconsistently received. If the protest is not successful, then the second stage- *despair* occurs. In the despair stage, the search and protests stop. This reaction is believed to be developed to protect infants from predators, where vocalisation to seek proximity becomes unsuccessful. Lastly, infants who went through the protest and despair stages without reuniting with the caregivers enter a stage called *detachment*. Infants who experience prolonged separations become detached from their caregivers. This will allow the infants to develop new attachment relationships with new caregivers.

1.4 Individual differences in attachment patterns

Although the aim of attachment (i.e. seeking a secure base) is similar for all children, the mechanism they use to seek proximity differs depending on their caregiving experiences and the responsiveness and sensitivity of the caregivers. To provide support to Bowlby's theory, Ainsworth and her colleagues carried out a series of laboratory observations.

The study called *Strange Situation* was designed to study infant-parent attachment (Ainsworth et al., 1978). In this study, 12-month-old infants and their mothers were brought to the laboratory and systematically separated from and reunited with each other. It also included interactions with a stranger, both in the presence and absence of the mother. It was repeated several times to explore whether or in what ways the infant uses the mother as a safe base and is willing to explore his/her surroundings in the presence of a stranger. The study also observed the behaviours displayed by infants when the mother leaves the room and when reunited with the infant.

Through their observations, Ainsworth et al. (1978) identified three distinct attachment patterns: *secure*, *avoidant* and *anxious-resistant*, based on infants' responses to separation and reunion with the caregiver. Securely attached infants were able to welcome their caregiver upon her return and were able to seek proximity and were easily comforted. These infants consider their caregivers as a secure base on which to discover their surroundings. Infants who are categorised as secure develop a sense of trust in their caregivers' availability and responsiveness. They usually have caregivers who are responsive to their needs. Avoidantly attached infants were distressed when the carer left and seemed to avoid proximity to the caregiver upon reunion. They turned their attention to play with the objects around rather than interacting with the caregiver. Infants who are identified as avoidant develop a belief that they cannot turn to their caregivers for comfort.

They usually have caregivers who are rejecting in the care they provide. Lastly, anxiously attached infants showed ambivalent behaviours towards their caregiver, such as wanting to be comforted by the caregiver but also wanting to punish her. They had difficulty being soothed and comforted. Anxious-resistant infants learn that the care will be unpredictable. Anxiously attached infants usually have caregivers that are insensitive and inconsistent in the care they provide.

Later, Main and her colleagues (1985) introduced a fourth pattern; *disorganised*. They included high-risk samples in their parent-infant attachment examination. Infants classified as disorganised generally have abusive (physically, emotionally, and/or sexually) caregivers. As a result of great stress through their home life, these infants did not pose a coherent attachment strategy. Upon reunion, they froze rather than seeking proximity.

1.5 Internal working models

Based on early interactions with the caregivers, children develop “*internal working models*”. These working models include expectations and beliefs about the caregiver, whether the caregiver is responsive and caring, and expectations about the self, whether the person is worthy of love and care (Bowlby, 1973).

According to attachment theory, beliefs and feelings about self and others are determined by the responsiveness of the caregiver to the child’s needs for security and comfort (Cassidy, 1988). For example, when the caregivers are responsive, warm and available, the child thinks that he/she is worthy of love and develops a belief that others can be counted on when needed. As a result, the child will be more likely to explore his/her surroundings, have sociable interactions with others, and feel secure that the caregiver will be available if needed. The child will develop *secure working models*. In contrast, having rejecting, cold, unpredictable, or insensitive caregivers will cause the child to learn that he/she is not worthy of love and others cannot be relied on for comfort and support. Therefore, the child will develop *insecure working models* (Gillath, Karantzas, & Fraley, 2016a).

Altogether, these experiences are believed to form two key elements of working models: *the model of self* (the representations that individuals develop about themselves) and *the model of others* (the representations individuals develop about others). While the model of self reflects the degree to which an individual sees himself/herself as worthy of love and support, the model of others reflects the degree to which attachment figures and others are perceived as trustworthy, reliable and responsive to meet one’s needs (Gillath,

Karantzas, & Fraley, 2016b). These attachment needs can relate to wanting support and comfort in stressful times and requiring encouragement in personal growth and achievement situations (Collins & Feeney, 2000; Feeney, 2004; Feeney & Thrush, 2010). By adulthood, these views of the self and others will be well established and become sophisticated internal working models that determine what to expect from others and guide behaviours over the lifespan.

1.6 Adult attachment

Prior research in attachment focused on infant-caregiver bonds, but Bowlby (1969) claimed that the attachment system is influential from “cradle to grave”. In the 1980s, researchers started to study adult attachment. Hazan & Shaver (1987) were among the first researchers to investigate attachment bonds in adulthood. They extended Bowlby’s attachment theory on infancy to adult romantic relationships.

Hazan & Shaver (1987) noticed many similarities between infant-caregiver relationships and adult romantic relationships. For instance, similar to infants, adults desire proximity to their partners (proximity seeking), want their partners to provide safety during stressful times (safe haven) and use their partners as a secure base to explore the social world. In their “love quiz” study, they conceptualised the range of romantic love experiences in a way that parallels Ainsworth’s attachment patterns. They designed a single-item measure of the three attachment patterns by translating Ainsworth et al.’ (1978) definitions of infants into terms suitable to adult love. While slightly more than half (56%) categorized themselves as secure, the other half split relatively evenly between the categories avoidant (25%) and anxious/ambivalent (19%).

Secure individuals reported to be comfortable with intimacy and found depending on others easy and formed close relationships. On the other hand, anxious/ambivalent individuals were often worried about being abandoned and overwhelmed by social stressors. Avoidant individuals were uncomfortable with intimacy, and it was difficult for them to depend on others and form close relationships.

Even though adult attachment was originally conceptualized as falling under one of the three infant attachment categories (secure, anxious-ambivalent, avoidant), Bartholomew & Horowitz (1991) assumed that there are four rather than three categories, emerging from two underlying dimensions: *anxiety*; the degree to which individuals worry about rejection and abandonment and *avoidance*; the degree to which individuals avoid intimacy and depending on others (Fraley, Waller, & Brennan, 2000).

According to Bartholomew & Horowitz (1991), if an individual's model of self is divided as positive or negative (the self is worthy of love or not) and if an individual's model of others is also divided as positive or negative (other people are trustworthy and reliable or unreliable) then four attachment styles should be constructed. Therefore, they created a model of four attachment styles derived from anxiety and avoidance dimensions: *secure*, *preoccupied*, *dismissing*, and *fearful*. While the secure and preoccupied styles are parallel to Hazan and Shaver's (1987) secure and anxious/ambivalent styles, the dismissing and fearful styles fall under the avoidant attachment style.

In Bartholomew and Horowitz' (1991) attachment model, a secure attachment style was characterized by low anxiety and avoidance (positive model of self and others). On the other hand, the preoccupied attachment style was characterized by low avoidance and high anxiety (negative model of self and positive model of others). A dismissing-avoidant attachment style was characterized by low anxiety and high avoidance (positive model of self and negative model of others) and lastly, fearful-avoidant attachment style was characterized by both high anxiety and avoidance (negative model of self and negative model of others) (Holmes & Johnson, 2009).

Bartholomew and Horowitz' (1991) study was one of the first studies to assess individual differences in adult attachment from a dimensional perspective. According to the dimensional perspective, the orientation of an individual's attachment is reflected in their position on two distinct dimensions: attachment-related anxiety and attachment-related avoidance. Later, further research by Brennan and colleagues (1998) analysed several statements from interviews and how these statements hang together. They confirmed the two fundamental dimensions; attachment-related anxiety and attachment-related avoidance, as previously mentioned in Bartholomew's model of attachment. While the anxiety dimension is believed to reflect people's mental model of the self, avoidance reflects the model of others (Brennan et al., 1998). Scoring high on attachment-related anxiety dimension indicates worrying about partner's availability, responsiveness and attentiveness. On the other hand, high scores on attachment-related avoidance dimension indicate not preferring to rely on and open up to others. Individuals scoring low on both dimensions are comfortable with depending upon or having other people depend upon them, and feel more okay to get intimate with others.

Although it is more convenient to categorise people into attachment styles, most researchers nowadays conceptualise and measure individual differences in adult attachment dimensionally rather than categorically. The reason is that attachment styles are

considered to be things that vary in degree rather than kind. One of the most popular measures of adult attachment style is Brennan, Clark and Shaver's (1998) ECR scale (Experiences in Close Relationships) that measures attachment in two dimensions; attachment-related anxiety and avoidance. The scale has been revised two times: first as the ECR-R scale (Experiences in Close Relationships-Revised) which includes 36 items (Fraley et al., 2000) and later as the ECR-RS scale (Experiences in Close Relationships-Relationship Structures) (Fraley, Heffernan, Vicary, & Brumbaugh, 2011). The ECR-RS scale includes 9 items for each attachment figure (mother, father, partner, best friend), and if desired, these 9 items can also target only one type of relationship. The ECR-RS scale will be discussed further in Chapter 2.

1.7 Stability and change in attachment

Bowlby (1969) claimed attachment to be from cradle to grave and said that once the internal working models of attachment are formed, they remain relatively stable across the life span. Therefore, an individual's attachment pattern in adulthood is believed to reflect his or her attachment history, beginning with the individual's earliest attachment relationships with caregivers. The exact way in which early representations can shape adult attachment styles is unclear. Hence, different perspectives on this matter have emerged in the literature.

There are two perspectives: *prototype* and *revisionist*. According to the prototype perspective, representations of early attachment experiences with caregivers are preserved over time and keep playing an effective role in attachment behaviour throughout the life span (Owens et al., 1995; Sroufe, Egeland, & Kreutzer, 1990). On the contrary, the revisionist perspective states that early representations are subject to alteration based on new experiences and thus may or may not reflect the same patterns of attachment later in life (Kagan, 1996; Lewis, 1997, 1999). Both perspectives indicate that there is room for both stability and change in attachment patterns. For instance, individuals may become more or less secure when they encounter situations that are inconsistent with their own expectations, leading to instability in attachment patterns (Fraley, 2002).

As infant attachment is shaped by interactions with the caregivers, a change in the interaction patterns can cause a change in attachment. Researchers found high stability of attachment in some infants (Benoit & Parker, 1994; Bowlby, 1988; Schneider-Rosen, Braunwald, Carlson, & Cicchetti, 1985; Waters, 1978) and low stability in maltreated infants (Schneider-Rosen et al., 1985). A previous study found coherence between

participants' attachment in infancy and young adulthood, however, low stability of attachment was observed in high-risk samples (Waters, 1998 as cited in Ruvolo, 2001). A similar longitudinal study found a high correlation between childhood and early adulthood attachment classifications. However, they noted that, along with childhood attachment classification, experiencing stressful life events such as; the death of a close relative, parental divorce, and illness or injury of the individual before 18 years old were strong predictors of adult attachment (Sundin, Wiberg, & Eklöf, 2002). These findings strengthen the argument that, even though attachment patterns are relatively stable, they can still respond to changes in experiences.

Similarly, many studies examined whether attachment characteristics change in adulthood. Researchers using Hazan & Shaver's (1987) three-category measure in their longitudinal studies, ranging from 10 weeks to 2 years apart, found 67% to 80% of individuals to report the same attachment categories at both times (Baldwin & Fehr, 1995; Feeney & Noller, 1992; Fuller & Fincham, 1995; Keelan, Dion, & Dion, 1994; Kirkpatrick & Hazan, 1994; Shaver & Brennan, 1992). Scharfe and Bartholomew (1994) used Bartholomew and Horowitz's (1991) four-category model and detected 56% to 63% of individuals to report the same category 8 months apart. Furthermore, studies that used continuous measures instead of categorical, reported moderate to high test-retest correlations varying from .43 to .73 over periods ranging from 2 weeks to 8 months (Collins & Read, 1990; Fuller & Fincham, 1995; Keelan et al., 1994; Scharfe & Bartholomew, 1994; Shaver & Brennan, 1992; Simpson, 1990). These findings suggest that even though there is a good amount of continuity over time, one's attachment characteristics can show some change over time.

Former research on the stability of attachment focused on examining whether individuals' attachment characteristics change, however, what predicts that change needs further investigation. Many researchers claimed that even though attachment patterns are relatively stable, they can change as a result of various experiences (Gillath, Karantzas, & Fraley, 2016c). These experiences may include loss of loved ones, separations, or finding a partner. For instance, negative life events like relationship dissolution (Ruvolo, Fabin, & Ruvolo, 2001) and other forms of interpersonal loss (Davila & Sargent, 2003; Zhang, 2009) seem to cause a decrease in attachment security. According to Fraley, Gillath and Deboeck (2020), people experience immediate surges in romantic anxiety and avoidance following a breakup. On the other hand, positive relationship experiences, such as intimacy enhancing exercises have been found to increase attachment security in some individuals

(Stanton, Campbell, & Pink, 2017). Similarly, in this thesis, I will test whether current experiences, perceived environment, and past relationship experiences influence partner attachment security.

1.8 Thesis aims and outline

In line with the previous research, in this thesis, I will test the stability of adult attachment in romantic relationships from an evolutionary perspective. I will approach the research questions from an evolutionary perspective by using self-perceived mate value, operational sex ratio, and hormonal contraception to test the stability of attachment. To the best of my knowledge, this is the first attempt to adopt an evolutionary perspective to assess adult attachment stability.

In this thesis, I will test the stability of adult attachment in romantic relationships in different circumstances. This includes both conditional changes dependent on current circumstances in the very short-term (e.g. Chapters 2, 3 and 4) and medium-term (Chapter 5), as well as long-lasting cultural differences (Chapter 6).

I will also explore to what extent parental attachment and romantic attachment are similar, and which predicts current attachment security in close relationships (mother, father, first relationship, current/last relationship?). I will also discuss whether the experience of the very first romantic relationship may override any security derived from the parental relationship (Chapter 6).

The first section of this thesis (Chapter 2, 3 and 4) tests the stability of attachment in the short term and whether it changes depending on the current experience and perceived environment. In these studies, participants' attachment-related anxiety and avoidance will be measured both before and after a manipulative condition. Chapter 2 investigates whether partner attachment security changes after the manipulation of self-perceived mate value. Participants' self-perceived mate value will be manipulated by showing them a series of either same-sex attractive, unattractive or a mixture of attractive and unattractive images. Previous research by Little & Mannion (2006) found exposure to attractive and unattractive same-sex images to induce a change in self-perceived attractiveness and market value dependent mate choice. Therefore, I hypothesise that seeing attractive or unattractive same-sex images will cause a change in partner attachment security.

Chapter 3 tests whether variation in operational sex ratio influences partner attachment security. In this chapter, individuals' operational sex ratio will be manipulated by showing them either female-biased, male-biased or equal ratio of female and male faces. It will also test whether relationship status would have an influence on the outcome. An imbalanced operational sex ratio can influence gender roles and the shape of the relationships (Secord, 1983). Therefore, I predict a change in participants' partner attachment security after manipulation of perceived operational sex ratio.

Chapter 4 investigates whether exposure to cues of relationship breakdown influences partner attachment security. In this chapter, individuals will be randomly assigned to read either a scenario about a happy relationship, a scenario where the character is initiating breakup with a partner, or a scenario about getting rejected by a partner. A previous study found people who had experienced relationship dissolution shift from secure to insecure attachment pattern (Kirkpatrick & Hazan, 1994). Therefore, I predict that exposure to relationship breakdown cues and experiencing a recent relationship dissolution will influence partner attachment security.

The second section of the thesis (chapter 5 & 6) focuses on stability and change of attachment in the medium and long term. It also investigates cultural differences in attachment. Chapter 5 tests whether congruency in oral contraceptive use affects the partner attachment security alongside sexual satisfaction. Partner attachment security will be assessed through the ECR-RS scale. Relationship satisfaction will be assessed by 1-9 scale that includes questions regarding sexual satisfaction such as; the partner's sexual adventurousness, ability to arouse sexually, and nonsexual satisfaction such as; partner's financial resources and intelligence (Garver-Apgar, Gangestad, Thornhill, Miller, & Olp, 2006; Roberts et al., 2012). Previous research found congruency in current and previous contraceptive use, but not current use alone, to predict women's sexual satisfaction with their partners. They found women whose OC use was congruent to report higher sexual satisfaction with their partner compared to women whose use was noncongruent (Roberts et al., 2014). As congruent OC use influences partner sexual satisfaction, it can also influence partner attachment security. Therefore, I predict that noncongruent OC users would be more insecurely attached, as they are sexually less satisfied compared to congruent OC users.

Finally, chapter 6 is a cross-cultural study that investigates the origin of influences on current attachment, comparing data from individualist and collectivist countries (UK, Czech Republic, Turkey and Turkish Republic of Northern Cyprus). It will also investigate

to what extent parental attachment and romantic attachment are similar, whether our first relationship or last current partner influences our general attachment in romantic relationships and if there are any differences across different cultures. The same ECR-RS scale will be used along with relationship and parental questions.

The thesis concludes with a general discussion (Chapter 7) of the implications of the findings presented, as well as presenting suggestions for future research, and methodological improvements.

Section 1

Chapter 2: Does manipulation of self-perceived mate value influence partner attachment security?

2.1 Introduction

According to attachment theory, infants are born with a biological drive to form close emotional relationships with their primary caregivers (Bowlby, 1969). Although the tendency to build these bonds is universal, there are individual differences in the quality of attachment styles across people. While some people are relatively secure in their relationships with their parents, other people can be insecure. In a structured laboratory experiment called “The Strange Situation”, Ainsworth, Blehar, Waters, and Wall (1978) wanted to activate an infant’s attachment system over repeated separations from the caregiver in an unfamiliar environment. Based on this experiment, three attachment patterns were formed: *secure*, *anxious/ambivalent*, and *avoidant*. While securely attached children seek proximity upon their caregiver’s return from a separation, children classified as anxious/ambivalent demonstrate ambivalent behaviours, such as wanting to be comforted but also wanting to punish the caregiver for leaving. Children classified as avoidant avoid proximity and interaction with the caregiver. It is believed that our early experiences with caregivers form the foundation of our close relationships later in life (Bowlby, 1969, 1973, 1980). They are also believed to influence our beliefs about how we should behave towards significant others and our expectations of how we should be treated by them (Hazan & Shaver, 1987).

One of the important aspects of attachment theory is the stability of attachment style and whether it changes over time. Attachment theorists are often concerned with whether people become more secure or less secure in their attachment styles during their lifetime. Our attachment figures are believed to change when we grow older, from parents to friends, and from friends to romantic partners (Cohen, 2004). Although many researchers have investigated the stability of attachment in infancy (Main & Weston, 1981; Waters, 1978), in adolescence (Theisen, Fraley, Hankin, Young, & Chopik, 2018), and in adulthood (Chopik, Edelstein, & Fraley, 2013; Klohnen & Bera, 1998), less is known if current experiences or social environment cause an alteration in one’s attachment security.

In a longitudinal study, Davila, Burge, and Hammen (1997) investigated whether attachment style changes over time and, if so, why? They found that current circumstances can cause a change in attachment style in women who are going through a major life transition, such as entering adulthood after high school. According to their study, romantic stress was associated with fluctuations in secure attachment ratings. This suggests that our perceived environment and experiences might cause an alteration in our attachment style.

In mate choice theory, ‘mate value’ refers to how much demand there is for a particular individual as a mate within a population (Pawłowski & Dunbar, 1999). Mate value can be described as the total amount of characteristics an individual possesses at a given moment, within a specific context that affects their ability to successfully find, attract, and retain a mate (Fisher, Cox, Bennett, & Gavric, 2008). Mate value is usually associated with physical attractiveness (Arnocky, 2018; Li, Bailey, Kenrick, & Linsenmeier, 2002). Individuals with higher mate value can generally afford to be more choosy, but their value will change according to the number of attractive and unattractive individuals within a local mating pool (or market). According to previous studies (Brown, Novick, Lord, & Richards, 1992; Cash, Cash, & Butters, 1983; Kenrick & Gutierrez, 1980; Thornton & Moore, 1993), exposure to others who are more physically attractive generally decreases self-ratings of attractiveness, whereas exposure to less attractive individuals generally increases self-rating of attractiveness. Little and Mannion (2006) also showed that such exposure altered the rating of others in a similar way.

In this study, I exploited these findings to test the short-term sensitivity of attachment anxiety or avoidance to changes in current experience and social environment. Participants’ self-perceived mate value was manipulated by exposing them either to a set of attractive or unattractive faces (or a mixture of these) and the potential for changes in their attachment security was examined. To do this, participants were asked to complete a sensitive self-report questionnaire, the Experiences in Close Relationships-Relationship Structures (ECR-RS) scale (Fraley, Heffernan, Vicary, & Brumbaugh, 2011), both before and after viewing the images. I predict that exposure to attractive faces of the same sex would reduce self-perceived attractiveness scores, and that this would cause a change in attachment security to a romantic partner, making participants more insecure. Conversely, I predict that seeing less attractive same-sex images will cause a boost in participants’ self-perceived mate value and attractiveness, hence will increase the attachment security towards a romantic partner.

2.2 Methods

2.2.1 Participants

A total of 206 heterosexual participants were recruited through the researcher's social media accounts and the university’s participant pool. The latter group received course credit tokens for their participation. Of the participants, 162 were female and 44 were

male. Among women, 50 were randomly allocated to see the attractive image set, 54 to see the mixed set of attractive and unattractive images, and 58 to see the unattractive images. Among men, 15 saw the attractive images, 15 the mixture, and 14 the unattractive same-sex images. The mean age was 23.25 ($SD = 7.44$) and ranged between 18-51 years. Men and women currently in romantic relationships constituted 50% and 46% of the sample, respectively.

2.2.2 Procedure

After providing consent to participate in this study, participants were directed to an online survey, and asked to answer demographic questions including their age, their relationship status (partnered or single), whether their mother or father was absent when they were growing up, and if they recently experienced a breakup with a partner etc. Participants were also asked to rate their overall physical attractiveness by using a sliding scale (0 = not attractive at all, 100 = very attractive). After the demographic questions, participants were asked to answer the ECR-RS questions about their romantic partner and best friend (see below).

Upon completion of the ECR-RS scale, according to their gender, each participant was randomly assigned to one of the 3 prime conditions. Female participants were assigned to see either a set of relatively attractive female faces, relatively unattractive female faces, or a mixture of attractive and unattractive same-sex faces. They were asked to rate each face for attractiveness on a 7-point scale (1 = not attractive at all, 7 = very attractive). As for male participants, they were also randomly assigned to one of the three conditions (relatively attractive male faces, relatively unattractive male faces or a mixture of attractive and unattractive male faces) and then were asked to rate the faces for attractiveness.

After rating the faces, participants were asked to complete the ECR-RS scale for the two attachment figures (partner and friend) for a second time. They also provided a second rating of their self-perceived overall physical attractiveness.

2.2.3 Materials

Creation of composite images

As part of the study, participants were presented a set of images. I used 20 attractive images (10 female) and 20 unattractive images (10 female). See Appendix B for all images.

For the unattractive images, composite images were created (each being a single image derived from two different face photographs) rather than using original faces, because composites are novel and unique and thus avoid issues related to individual recognition. To create these, 50 men and 50 women (aged 18-22) were photographed under standardised lighting conditions. Participants looked straight towards the camera, adopting a neutral expression. Each digital image was standardised for size based on inter-pupillary distance and manually marked around the main features (e.g. eyes, nose and mouth) and around the outline of the face (e.g. hairline, jawline) using dedicated software (Tiddeman, Burt, & Perrett, 2001). Using the outline landmark points, I masked the image to obscure non-facial features (hairstyle, clothing). From these images, 25 composite faces of each sex were created using the following procedure. The 50 male and 50 female images were presented to an independent panel of 50 opposite-sexed raters, with a unique random presentation order for each rater, using a java applet. Raters scored each image for attractiveness on a 10-point Likert scale (1 = very unattractive, 10 = very attractive). Pairs of images were then grouped based on their mean attractiveness ratings, such that those ranked 1 and 2 (the two most attractive images) were paired, the same for those ranked 3 and 4, 5 and 6, and so on). For each pair, the average location of each landmark point on the faces was calculated and the original faces were morphed to this average shape. Next, the 2 images were superimposed to produce a photographic-quality composite image. This technique has been used to create composite images in previous studies (Benson & Perrett, 1993; Little & Hancock, 2002; Tiddeman et al., 2001). Then ten images from each sex with the lowest attractiveness rating were selected to be used in this study.

Attractive images were also facial composites of 5 individual face photographs (aged between 18 and 25) with no spectacles or apparent facial hair (Little & Hancock, 2002). Photographs were taken with participants posing with a neutral expression, under standardized lighting conditions. All images were aligned to standardize the position of the pupils in the image to equate size (Little, DeBruine, & Jones, 2010).

For the mixed condition, 5 images from each of the attractive and unattractive faces for each sex were randomly selected (see Figure 2.1).

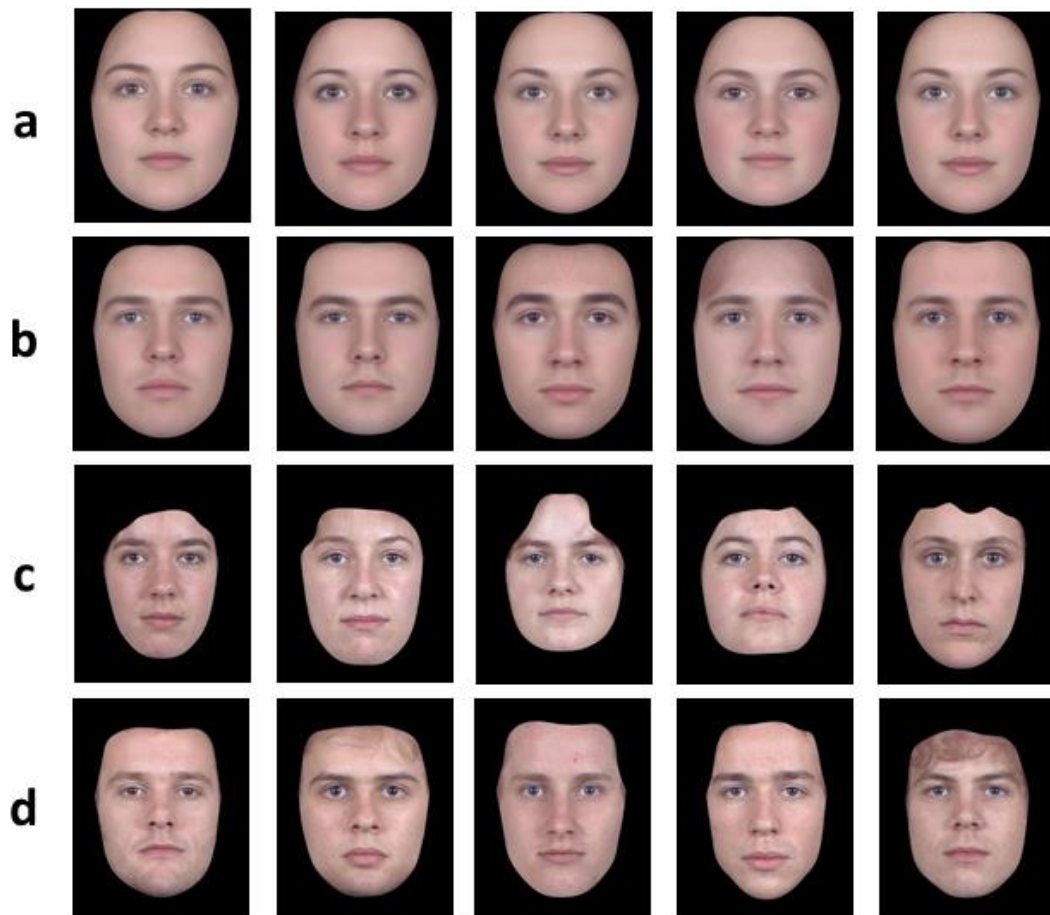


Figure 2. 1 Example of the attractive (a,b) and unattractive (c,d), female (a,c) and male (b,d) faces used in this study

To check that variation in attractiveness in the original images was retained in the composite set, 12 new raters (6 male, 6 female; aged 22-30) were asked to score the male and female composites for attractiveness (again, in unique randomised order). Then, the mean attractiveness score for each composite with its ranking from the initial rating procedure was correlated, using one-tailed Spearman rank correlation. There was a strong positive correlation between the composite images' ratings and the rank of the originals from which they were produced (male faces: $\rho = .546$, $p = .002$; female faces $\rho = .788$, $p < .0001$). In other words, composites produced from highly attractive original images were also attractive, relative to those produced from less attractive original images.

Attachment security measure

The Experiences in Close Relationships (Relationship Structures)- ECR-RS Scale (Fraley et al., 2011) has been used to assess participants' attachment in two dimensions; attachment-related *anxiety* and attachment-related *avoidance*. The ECR-RS is a 7-point,

self-report questionnaire (1 = strongly disagree, 7 = strongly agree) designed to assess attachment in close relationships with father, mother, romantic partners and close friends (Rocha, Peixoto, Nakano, Motta, & Wiethaeuper, 2017). The questionnaire contains 9 items that assess attachment in each of those four domains, thus 36 items in total. Items 1-6 measure attachment *avoidance*, the first 4 items being reverse-keyed, and items 7-9 measure attachment *anxiety*. The anxiety dimension represents attachment-related concerns, such as the availability and responsiveness of an attachment figure, while the avoidance dimension represents feeling uncomfortable about opening up to others and depending on them. Example items for anxiety are “I am afraid this person may abandon me”, and “I worry that this person won’t care about me as much as I care about him or her”. Example items for avoidance are “I don’t feel comfortable opening up to this person” and “I prefer not to show this person how I feel deep down (Theisen et al., 2018). See Appendix A for the complete ECR-RS scale. The ECR-RS is one of the widely used assessment methods in attachment studies. Low scores of anxiety and avoidance are seen as an indication of secure attachment. High scores on attachment anxiety and avoidance represent a high level of attachment insecurity. In this study, participants completed these items thinking about a partner and a friend. To check the reliability of the scale Cronbach’s alpha analysis was run. Cronbach’s alpha reliability estimates in this sample were the following: “partner domain” $\alpha_{\text{avoid}} = 0.84$, $\alpha_{\text{anx}} = 0.91$; “friend domain” $\alpha_{\text{avoid}} = 0.87$, $\alpha_{\text{anx}} = 0.93$.

This scale will be used to assess attachment-related anxiety and avoidance in the following chapters (chapter 3, 4, 5 and 6).

2.2.4 Statistical analysis

The average scores of attachment avoidance and anxiety for partner and friend were calculated. In the current analysis, I included only heterosexual participants because homosexuals might see the same-sex images as potential partners rather than competitors, which could significantly alter their behaviour. I calculated the change in attachment anxiety and avoidance scores before and after the image exposure by subtracting pre-condition scores from post-condition scores, so that positive scores indicate an increase in attachment avoidance/anxiety and negative scores indicate a decrease in attachment avoidance/anxiety.

A general linear model was used separately for attachment anxiety and avoidance dimensions. In the first model the dependant variable was person with 2 levels; change in

partner anxiety and friend anxiety. Independent variables were gender and image condition (attractive, mix, unattractive). In the second model, the dependent variable was person with 2 levels; change in partner avoidance and friend avoidance (person) and independent variables were gender and image condition. Similarly, another general linear model was run to test the influence of self-perceived attractiveness. The dependent variable was time with 2 levels; pre and post self-perceived attractiveness scores, and independent variables were gender and image condition.

Separate univariate ANOVA tests were conducted for additional exploratory analyses to investigate effects of relationship status and recent break-up in men and women. These analyses were run separately for avoidance and anxiety dimensions. For relationships status, the dependent variable was partner anxiety/avoidance and independent variables were relationship and condition. And for recent break up experience, the dependent variable was partner anxiety/avoidance and independent variables were recent break up experience and condition.

2.3 Results

2.3.1 *The effects on attachment avoidance and anxiety*

First, I tested whether attachment avoidance and anxiety towards a partner/friend were influenced by seeing the same-sex attractive, a mixture of attractive and less attractive, and unattractive images. There was no main effect of image condition on men and women's attachment anxiety $F(2, 200) = 1.33, p = .27$, partial $\eta^2 = .01$ and avoidance $F(2, 200) = .09, p = .92$, partial $\eta^2 = .00$. However, there was a significant interaction effect between the attachment figures (partner/friend) and the image condition on attachment avoidance $F(2, 200) = 4.79, p = .01$, partial $\eta^2 = .05$. The effect of image condition on attachment avoidance was different for a partner and friend. In the attractive image condition, participants increased their partner attachment avoidance and decreased their friend attachment avoidance scores, while participants in other conditions had relatively similar partner and friend attachment avoidance scores. The person $\times$ condition $\times$ gender interaction was also significant $F(2, 200) = 4.17, p = .02$, partial $\eta^2 = .04$. Men increased their attachment avoidance scores towards their partner after seeing attractive same-sex images and decreased their attachment avoidance score to a friend (see Figure 2.2a) while women gave relatively similar attachment avoidance scores for partner and friend after seeing attractive same-sex images (see Figure 2.2b). On the contrary, there was no

significant interaction effect between the type of attachment figures, the image condition and the gender of participants on attachment anxiety $F(2, 200) = 1.87, p = .16$, partial $\eta^2 = .02$.

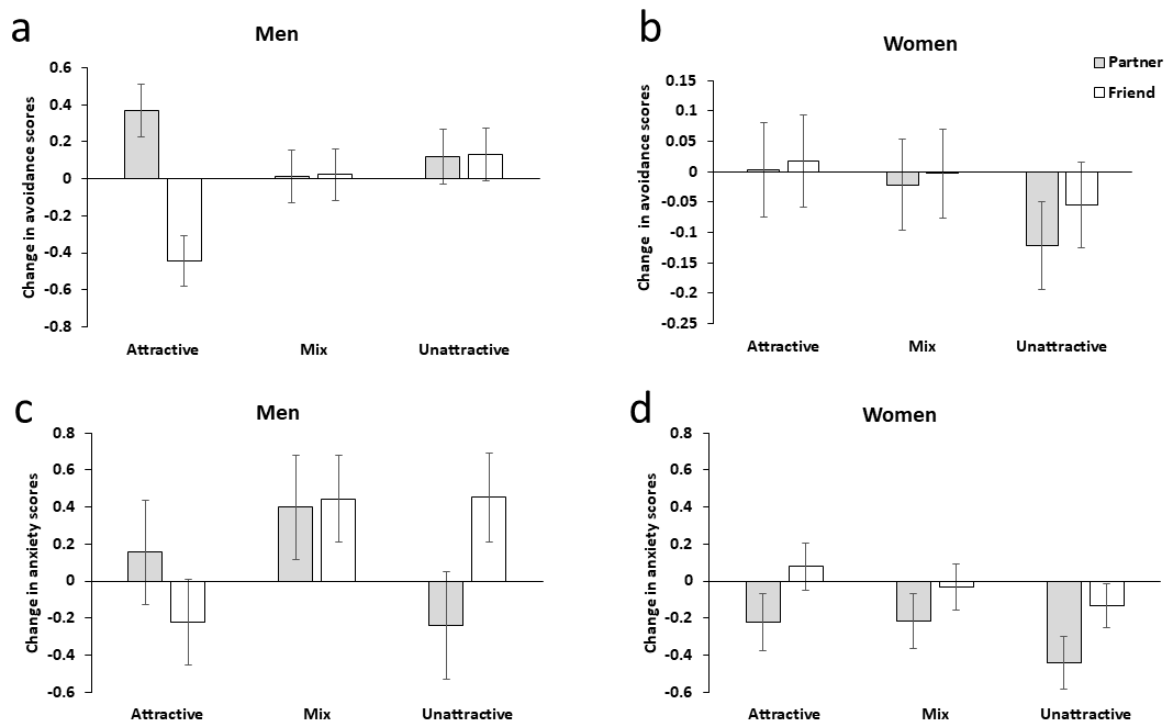


Figure 2. 2 Mean ($\pm$ s.e.) change in partner and friend attachment avoidance (a,b) and attachment anxiety (c,d) scores after the image condition among men (a,c) and women (b,d)

2.3.2 Relationship status

Next, I explored whether current relationship status would have an influence on participants' attachment-related anxiety and avoidance towards a partner. Current relationship status had no significant main effect on women's partner attachment anxiety $F(1,155) = .92, p = .34$, partial $\eta^2 = .01$, and there was no significant interaction effect between relationship status and condition $F(2, 155) = .01, p = .99$, partial $\eta^2 = .00$. Similarly, there was no significant main effect of relationship status $F(1,155) = 1.66, p = .2$, partial $\eta^2 = .01$ or interaction effect between relationship status and condition on women's partner attachment avoidance $F(2,155) = 2.03, p = .14$, partial $\eta^2 = .03$.

The same pattern occurred in men. There was no significant main effect of current relationship status on partner attachment anxiety $F(1,37) = .42, p = .52$, partial $\eta^2 = .01$,

and no significant interaction effect between relationship status and condition $F(2, 37) = .47, p = .63$, partial $\eta^2 = .03$. Also, there was no main effect of relationship status $F(1,37) = 1.99, p = .17$, partial $\eta^2 = .05$ and no significant interaction effect on partner attachment avoidance $F(2, 37) = .32, p = .73$, partial $\eta^2 = .02$. Being partnered or single did not influence participants' attachment security towards a partner. Both partnered and single participants reported relatively similar partner attachment anxiety and avoidance scores after the image conditions.

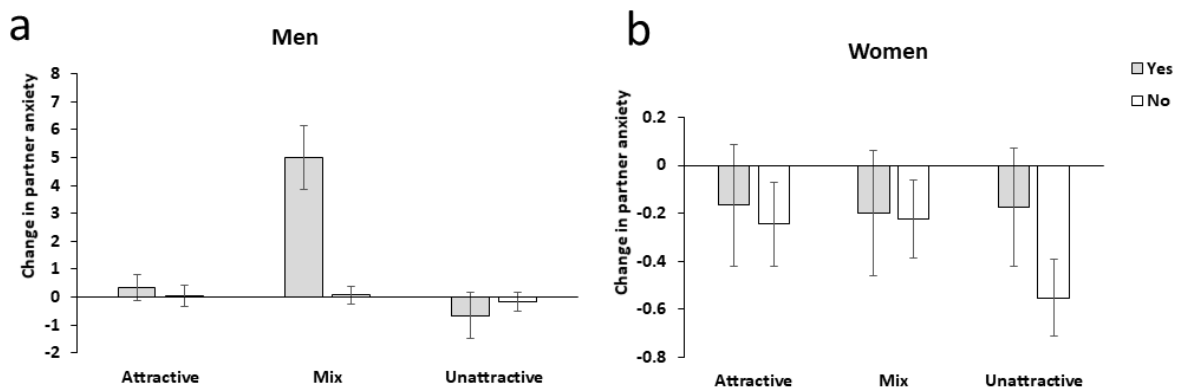


Figure 2.3 Mean ($\pm$ s.e.) change in partner attachment anxiety scores after the image condition among men (a) and women (b) and whether they have had a recent breakup

I then tested whether experiencing a recent breakup was associated with partner attachment security. There was no significant main effect of the recent breakup experience on partner attachment avoidance both in men $F(1,38) = 3.09, p = .09$, partial $\eta^2 = .08$ and women $F(1,156) = 3.87, p = .05$, partial $\eta^2 = .02$. Results did not yield a significant interaction effect between recent breakup experience and condition $F(2, 38) = .41, p = .67$, partial $\eta^2 = .02$ on partner attachment avoidance in men and women $F(2, 156) = 1.70, p = .19$, partial $\eta^2 = .02$. For attachment-related anxiety, there was a significant main effect of breakup on partner attachment anxiety in men $F(1,38) = 8.66, p = .01$, partial $\eta^2 = .19$. Partner attachment anxiety scores were higher in men who had a recent breakup compared to ones who had not. There was also a significant interaction effect between a recent breakup experience and the image condition $F(2, 38) = 7.39, p = .002$, partial $\eta^2 = .28$ in men. Men who reported a recent breakup experience significantly increased their partner attachment anxiety scores after seeing a mixture of attractive and unattractive same sex images (see Figure 2.3a). In contrast, there was no significant main effect of recent breakup $F(1,156) = .82, p = .37$, partial $\eta^2 = .01$ and interaction effect between recent

breakup experience and condition on women's partner attachment anxiety $F(2,156) = .4, p = .67$, partial $\eta^2 = .01$.

2.3.3 Self-perceived attractiveness

Finally, I tested whether seeing same-sex attractive images would alter participants' self-perceived attractiveness as predicted. I measured participants' self-perceived attractiveness twice, before and after the image condition. Somewhat surprisingly, the general linear model indicated no significant interaction effect of time x condition x gender $F(2, 198) = .24, p = .79$, partial $\eta^2 = .002$. Both men and women gave relatively similar self-perceived attractiveness scores in each condition and there was not a significant change in their self-perceived attractiveness scores after seeing the images (see also Table 2.1).

Table 2. 1 The self-perceived attractiveness mean ($\pm$ s.e.) scores before and after the image condition

Condition	Self-perceived attractiveness				Self-perceived attractiveness			
	Pre-condition				Post-condition			
	Women		Men		Women		Men	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
Attractive	52.88	2.67	57.47	4.88	52.14	2.76	57.2	5.04
Mix	50.34	2.6	59.33	4.88	49.32	2.68	59.47	5.04
Unattractive	54.3	2.5	66.93	5.05	54	2.56	66.36	5.22

Note. $n=162$ women, $n= 44$ men. $p>0.05$

2.4 Discussion

The aim of this study was to determine whether and how attachment-related anxiety and avoidance change over the short term, depending on our current experience and perceived social environment. Specifically, I was interested in the influence of a change in self-perceived mate value. Mate value is a function of attractiveness and desirability of a person as a potential mate (Brase & Guy, 2004) and self-perceived mate value is about one's own mate value compared to potential competitors (Goodwin et al., 2012). Therefore, in this study, I hypothesised that seeing attractive same-sex images (potential competitors) would affect participants' self-perceived mate value and that they would consequently be more insecure in their attachment towards a partner.

This expectation was based on previous studies (Brown et al., 1992; Cash et al., 1983; Kenrick & Gutierrez, 1980; Little & Mannion, 2006; Thornton & Moore, 1993) which suggest that exposure to others who are more physically attractive generally

decreases self-rating of attractiveness, whereas exposure to less attractive individuals results in an increase in self-perceived mate value. However, contrary to my expectations, I did not find a significant difference between participants' self-rated attractiveness scores before and after exposure to the images. It appears that the intervention did not manipulate self-perceived mate value as much as I anticipated, perhaps because of methodological differences in either the nature of the face stimuli or the number of these (for example, we used 10 images compared to 20 in Little and Mannion's (2006) study). However, this does not necessarily mean that there was no alteration in self-perceived mate value; it is possible that this was indeed elicited but that our measure of self-perceived attractiveness was not sufficiently sensitive to detect it. It is also possible that the manipulation caused alteration in other forms of self-perception, such as self-esteem, which I did not measure. Thus, despite this unexpected result, it remains possible that the manipulation could have had effects on attachment.

Indeed, the results showed that viewing attractive same-sex images had a significant effect on attachment-related avoidance towards a partner in men. Men who were allocated to see a series of attractive competitors increased their attachment avoidance scores to their partner compared to a friend. In other words, men were more likely to find their partner hard to depend on and get close to. One possible explanation for this might be due to effects on mate value or self-esteem. Previous research reported a positive correlation between overall self-perceived mate value and global self-esteem (Brase & Guy, 2004; Surbey & Brice, 2007). Individuals who believe that they possess few qualities valued by the market place feel less confident about their skills to find a marital partner (Bredow, Huston, & Glenn, 2011). Thus, men who saw attractive images might become more avoidant to a partner in order to prevent a possible rejection, because they felt less confident.

On the contrary, there was no change in women's partner attachment security after seeing attractive same-sex faces. Women compete in terms of attractiveness as it is the main criterion used by men when selecting mates. Furthermore, women use derogation - any act designed to reduce the perceived value of a rival, as a competitive strategy (Fisher, 2004). Therefore, women might be more used to these kinds of manipulations and hence, seeing attractive competitors has less effect.

The exploratory analyses revealed that men who reported a recent breakup with their partner showed higher attachment-related anxiety towards a partner after seeing a mixture of attractive and unattractive same-sex images. It is possible that a combination of

altering participants' self-perceived mate value with a mixture of attractive and unattractive images of potential competitors and a recent breakup from a partner might cause fear of abandonment and hence, participants increased their anxiety scores towards a partner. When the same attachment-related questions were asked for the second time, men may have been more worried that their partner would not care about them as much as they do, and were fearful that their partner would abandon them. These results seem to be consistent with other research which found men to become less secure after experiencing a breakup with a partner (Ruvolo, Fabin, & Ruvolo, 2001). Unlike men, women who have experienced a recent breakup with a partner did not become more anxious or avoidant towards a partner after seeing same-sex attractive images. This may be because men might be more strongly emotionally affected by the dissolution of a relationship which may influence their attachment security (Bloom & Caldwell, 1981). Furthermore, women tend to have more confidants apart from their partners, which might help them overcome a relationship dissolution more easily than men do (Kurdek, 1989). On the other hand, current relationship status was not predictive of change in attachment-related anxiety or avoidance, both in men and women.

Close relationships are important in people's lives, especially in young adults. Understanding relationships and how feelings about partners change, over both the short and long term, can help individuals to shape their own view of themselves and others around them, and prepare them for future relationships. This study shows that even against a backdrop of stable attachment style, bestowed on them by relationships with parental figures in their past, young people are also affected by rather subtle current influences in their current experience and social environment. Further work is now needed to further explore other forms of current experience on attachment security in romantic relationships, and how pervasive and long-lasting they may be.

Chapter 3: Does variation in operational sex ratio influence partner attachment security?

3.1 Introduction

The sex ratio of species is believed to be usually nearly balanced between males and females (Darwin, 1871). As each offspring has one mother and one father, on average males and females in a population would have equivalent reproductive success. If one sex surpluses the other one, the production of the rare sex would be advantageous, facilitating a stable balance. The numerical balance of males and females occurs on an evolutionary time scale. Since Darwin (1871), researchers documented imbalanced sex ratios in particular human populations.

The operational sex ratio (OSR) is defined as the ratio of sexually active males to females who are ready to mate (Kvarnemo & Ahnesjö, 1996). Emlen & Oring (1977) identified the OSR as the number of sexually active males per 100 sexually active females. Thus, an OSR of 100 will indicate a perfectly balanced sex ratio: there will be one man for every woman (Kruger & Fitzgerald, 2012). The OSR is believed to be the key component of sexual selection (Clutton-Brock & Parker, 1992; Emlen & Oring, 1977; Reynolds, 1996). Therefore, a bias in OSR can predict the intensity of the mate competition and the sex that will compete for access to mates. For instance, when the OSR deviates from equality, more intense mating competition is expected. The more abundant sex will be the predominant competitor for access to mating partners (Kvarnemo & Ahnesjö, 1996) and the rare sex will be more valuable in the mating market (Fisher, 1958).

When the number of available men outnumbers available women, the OSR becomes male-biased. As there would be lots of available men to choose from, women will have the freedom of choice. It is believed that in a male-biased population, women will be highly valued. Therefore, the shortage of available women will increase the intrasexual competition among men. Men will use their status to impress women and will be more inclined to make long-term relationship commitments (Guttentag & Secord, 1983). Hence, they will not only compete for a reproductive partner, but will also compete for a higher social status to attract and retain women (Kruger & Fitzgerald, 2012).

On the other hand, researchers believe that where women are abundant, men will be less inclined to provide long-term relationship commitment and parental investment as their scarcity will enhance their short-term mating success (Pedersen, 1991). When the OSR is female-biased, women have less power of choice. In female-biased populations, women could be seen as sex objects by men who are interested in short term sexual relationships rather than a commitment. Researchers suggest that the abundance of available women will allow men to move from one woman to another and be promiscuous.

Adultery would be commonplace (Guttentag & Secord, 1983). In contrast, in low sex ratio (female-biased) populations, women would need to compete to get a partner. Women compete through signals of sexual availability and fecundity (Cunningham, 1986). Guttentag & Secord (1983) stated that in a female-biased OSR, women need to increase their mating efforts to attract and retain a man. However, while some women redouble their efforts to get a man, others might feel powerless and resentful. Hence, instead, they would focus on their economic independence and promote feminism.

As an imbalanced OSR within a population influences gender roles and function of relationships (Secord, 1983), in this study, I wanted to investigate whether variation in OSR would also influence the partner attachment security. Participants' OSR was varied by allocating them to see either female-based, male-biased or equal ratio of female and male faces. I hypothesised that women in female-biased and men in male-biased OSR condition would increase their partner attachment anxiety due to the intrasexual competition (Kvarnemo & Ahnesjö, 1996). I also predicted that women in male-biased and men in female-biased OSR condition would increase their partner attachment avoidance as the scarce sex has more power in the mating market and they will see faces of many available potential mates to choose from (Fisher, 1958). According to my knowledge, this is the first study that investigates the effects of variation in OSR on partner attachment security.

3.2 Methods

3.2.1 Participants

Two hundred heterosexual participants were recruited through the researcher's social media accounts and the University of Stirling's online recruitment platform Psychweb. The participants consisted of 61 men ($N=23$ in the female-biased, $N=20$ equal, and $N=18$ in the male-biased condition) and 139 women ($N=44$ in the female-biased, $N=47$ equal and $N=48$ in the male-biased condition). The mean age of the participants was 23.72 ($SD = 8.39$). At the time of the study 55.5% of the participants reported to be partnered, 43% single and 1.5% preferred not to answer. Ethical approval was obtained from the University of Stirling, General University Ethics Panel (GUEP).

3.2.2 Materials

Attachment security measure

Attachment security was assessed by the same self-report scale used in Chapter 2; the Experiences in Close Relationships - Relationship Structures (ECR-RS) (Fraley, Heffernan, Vicary, & Brumbaugh, 2011). In this study, the ECR-RS scale was administered with respect to a romantic partner (see chapter 2.2.3 for more details). Cronbach's alpha reliability estimates in this sample for "partner domain" were $\alpha_{\text{avoid}} = 0.84$, $\alpha_{\text{anx}} = 0.87$.

Stimuli

The same composite images as used in chapter 2 were used in this study to manipulate the perceived operational sex ratio of the participants. In the female-biased condition, there were 15 female and 5 male images; in the male-biased condition there were 15 male and 5 female images, and in the equal condition, there were 10 female and 10 male faces (see Appendix C for all images).

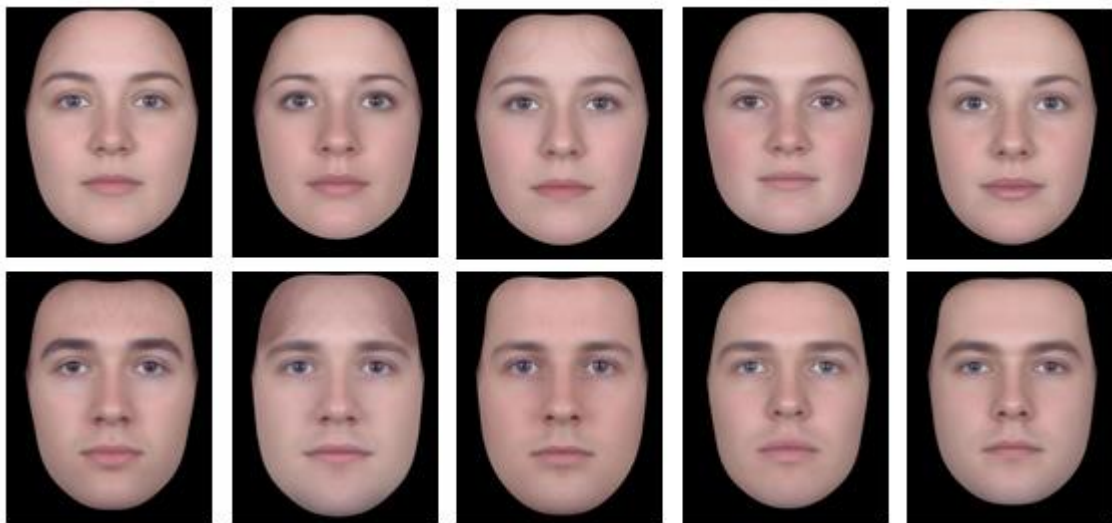


Figure 3. 1 Example of the female (top) and male (bottom) faces used in this study

3.2.3 Procedure

The study was built online in Qualtrics and the link was distributed through social media and university participant recruitment platform Psychweb. Participants' consent was obtained before commencing the study. The study began with demographic questions, including items asking for participants' sex, age, relationship status, the experience of a recent breakup, and if they ever had a partner breaking up with them. Following these items, participants were asked to rate their self-perceived attractiveness on a scale of 0 to

100 (0 = very unattractive, 100 = very attractive). After that, participants were asked to complete the ECR-RS scale that assesses attachment-related anxiety and avoidance for a partner. Each item was rated on a 1 (strongly disagree) and 7 (strongly agree) scale. The participants were then randomly assigned to one of the following conditions: 1) exposed to female-biased images, 2) male-biased images or 3) equal ratio of female and male faces and they were asked to rate those faces for attractiveness on a scale of 1 to 7 (1 = very unattractive, 7 = very attractive). After the images, participants were asked to rate their self-perceived attractiveness and answer the same ECR-RS questions for a partner again.

3.2.4 Statistical analysis

All analyses were carried out using SPSS, version 24. Only heterosexual participants were included in this study, as homosexuals might see same-sex images as potential partners instead of competitors. Average scores of partner attachment anxiety and avoidance were calculated separately for each participant. The change in attachment anxiety and avoidance scores was calculated by subtracting pre-condition scores from post-condition scores. Positive scores indicated an increase in attachment avoidance and anxiety, and negative scores indicated a decrease. These difference scores were used as variables in the analyses below.

A two-way ANOVA was carried out separately for partner attachment anxiety and avoidance (DV), gender and condition (female-biased, male-biased and equal) being between-subject factors (IVs).

To explore the data further, two-way ANOVA analyses were conducted separately for partner anxiety and avoidance dimensions to analyse the effects of relationship status, recent breakup and self-perceived attractiveness in men and women. For relationship status, the dependent variable was partner anxiety/avoidance and independent variables were relationship status and condition. For recent break up, the dependent variable was partner anxiety/avoidance and the independent variables were recent break up experience and condition. As for self-perceived attractiveness, the dependent variable was the self-attractiveness score and the independent variables were gender and condition.

3.3 Results

3.3.1 *The effects on partner attachment anxiety and avoidance*

First, I tested whether partner attachment anxiety and avoidance were influenced by perceived operational sex ratio. I constructed a general linear model with condition and gender being between-subject factors. There was no statistically significant interaction effect between gender and condition on partner attachment anxiety scores, $F(2,194) = .022$, $p = .98$, partial $\eta^2 < .001$ and there was no significant main effect of gender $F(1, 194) = .547$, $p = .46$, partial $\eta^2 = .003$ or condition $F(2,194) = 1.686$, $p = .19$, partial $\eta^2 = .017$ on partner attachment anxiety.

There was no significant interaction effect of gender and condition on partner attachment avoidance scores either, $F(2,194) = 1.029$, $p = .36$, partial $\eta^2 = .010$. No significant main effect of gender $F(1,194) = .201$, $p = .654$, partial $\eta^2 = .001$ and condition $F(2,194) = 1.014$, $p = .37$, partial $\eta^2 = .010$ were found.

3.3.2 *Relationship status*

Next, I tested whether being partnered or single would influence the partner attachment security after the manipulation of varied perceived sex ratio. The results yielded a statistically significant interaction between partnership and condition on partner attachment avoidance scores in men, $F(2, 54) = 4.246$, $p = .019$, partial $\eta^2 = .136$, but not in women $F(2, 131) = .638$, $p = .53$, partial $\eta^2 = .010$. As shown in Figure 3.2b this interaction in men was mainly driven by the difference in partner attachment avoidance scores between partnered and single men in female-biased condition $F(1, 54) = 5.845$, $p = .019$, partial $\eta^2 = .098$. Partnered men in the female-biased condition significantly increased their partner attachment avoidance scores.

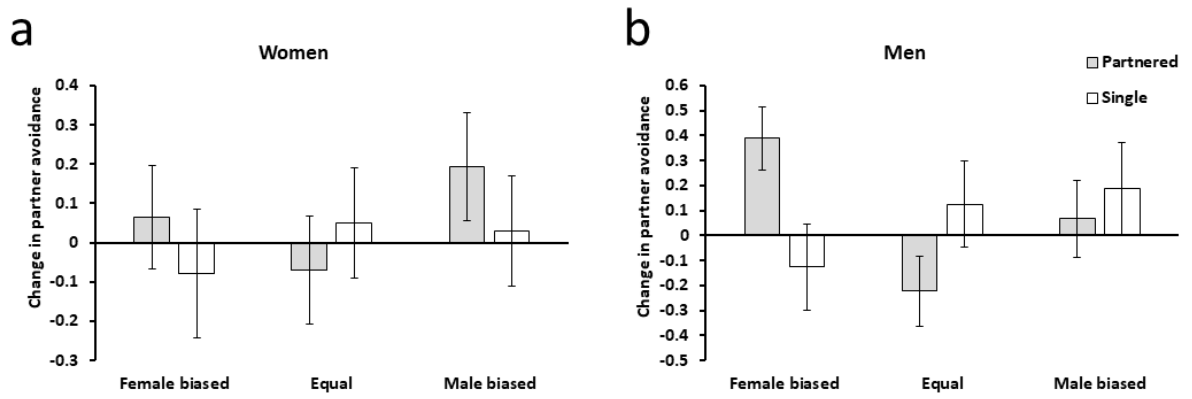


Figure 3. 2 Mean ($\pm$ s.e.) change in partner attachment avoidance scores among partnered and single women and men

However, there was no statistically significant interaction effect between partnership and condition on partner attachment anxiety scores both in men $F(2, 54) = 1.548, p = .22$, partial $\eta^2 = .054$ and women $F(2, 131) = .337, p = .72$, partial $\eta^2 = .055$. The effect of condition was same for partnered and single participants.

3.3.3 Recent breakup

Then, I explored whether experiencing a recent breakup would affect partner attachment security after being exposed to varied operational sex ratio. There was a statistically significant interaction between recent breakup experience and condition on partner attachment avoidance scores in women, $F(2, 130) = 4.034, p = .02$, partial $\eta^2 = .058$ but not in men $F(2, 55) = 2.400, p = .10$, partial $\eta^2 = .058$. An analysis of simple main effects for the condition was performed with statistical significance receiving a Bonferroni adjustment and being accepted at the $p < .025$ level. There was a statistically significant difference in partner attachment avoidance scores between women who had a recent breakup and women who did not, who were in female-biased condition $F(1,130) = 6.403, p = .013$, partial $\eta^2 = .047$ (see Figure 3.3a). Women who were in female-biased condition and reported to have a recent breakup significantly decreased their partner attachment avoidance scores.

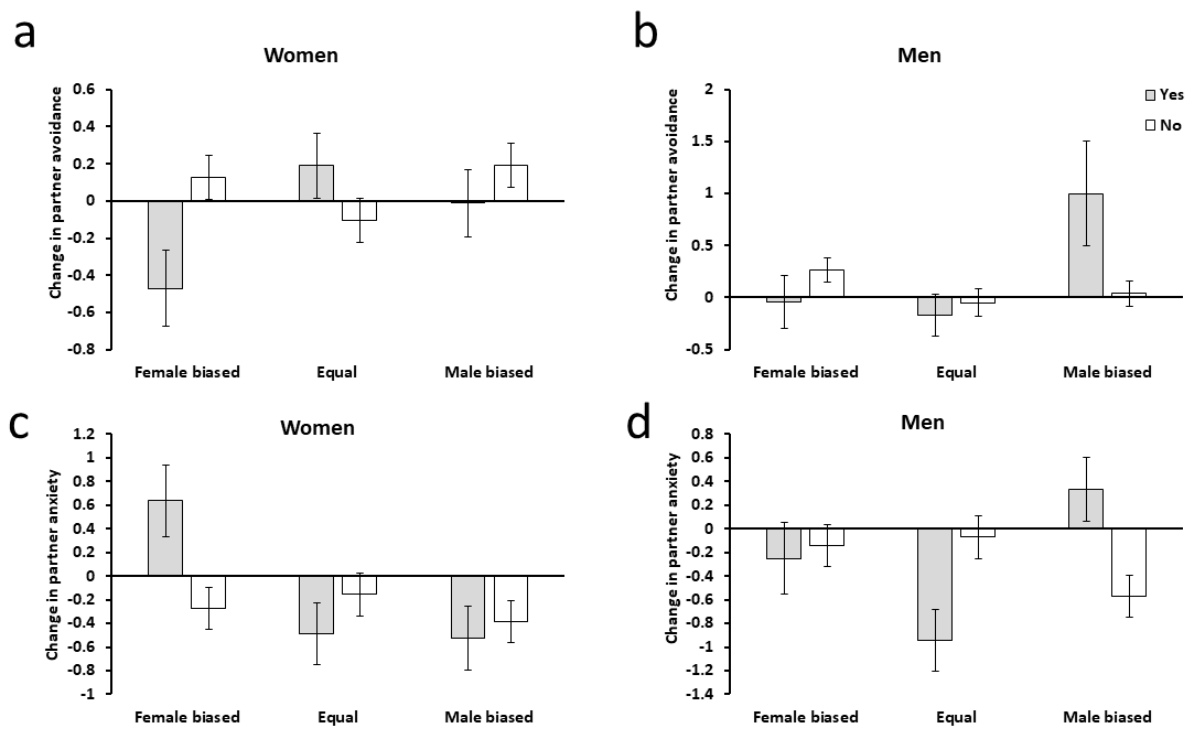


Figure 3.3 Mean ($\pm$ s.e.) change in partner attachment avoidance (a,b) and attachment anxiety (c,d) scores of women and men who had a recent breakup

I also found a statistically significant interaction between recent breakup experience and condition on partner attachment anxiety scores, in women $F(2, 130) = 3.817, p = .024$, partial $\eta^2 = .055$ but not in men $F(2, 55) = 1.75, p = .18$, partial $\eta^2 = .055$. There was a statistically significant difference in partner attachment anxiety scores between women who had a recent breakup and women who had not, who were in the female-biased condition, $F(1, 130) = 6.595, p = .011$, partial $\eta^2 = .048$ (see Figure 3.3c). Women who were in female-biased condition and reported a recent breakup significantly increased their partner attachment anxiety scores.

3.3.4 Self-rated attractiveness

Participants' self-rated attractiveness was measured before and after the condition. I calculated the difference score by subtracting pre self-rated attractiveness scores from post attractiveness scores.

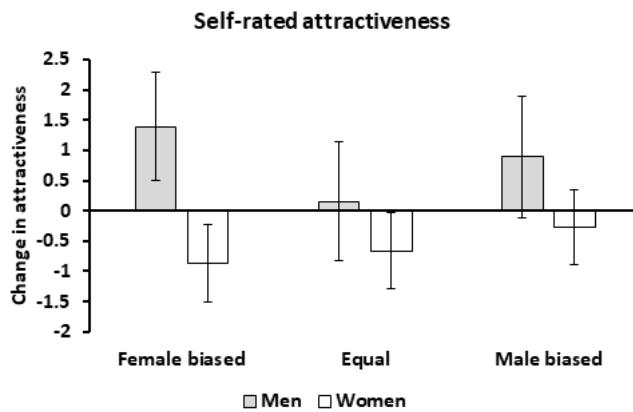


Figure 3. 4 Mean ($\pm$ s.e.) change in self-rated attractiveness of women and men

There was no statistically significant interaction between gender and condition on self-rated attractiveness scores $F(2,192) = .448, p = .64$, partial $\eta^2 = .005$. However, the main effect of gender was significant $F(1, 192) = 4.561, p = .034$, partial $\eta^2 = .023$. Post manipulation, men rated themselves significantly more attractive than women.

3.4 Discussion

Imbalanced OSR influences the gender roles and the structure of relationships between men and women (Guttentag & Secord, 1983). Therefore, the main purpose of this study was to assess the influence of variation in OSR on partner attachment security.

In this study, participants' partner attachment anxiety and avoidance were measured before and after the manipulation of OSR. The perceived OSR was manipulated by showing participants either female-biased, male-biased or equal proportion of male and female faces. The data showed that partnered men in female-biased condition were significantly more avoidant towards a partner compared to single men. Partner avoidance is about avoiding intimacy and long-term relationship commitment (Bartholomew, 1990). As previously stated, in female-biased populations where women are plentiful than men, men are less incentive to provide relationship commitment (Pedersen, 1991) and more interested in a sexual affair (Kruger & Fitzgerald, 2012). Especially men in early adulthood, in a modern female-biased population, want to avoid committed relationship due to abundant mating opportunities (Gangestad & Simpson, 2000). Instead, they look for short-term sexual relationships and tend to be more promiscuous. Therefore, seeing

potential attractive women to mate with must have been more effective on partnered men and influenced their partner attachment security.

As women have more selective power in high sex ratio populations (male-biased OSR) (Kruger & Schlemmer, 2009), I was expecting women in the male-biased condition to be more avoidant towards a partner as there would be many other potential partners to choose from. However, on the contrary, there was no change in partner attachment security of women in male-biased condition. Men compete for women in terms of resource acquisition and signals of willingness to long-term commitment (Kruger & Schlemmer, 2009). Furthermore, higher social status and economic power increase men's reproductive success (Hopcroft, 2006). In this study, participants' OSR was varied by showing them female and male faces. Therefore, maybe seeing only male-biased faces was not enough to manipulate women's OSR. A future study may consider including a piece of information about men's social and socio-economic status alongside the faces.

The exploratory analyses revealed that women in the female-biased condition who reported a recent breakup with a partner were less avoidant and more anxious towards a partner compared to women in the male-biased and equal condition. The competition among women for male partners in female-biased populations is more intense (Kruger & Fitzgerald, 2012). The scarcity of men makes it more difficult for women to find and retain a potential mate. Therefore, skewing the OSR towards female-biased must have made women in that condition to be more anxious (hence less avoidant) towards a partner. Attachment anxiety is associated with fear of abandonment (Collins, 1996) and loss of a partner is known as being a traumatic and upsetting life event (Bowlby, 1969). Romantic stress is also associated with fluctuations in attachment security (Davila, Burge, & Hammen, 1997). Therefore, being in a female-biased OSR condition and seeing female competitors after experiencing a relationship dissolution must have made women become more anxious towards a partner.

As with all studies, there are some limitations in the methodology of this study. For example, only female and male faces were used to vary the participants' perceived OSR. In the female-biased condition, there were 15 female and 5 male faces, in the male-biased condition there were 15 male and 5 female faces and in the equal condition, 10 female and 10 male faces were used. Men and women have different mate preferences. For instance, men prefer psychically attractive and young women that signal fecundity, while women prefer men with high social status and good finances (Buss, 1989; Toro-Morn & Sprecher, 2003). Therefore, in a future study, it would be beneficial to provide some information

about the social status and finances along with the male faces. Also, it would be ideal to use only attractive female faces with the information of their age that indicates fertility. Partner attachment security was measured before and after a variation of OSR. However, a future study instead can measure the partner attachment security of participants in imbalanced sex ratio populations directly to see whether there would be a difference in terms of attachment security in biased OSR populations.

In conclusion, this study helps us to understand the effect of the OSR on partner attachment security in relationships. The findings also clarify how the current relationship status and gender moderate the relationship between the OSR and partner attachment security. Furthermore, this study creates a new pathway for understanding attachment in adulthood and the evolutionary factors that influence it.

Chapter 4: Does exposure to relationship breakdown cues influence partner attachment security?

4.1 Introduction

Romantic love is considered to be an attachment process. Hazan and Shaver (1987) suggested that the same attachment patterns of infancy (secure, anxious, avoidant) are repeated in adulthood with romantic partners. When committed romantic relationships form, the partner becomes the preferred source of security (Hazan & Zeifman, 1994). Furthermore, it has been argued that romantic relationships demonstrate the same attachment functions that occur in infancy, such as; *proximity seeking*, *safe have*, *separation protest* and *secure base*. The desire to be with partners considered as *proximity seeking*, searching for comfort from partners in hard times as *safe haven*, becoming distressed when relationship needs are not met as *separation protest*, and the sense of security in relationships considered to be the *secure base* (Ainsworth, 1989; Weiss, 1986).

Romantic relationships play a crucial role in young adults' lives. As romantic love considered to be an attachment process, we expect individuals' attachment characteristics to be affected by romantic partners and relationships. Bowlby (1980) stated that attachment is relatively stable, however, could be changed depending on life experiences. Many studies indicated a change in attachment orientations in adulthood following stressful and traumatic events (Horesh, Cohen-Zrihen, Dor, & Solomon, 2014). For instance, a longitudinal study found a change in attachment stability from infancy to adulthood following a negative life event, such as loss of a parent and parental divorce (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000).

Relationship dissolution is one of the most stressful and traumatic life events in individuals' lives (Tashiro, Frazier, & Berman, 2006). The link between negative relationship experiences and attachment stability has been investigated by many researchers. A study conducted by Feeney and Noller (1992) investigated the implications of attachment styles in relation to relationship dissolution. They reported that individuals endorsing the avoidant attachment style were most likely to experience relationship dissolution. In a similar longitudinal study, Kirkpatrick and Hazan (1994) studied the link between relationship dissolutions and change in attachment styles. Couples constituted their sample and were categorised as secure, insecure and avoidant. The categorisation was made in two time points, 4 years apart. They investigated whether the incidence of a relationship breakup can predict the change in individuals' attachment styles. They found that secure individuals who did not experience a breakup were more likely to stay secure, while the ones who experienced a breakup switched to an insecure attachment style. A more recent study investigating the relationship experiences and change in attachment

characteristics found dating women to become less secure after a relationship dissolution. Similar findings were found in men who initially had insecure attachment characteristics (Ruvolo, Fabin, & Ruvolo, 2001).

As relationship experiences, especially breakups, impact attachment styles, the current study will examine whether exposure to subtle cues of breakup would influence the partner attachment security. In contrast to previous research, this study will test the influence of the subtle relationship breakdown cues on attachment security as opposed to an actual breakup, which will enable us to test how sensitive and responsive our attachment is to relationship dissolutions. In addition, contrary to previous research, this study focuses on change in continuous attachment characteristics (*anxiety, avoidance*) in the short-term, rather than a change in attachment styles. The continuous measure will allow us to detect differences in the degree to which an attachment dimension applies to the person, as categorical measures are less capable to detect change (Fuller & Fincham, 1995).

Participants' attachment security will be tested both before and after a manipulative condition about relationships. I predict that exposure to relationship breakdown cues will make participants more insecurely attached to their partner. Besides examining whether exposure to relationship breakdown cues changes partner attachment security, this study also explores whether such changes are also influenced by a recent breakup experience. I predict that individuals who have experienced a recent breakup and were exposed to relationship breakdown cues will be more insecurely attached to a partner compared to individuals who did not experience a recent breakup.

4.2 Methods

4.2.1 Participants

A total of 281 participants ($F = 165$, $M = 116$) were recruited online via the researcher's social media accounts. Participants ranged in age from 17 to 67 years ($M = 35.92$, $SD = 14.1$). At the time of the experiment, 56.3% of the participants were partnered and 43.7% single. Of 281 participants, 51 ($F = 28$, $M = 23$) reported to have a recent breakup. Among women who had a recent breakup, 14 of them stated that their partner initiated the breakup, while 14 of them indicated that they initiated the breakup. As for men, 15 of them said that they initiated the breakup and 8 of them said their partner did. Ethical approval was obtained from the University of Stirling, General University Ethics Panel (GUEP).

4.2.2 Materials

Attachment security measure

Attachment security was measured by the same self-report scale the Experiences in Close Relationships - Relationship Structures (ECR-RS) which was used in Chapter 2 and 3 (Fraley, Heffernan, Vicary, & Brumbaugh, 2011). However, in the present study, the ECR-RS scale was used only for the romantic partner. Cronbach's alpha reliability estimates in this sample for "partner domain" were $\alpha_{\text{avoid}} = 0.85$, $\alpha_{\text{anx}} = 0.93$.

Relationship scenarios

To manipulate participants' partner attachment security, three relationship scenarios were created. These scenarios were either portraying; a relationship where participants were initiating a breakup with the partner (scenario 1), a happy relationship (scenario 2) or a relationship where participants were being rejected by the partner (scenario 3) (see table 4.1). Participants were randomly assigned to read one of these scenarios.

Table 4. 1 Relationship scenarios

Scenario 1 ~ Initiating breakup	One day you and your partner decide to go for a walk by the lake. You walk around the lake and decide to sit on the pier and talk. Your partner wants to talk about your future plans, about marriage and starting a family together. The conversation is going well at first, but as your partner is talking, you start to lose interest. In that specific moment, you realize that the spark is gone and you no longer feel any attraction. You can't imagine a future together. With this realization, you decide to talk about how you feel. One thing leads to another and you begin to argue. You both raise your voices and it turns into a huge fight. You know that the relationship will not work at this point, and you decide to break up with your partner... It is very unexpected and sudden, so your partner does not take it well. Your partner is heartbroken and begins to cry. You get up and walk away.
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Scenario 2 ~ Happy relationship

One day you and your partner decide to go for a walk by the lake. You walk around the lake and decide to sit on the pier and talk. You both want to talk about your future plans, about marriage and starting a family together. In that specific moment, you realize that the spark between you is as intense as it has ever been and how much you are attracted to each other. You can really imagine an amazing future together. You realize how much you love your partner and how excited you are about your wonderful future together. You continue to chat about your plans and it turns into a beautiful evening. You really know that this relationship is going to work. You cuddle for a while and watch the sunset together. The day has been as good as you could ever have expected, and you are so happy that you could almost cry. Eventually, just when it feels right, you get up and walk home together.

Scenario 3 ~ Being rejected

One day you and your partner decide to go for a walk by the lake. You walk around the lake and decide to sit on the pier and talk. You want to talk about your future plans, about marriage and starting a family together. The conversation is going well at first, but as you are talking, you can see your partner is starting to lose interest. In that specific moment, your partner realizes that the spark is gone, no longer feels any attraction for you, and can't imagine a future together. With this realization, your partner decides to talk about how it feels. One thing leads to another and you begin to argue. You both raise your voices and it turns into a huge fight. Your partner knows the relationship will not work at this point and breaks up with you... It is very unexpected and sudden, so you do not take it well. You are heartbroken and begin to cry. Your partner gets up and walks away.

4.2.3 Procedure

Data was collected through the Qualtrics link, distributed online. Informed consent was obtained from each participant prior to the study. Hereafter, the consenting participants responded to a series of questions to gather demographic information (e.g. age, sex, relationship status, a recent breakup experience, if had a recent breakup who initiated it etc). Upon demographic and relationship questions, participants were asked to complete the ECR-RS scale for a partner. Then, participants were randomly assigned to read one of the relationship scenarios. They were instructed to read the scenario and imagine themselves in that situation with their actual partner or someone they would like to be with. Among men ($N = 116$), 34 were assigned to read scenario 1, 42 to read scenario 2 and 40 to read scenario 3. As for women ($N = 165$), 52 were assigned to read scenario 1, 56 to read scenario 2 and 57 to read scenario 3. After reading the assigned scenario, participants were asked the same ECR-RS questions for the partner again.

4.2.4 Statistical analysis

Statistical analyses were carried out on SPSS version 25. The first 6 items of the ECR-RS scale measure the avoidance dimension, while the last 3 measure anxiety. The avoidance score was computed by averaging items 1 - 6, while reverse keying items 1, 2, 3, and 4. And the anxiety score was calculated by averaging items 7 - 9. These two scores were computed separately for the partner. The change in attachment anxiety and avoidance scores were calculated by subtracting pre-scenario scores from post-scenario scores. Positive scores indicate an increase in attachment avoidance and anxiety, while negative scores indicate a decrease. These difference scores were used as variables in the analyses below.

A two-way ANOVA was carried out separately for partner attachment anxiety and avoidance (DV), gender and condition (happy relationship, initiating breakup with a partner, and being rejected by a partner) being between-subject factors (IVs).

To explore the data further, two-way ANOVA analyses were conducted separately for partner anxiety and avoidance to analyse the effects of relationship status and recent breakup experience. For relationship status, the dependent variable was partner anxiety/avoidance and the independent variables were relationship status and condition. As for recent breakup experience, the dependent variable was partner anxiety/avoidance and the independent variables were recent breakup experience and condition.

4.3 Results

4.3.1 *The effects on partner attachment anxiety and avoidance*

First, I tested whether partner attachment anxiety and avoidance were influenced by exposure to relationship breakdown cues. A general linear model with condition and gender being between-subject factors was constructed. There was no statistically significant interaction between gender and condition on partner attachment anxiety scores $F(2, 275) = 2.025, p = .134$, partial $\eta^2 = .015$. Therefore, an analysis of the main effect for gender and condition was performed, which indicated no significant main effect of gender, $F(1, 275) = 1.173, p = .280$, partial $\eta^2 = .004$ or main effect of condition $F(2, 275) = 1.091, p = .337$, partial $\eta^2 = .008$.

The interaction effect between gender and condition on partner attachment avoidance was not statistically significant $F(2, 275) = 318, p = .728$, partial $\eta^2 = .002$. An analysis of the main effect for gender and condition was performed. However, there was no statistically significant main effect of gender, $F(1, 275) = .321, p = .572$, partial $\eta^2 = .001$ or condition $F(2, 275) = 2.208, p = .112$, partial $\eta^2 = .016$ on partner avoidance.

4.3.2 *Relationship status*

Next, the effects of relationship status (partnership) and condition on partner attachment security were examined. The interaction effect between partnership and condition on partner attachment avoidance was not statistically significant in women, $F(2, 159) = 1.616, p = .202$, partial $\eta^2 = .020$ or in men $F(2, 109) = 1.361, p = .261$, partial $\eta^2 = .024$. An analysis of the main effect for partnership was performed, which indicated that the main effect was statistically significant in women, $F(1, 159) = 6.583, p = .011$, partial $\eta^2 = .040$. However, the main effect for partnership was not significant in men $F(1, 109) = .109, p = .742$, partial $\eta^2 = .001$.

There was no significant interaction effect between partnership and condition on partner attachment anxiety both in men $F(2, 109) = 2.032, p = .136$, partial $\eta^2 = .036$ and in women $F(2, 159) = 2.208, p = .113$, partial $\eta^2 = .027$. An analysis of the main effect for partnership indicated a statistical significance in women $F(1, 159) = 9.952, p = .002$, partial $\eta^2 = .059$. However, there was no significant main effect of partnership in men $F(1, 109) = .774, p = .381$, partial $\eta^2 = .007$ on partner attachment anxiety.

4.3.3 The effects of a recent breakup experience on partner attachment anxiety

There was a statistically significant interaction between recent breakup and condition on partner attachment anxiety in women $F(2, 159) = 3.390, p = .036$, partial $\eta^2 = .041$.

Therefore, an analysis of simple main effects for condition and the recent breakup was performed with statistical significance receiving a Bonferroni adjustment and being accepted at the $p < .025$ level. There was a statistically significant difference in partner attachment anxiety scores between women who had a recent breakup and those who did not, who were in initiating breakup with a partner condition, $F(1, 159) = 12.469, p = .001$, partial $\eta^2 = .073$ (see Figure 4.1a). For initiating breakup with a partner condition, mean partner attachment anxiety for women who did not have a recent breakup was $-.061$ ($SD = 1.08$) and -1.58 ($SD = 1.75$) for women who had a recent breakup, a statistically significant mean difference of 1.52 points, 95% CI [.671, 2.374], $F(1, 159) = 12.469, p = .001$, partial $\eta^2 = .073$. A simple main effect for condition indicated a statistically significant difference in mean partner attachment anxiety scores between women who had a recent breakup, who were either in a happy relationship, initiating breakup with a partner or being rejected by a partner condition $F(2, 159) = 3.959, p = .021$, partial $\eta^2 = .047$. Women who had a recent breakup and were in being rejected by a partner condition, mean partner attachment anxiety was $-.133$ ($SD = .28$) and -1.58 ($SD = 1.75$) for women who had a recent breakup but was in initiating breakup with a partner condition, a statistically significant mean difference of 1.45, 95% CI [.162, 2.738], $F(2, 159) = 3.959, p = .021$, partial $\eta^2 = .047$.

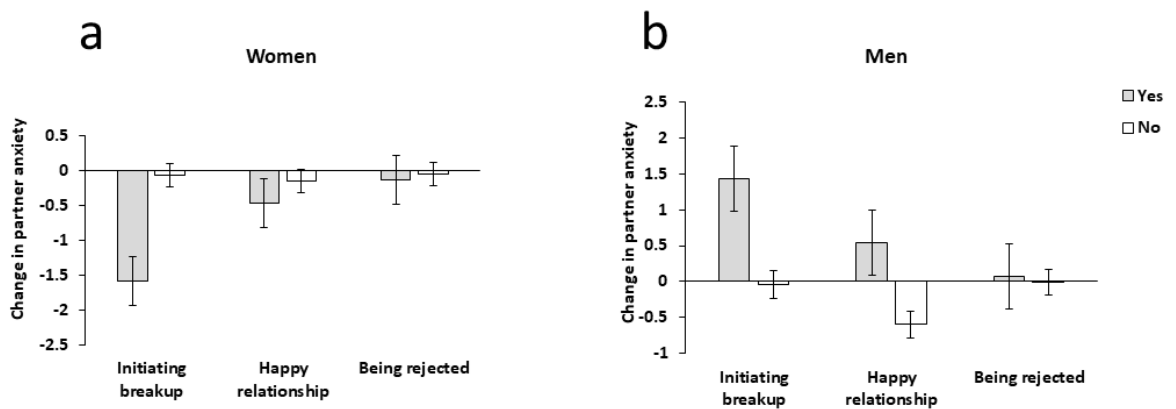


Figure 4. 1 Mean ($\pm$ s.e.) change in partner attachment anxiety scores of women (a) and men (b) who had a recent breakup

As for men, there was no statistically significant interaction between recent breakup and condition on partner attachment anxiety $F(2, 109) = 2.478, p = .089$, partial $\eta^2 = .041$. However, the main effect of recent breakup was significant $F(1, 109) = 13.161, p < .001$, partial $\eta^2 = .043$. There was a significant difference in mean partner attachment anxiety scores between those who had a recent breakup and those who did not. The marginal mean change for partner attachment anxiety was .68 ($SE = 0.224$) for men who had a recent breakup and -.22 ($SE = .107$) for men who did not have a recent breakup, a statistically significant mean difference of .901, 95% CI [.409, 1.393], $p < .001$. There was also a statistically significant main effect of condition, $F(2, 109) = 3.616, p = .036$, partial $\eta^2 = .062$. There was a significant difference in mean partner attachment anxiety scores between those who were in initiating breakup with a partner and those who were in happy relationship condition. The marginal mean change for partner attachment anxiety scores was .69 ($SE = .216$) for initiating break up with a partner condition and -.28 ($SE = .179$) for happy relationship condition, a statistically significant mean difference of .718, 95% CI [.035, 1.401], $p = 0.36$.

However, no significant interaction effect of breakup initiation and condition on partner attachment anxiety was found either in men $F(2,17)= 1.781, p = .198$, partial $\eta^2 = .173$ or in women $F(2,22)= .007, p = .993$, partial $\eta^2 = .001$.

4.3.4 The effects of a recent breakup experience on partner attachment avoidance

The interaction effect between recent breakup and condition on partner attachment avoidance was not statistically significant in women, $F(2, 159) = .286, p = .752$, partial $\eta^2 = .004$. There were also no statistically significant main effect of recent breakup $F(1,159) = 2.702, p = .102$, partial $\eta^2 = .017$ and condition $F(2,159) = .370, p = .691$, partial $\eta^2 = .005$ in women.

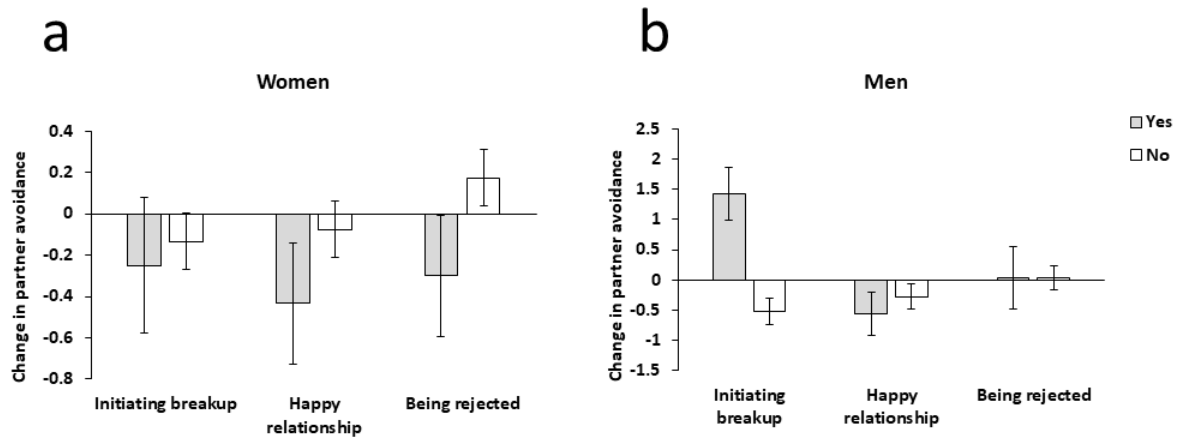


Figure 4. 2 Mean ($\pm$ s.e.) change in partner attachment avoidance scores of women (a) and men (b) who had a recent breakup

As for men, there was a statistically significant interaction between recent breakup and condition on partner attachment avoidance, $F(2, 109) = 6.471, p = .002$, partial $\eta^2 = .106$. A simple main effect of recent breakup indicated a statistically significant difference in mean partner attachment avoidance scores between men who had a recent breakup and men who did not, who were in initiating breakup with a partner condition, $F(1, 109) = 15.420, p < .001$, partial $\eta^2 = .124$ (see Figure 4.2b). For initiating breakup with a partner condition, mean partner attachment avoidance change for men who had a recent breakup was 1.43 ($SD = 2.26$) and -.52 ($SD = 1.72$) for men who had not, a statistically significant mean difference of 1.951, 95% CI [.966, 2.935], $F(1, 109) = 15.420, p < .001$, partial $\eta^2 = .124$. A simple main effect of condition revealed a statistically significant difference in mean partner attachment avoidance scores between men who had a recent breakup, who were either in happy relationship, initiating breakup with a partner or being rejected by a partner condition $F(2, 109) = 6.215, p = .003$, partial $\eta^2 = .102$. The mean partner attachment avoidance was 1.43 ($SD = 2.26$) for men who reported a recent breakup, who were in initiating breakup with a partner condition and -.56 ($SD = .74$) for men who had a recent breakup, who were in happy relationship condition, a statistically significant mean difference of 1.989 points, 95% CI [.612, 3.366], $p = .002$.

Contrary to expectation, initiating breakup with a partner did not influence partner attachment avoidance. There was no statistically significant interaction between breakup initiation and condition on partner attachment avoidance in men $F(2,17) = .861, p = .44$, partial $\eta^2 = .092$ and also in women $F(2,22) = 1.062, p = .363$, partial $\eta^2 = .088$.

4.4 Discussion

The aim of this study was to examine whether exposure to relationship breakdown cues alters partner attachment security. Relationship dissolution considered to be a traumatic, stressful life experience (Tashiro et al., 2006). In a sense, a relationship dissolution equals to loss of an attachment figure. Therefore, the prediction was that exposure to relationship breakdown cues, such as being rejected by a partner or initiating a breakup with a partner would influence individuals' partner attachment security.

The results of exploratory analyses revealed that recent breakup experience was a strong predictor of change in attachment security. I found that women who had a recent breakup significantly decreased their partner attachment anxiety scores after reading the scenario about initiating breakup with a partner, compared to women who did not have a breakup. On the other hand, men who had a recent breakup significantly became more avoidant towards a partner after reading the scenario about initiating breakup with a partner compared to men who did not have a recent breakup. The same scenario affected different dimensions of attachment security in women and men. While a recent breakup experience decreased women's partner attachment anxiety, it increased men's partner attachment avoidance.

Attachment anxiety refers to the degree to which a person worries about being rejected, fears abandonment and doubts his/her worth in relationships, while attachment avoidance refers to the extent to which a person dislikes depending on others and having others depends on him/her, avoids intimacy and devalues the importance of relationships (Shaver & Mikulincer, 2002). A meta-analysis on sex differences in attachment avoidance and anxiety dimensions concluded that men are generally more avoidantly attached in relationships compared to women (Del Giudice, 2011). This supports the finding of increased partner attachment avoidance in men who had a recent breakup and were exposed to a scenario about initiating breakup with a partner. The scenario about breakup initiation might have triggered men more than women, who are assumed to be more avoidant in relationships.

There was no direct effect of relationship breakdown cues on partner attachment anxiety and avoidance. However, there was a change in attachment security among participants who had reported a recent relationship dissolution. Out of 165 women, 28 reported a recent breakup experience and 23 of 116 men indicated a recent breakup. Relationship dissolution can be one of the most distressing life events. Termination of a romantic relationship considered to be eminently emotional, stressful and even a painful

experience for some people (Sprecher, Felmlee, Metts, Fehr, & Vanni, 1998). Experiencing such a traumatic event, and reading a relationship dissolution scenario, might have caused participants to internalize the situation and altered their partner attachment security compared to participants who did not have a recent relationship dissolution. The findings of this study are consistent with that of Ruvolo et al. (2001) who found a change in attachment security following a dissolution of a romantic relationship.

A study by Feeney and Noller (1992) assessed participants' attachment style and the report of relationship dissolution twice (10 weeks apart). They found that avoidantly attached participants were most likely to experience breakup. The current study generated a similar finding as men who had a recent breakup, who were in initiating breakup condition significantly increased their partner avoidance scores. Therefore, it is safe to assume a relationship between attachment avoidance and breakup experience. However, even though experiencing a recent breakup affected the partner attachment security, the perception of who initiated the breakup did not have a significant effect on partner attachment security, both in men and women.

Relationship dissolution is the loss of a partner. According to Weiss (1976) following a marital divorce, adults show symptoms of separation distress similar to symptoms young children exhibit when they lose an attachment figure. Therefore, this might explain the reason why a change in attachment security has occurred in participants with recent relationship dissolution, compared to ones who did not have a recent breakup.

As with most studies, the design of the current study is subject to limitations. This study only asked whether participants had a recent breakup and who initiated the breakup. However, it did not ask the exclusivity/commitment level of the relationship and how long the relationship has lasted. Future studies should consider about asking these questions, as previous research found relationship duration to be effective on couples' attachment security (Duemmler & Kobak, 2001). In the current study, change in participants' partner attachment anxiety and avoidance were assessed after a manipulative condition. However, future studies can categorise participants as anxious, avoidant and secure according to their attachment and assess change in attachment styles rather than attachment security after manipulation of relationship breakdown cues. The current study tested stability and change of attachment security in the short-term. Therefore, future studies should consider a way to test the stability of attachment in the long-term. For instance, whether a bad relationship experience influences subsequent romantic relationships and partner attachment security in the long-term could be tested. Furthermore, also relationship variables might be related to

changes in the self-esteem, self-concept, and personality of individuals. This could be interesting to pursue further.

In conclusion, the present study examined whether exposure to relationship breakdown cues predicts change in individuals' attachment security. A recent relationship dissolution and exposure to relationship breakdown cues were a strong predictor of change in attachment security. The results of this study extend previous research on the stability of attachment by exploring predictors of change.

Section 2

Chapter 5: Congruency in hormonal contraception use and its influences on partner attachment security and relationship satisfaction

5.1 Introduction

It is believed that variation in hormonal levels affects psychological processes that influence the development and maintenance of human romantic relationships. For instance, women's judgment of the opposite sex's attractiveness is susceptible to hormonal fluctuations across the menstrual cycle (Gangestad & Thornhill, 2008; Jones et al., 2008; Roberts & Little, 2008). In some studies, women have been found to favour masculine faces (Penton-Voak et al., 1999) and bodies (Little, Jones, & Burriss, 2007) when fertile compared to non-fertile. Therefore, the use of exogenous hormones, like those found in combined oral contraceptives (OCs), could alter the mate preferences of women as they interrupt the normal levels of sex-steroid and other hormones, as well as cyclical variation (Alvergne & Lummaa, 2010; Jones et al., 2005; Puts, 2006; Roberts, Gosling, Carter, & Petrie, 2008; Wedekind, Seebeck, Bettens, & Paepke, 1995).

Previous studies found initiation of OC use to change women's preference for genetically dissimilar partners (Roberts et al., 2008) and facial masculinity (Little, Burriss, Petrie, Jones, & Roberts, 2013). Women shifted their preference towards the odour of men who were MHC-similar following initiation of OC use which suggests that OC use might interfere with adaptive mate choice (Roberts et al., 2008), while Little et al. (2013) found it significantly decrease women's preference for male facial masculinity in their experimental study. Furthermore, to test whether it influences actual partner choice, they investigated facial characteristics of male partners of women who were OC users or non-users during relationship formation. They found that partners of women who were OC users during mate choice have less masculine faces compared to partners of non-OC users during relationship formation.

Therefore, the use of OCs may affect both women's initial partner choice (depending on the use of OC during relationship formation) and their satisfaction with that choice. Roberts et al. (2012) demonstrated that OC use versus non-use during relationship formation plays a role in subsequent relationship satisfaction. In their study, women who met their partner while they were on OC reported higher emotional satisfaction in their relationship but lower sexual satisfaction than women who were not using OC when they met their partner. This research was the first to demonstrate that these subtle shifts have implications for the quality of romantic relationships. Hence, associations between hormonal contraception (HC) use and relationship satisfaction may be best understood by considering whether current use is congruent with the use during relationship formation, rather than considering the current use alone.

According to the congruency hypothesis, congruency between current OC use and previous use during relationship formation should more accurately predict women's sexual desire and satisfaction with the partner rather than the current use alone. The reason is that, if a woman's OC use is congruent (current OC user who was also OC user during the relationship formation, or current non-user who was also non-user during the relationship formation) her current preference would more accurately match with the preference she had during the initial partner choice (Roberts, Cobey, Klapilová, & Havlíček, 2013).

Roberts et al. (2014) conducted a study to test the congruency hypothesis in couples. Both partners in each couple assessed their relationship satisfaction separately, and the women provided information about their current and previous OC use. They found congruency in current and previous contraceptive use, but not the current use alone to predict women's sexual satisfaction with their partners. However, congruency was not associated with women's nonsexual satisfaction or with the satisfaction of their male partners. They found that women whose OC use was congruent reported higher sexual satisfaction with their partner than women whose OC use was noncongruent.

Based on previous findings, this study will investigate whether congruency in OC use also influences attachment security in romantic relationships alongside sexual satisfaction. In the current study, I sought to expand on previous research which has examined the effects of congruent OC use on partner preferences and relationship satisfaction, and investigated whether there are any consequences of congruent OC use on romantic attachment security. Higher attachment avoidance is associated with lower relationship satisfaction (Vollmann, Sprang, & van den Brink, 2019) and as previously it has been found that non-congruency in previous and current OC use causes lower sexual satisfaction with the partners, I predict noncongruent OC users to be more insecurely attached, precisely more avoidant, compared to congruent OC users. A recent study found non-congruent OC users (OC user at the time of relationship formation but not current user) who are in high fertility phase to be more inclined to look for alternative mates (Birnbaum, Zholtack, Mizrahi, & Ein-Dor, 2019). Therefore, discontinuation of OC use might lead women, at least the ones who were OC users during relationship formation, to get involved in extradyadic affairs. Accordingly, it is expected for noncongruent women, especially those who were OCs users at the time of relationship formation, to have higher partner attachment avoidance or lower partner attachment anxiety compared to congruent women.

5.2 Methods

5.2.1 Participants

In total, 227 partnered women with no current pregnancy participated in this study. The average age of the participants was 27.50 ($SD = 9.6$). The majority of the sample was drawn from the United Kingdom ($N = 92$) and Czech Republic ($N = 91$); other participants were from the Turkish Republic of Northern Cyprus ($N = 21$), Turkey ($N = 14$) and other countries ($N = 9$). Participants were recruited online through the researcher's social media accounts and the University of Stirling's participant pool. The survey was designed and completed on Qualtrics.

5.2.2 Materials

Relationship satisfaction

Relationship satisfaction was separated assessed as sexual satisfaction and nonsexual satisfaction. Based on a previous study by Garver-Apgar et al. (2006) two items that targeted sexual satisfaction (“How satisfied are you with your partner’s sexual adventurousness?” and “How satisfied are you with your partner’s ability to arouse you sexually?”) and two items that targeted nonsexual satisfaction (“How satisfied are you with your partner’s financial provision/intelligence?”) were asked. Scores were given on a 9-point rating scale (1 = ‘does not satisfy me at all’, 9 = ‘completely satisfied’). In both cases, responses to the two items were averaged to create a composite score for sexual satisfaction and nonsexual satisfaction. Cronbach’s alpha reliability estimates in this sample were $\alpha = 0.70$ for nonsexual satisfaction and $\alpha = 0.91$ for sexual satisfaction.

Partner attachment security

In order to assess women’s partner attachment security, the Experiences in Close Relationships-Relationship Structures (ECR-RS) scale was used (Fraley, Heffernan, Vicary, & Brumbaugh, 2011). In this study, the scale was only administered for the current romantic partner (see chapter 2.2.3 for more information). Cronbach’s alpha reliability estimates in this sample for “partner domain” were $\alpha_{\text{avoid}} = 0.82$, $\alpha_{\text{anx}} = 0.79$.

5.2.3 Procedure

Participants were invited to take part in an online study on Qualtrics about relationship experiences. Upon informed consent, participants were directed to the questionnaire. After the demographic questions (age, nationality etc.), participants were asked to complete the ECR-RS scale for their current partner. Then, participants were asked questions about their

relationships. Relationship questions contained items about both previous and current contraceptive use (e.g., “When you began your relationship with your current partner which forms of contraceptive methods did you use?”, “Which forms of contraceptive do you currently use?”) and current pregnancy. Finally, participants were asked to rate their sexual and non-sexual satisfaction with their partner.

5.2.4 Statistical analysis

Women’s responses about their previous (the contraceptive use when they met their partner) and current contraceptive use were coded into three categories: (i) nonusers of hormonal methods (women using no contraception, using condoms or other barrier methods), (ii) users of combined OCs, and (iii) users of other hormonal methods (women using progestogen-only pills; hormonal intrauterine devices; implants; or injections). See Table 5.1 below for sample sizes in each category.

Table 5. 1 Number of sampled women according to their contraceptive method when they met with their partner and their current method

Contraceptive method women were using when they met their partner	Current contraceptive method			Total
	No hormonal contraceptive	Combined oral contraceptive	Other hormonal contraceptive	
No hormonal contraceptive	93	23	11	127
Combined oral contraceptive	33	42	9	84
Other hormonal contraceptive	2	1	13	16
Total	128	66	33	227

Note: Numbers in bold indicate women whose previous and current contraceptive use were congruent ($n = 148$; noncongruent use: $n = 79$).

Partner attachment avoidance was computed by averaging items 1-6, while reverse keying the first 4 items and partner attachment anxiety was computed by averaging items 7-9. Sexual satisfaction was calculated by averaging items: “How satisfied are you with your partner’s sexual adventurousness?” and “How satisfied are you with your partner’s

ability to arouse you sexually?”, and nonsexual satisfaction was calculated by averaging items “How satisfied are you with your partner’s financial provision/intelligence?”.

The congruency hypothesis was tested in two ways; first I tested whether relationship satisfaction and partner attachment security were influenced by congruency in use or nonuse of hormonal contraception- that is, whether a woman’s current contraceptive method (as shown in Table 5.1) matched ($n = 148$) or did not match ($n = 79$) her previously used method. One generalised linear model was constructed for two measures of relationship satisfaction (sexual and nonsexual), with congruency as the between-subjects factor. A second generalised linear model was constructed for two measures of partner attachment (anxiety and avoidance) with congruency as the between-subjects factor.

Next, I explored different routes to congruency, following Roberts et al. (2014). Two generalised linear models were created (one with two measurements of relationship satisfaction and one with two measurements of partner attachment) with two between-subjects factors (previous OC use, current OC use). In these analyses, non-OC hormonal contraception users were excluded, because very few women used such methods that it was not possible to investigate directional changes in their use. This left 135 women whose previous use and current use was congruent, and 56 whose previous use and current use were noncongruent (Table 5.1).

5.3 Results

5.3.1 Contraceptive congruency

Effects of contraceptive congruency on relationship satisfaction

There was no significant effect of congruency on women’s sexual satisfaction, $F(1,225) = .43$, $p = .513$, partial $\eta^2 = .002$ and nonsexual satisfaction $F(1,225) = .029$, $p = .864$, partial $\eta^2 < .001$.

Controlling for potential influences on relationship satisfaction, the models were run again for sexual and nonsexual satisfaction including covariates (relationship duration, relationship happiness). Again, no significant main effect of congruency for women’s sexual satisfaction scores was found $F(1,223) = .707$, $p = .401$, partial $\eta^2 = .003$. Similarly, there was no significant main effect of congruency on women’s nonsexual satisfaction $F(1, 223) = .428$, $p = .514$, partial $\eta^2 = .002$.

Effects of contraceptive congruency on partner attachment anxiety and avoidance

There was a significant effect of congruency on women's partner attachment anxiety $F(1,225) = 5.715, p = .018$, partial $\eta^2 = .025$. Women in the congruent group had statistically significantly higher partner attachment anxiety scores than women in the noncongruent group (see Figure 5.1b). On the other hand, there was no significant main effect of congruency on women's partner attachment avoidance $F(1,225) = 3.672, p = .057$, partial $\eta^2 = .016$.

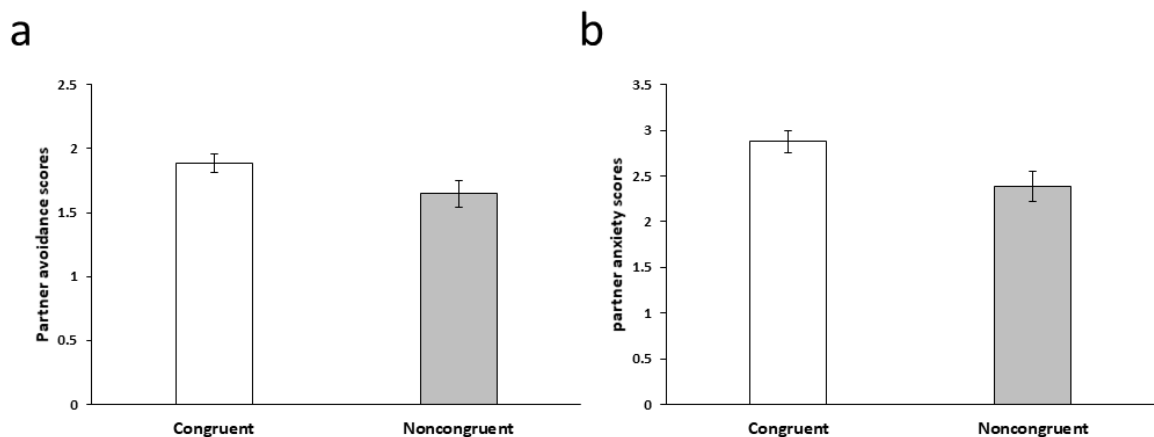


Figure 5. 1 Mean ($\pm$ s.e.) partner attachment avoidance (a) and partner attachment anxiety scores (b) as a function of congruency in use or nonuse of hormonal contraception.

In order to examine these effects further, controlling for other potential influences on partner attachment, the same models were run again for partner attachment anxiety and avoidance including covariates (relationship duration, relationship happiness). Again, a significant main effect of congruency was found for women's partner attachment anxiety scores, $F(1, 223) = 4.187, p = .042$, partial $\eta^2 = .018$; women whose previous and current contraceptive use was congruent reported higher partner attachment anxiety scores compared to noncongruent. On the other hand, again there was no significant main effect of congruency on women's partner attachment avoidance, $F(1, 223) = 3.3, p = .071$, partial $\eta^2 = .015$.

5.3.2 Routes to congruency and noncongruency

Effects of previous and current OC use on relationship satisfaction

There was a statistically significant main effect of previous OC use, $F(1,187) = 4.48, p = .036$, partial $\eta^2 = .023$ and a main effect of current OC use, $F(1,187) = 13.7, p < .001$, partial $\eta^2 = .068$ on women's sexual satisfaction. Previous non-OC users had statistically

higher sexual satisfaction scores ($M = 7.48$, $SE = .23$) than previous OC users ($M = 6.80$, $SE = .23$), while current OC users had significantly higher sexual satisfaction scores ($M = 7.73$, $SE = .25$) than current non-OC users ($M = 6.55$, $SE = .20$). However, there was no significant interaction between previous and current OC use on women's sexual satisfaction with their partners, $F(1,187) = .939$, $p = .334$, partial $\eta^2 = .005$.

For non-sexual satisfaction, on the other hand, no significant main effects of previous OC use $F(1,187) = 2.908$, $p = .09$, partial $\eta^2 = .015$, or of current OC use $F(1, 187) = 3.568$, $p = .06$, partial $\eta^2 = .019$ were found, nor was there a significant interaction effect $F(1,187) = 1.036$, $p = .31$, partial $\eta^2 = .006$.

The same models were rerun for sexual and nonsexual satisfaction, now including covariates (relationship duration, relationship happiness) to control for other potential influences on satisfaction. This time, no significant main effect of previous OC use, $F(1,185) = 1.275$, $p = .26$, partial $\eta^2 = .007$ was found on women's sexual satisfaction. The main effect of current OC use on women's sexual satisfaction remained significant $F(1, 185) = 5.096$, $p = .025$, partial $\eta^2 = .027$. Relationship happiness had a statistically significant impact on women's sexual satisfaction $F(1, 185) = 30.385$, $p < .001$, partial $\eta^2 = .141$. There was no significant interaction effect of previous and current OC use on women's sexual satisfaction, $F(1,185) = 1.606$, $p = .207$, partial $\eta^2 = .009$. As for nonsexual satisfaction, again, there was no significant main effect of previous OC use $F(1, 185) = .793$, $p = .374$, partial $\eta^2 = .004$ or of current OC use $F(1, 185) = .872$, $p = .352$, partial $\eta^2 = .005$. Again, the interaction effect between previous and current OC use on women's nonsexual satisfaction was not significant $F(1, 185) = .297$, $p = .586$, partial $\eta^2 = .002$.

Effects of previous and current OC use on partner attachment anxiety and avoidance

There was no significant main effect of previous OC use, $F(1,187) = .364$, $p = .547$, partial $\eta^2 = .002$, or of current OC use, $F(1,187) = .185$, $p = .668$, partial $\eta^2 = .001$, on women's partner attachment anxiety. However, as predicted by the congruency hypothesis, the interaction between previous and current OC use had a significant effect on women's partner attachment anxiety, $F(1,187) = 6.018$, $p = .015$, partial $\eta^2 = .031$. Women whose OC use was congruent reported higher attachment anxiety with their partners than women whose OC use was noncongruent. Figure 5.2b demonstrates this interaction and shows that even though congruency via either route was associated with higher partner attachment

anxiety scores, the difference was greater among women who were OC users when they met their partners than among those who were not OC users.

This pattern was also confirmed by post hoc independent-samples *t*-tests. The congruency effect was significant in women who had met their partners while using OCs, $t(82) = 2.307, p = .024$, women who met their partners while using OCs and who were current OC users reported significantly higher partner attachment anxiety scores than women who had discontinued their OC use. On the contrary, among women who were not using OCs when they met their partners, there was no significant difference in partner attachment anxiety scores between those who were still nonusers of OCs and those who had started using OCs, $t(125) = .751, p = .454$.

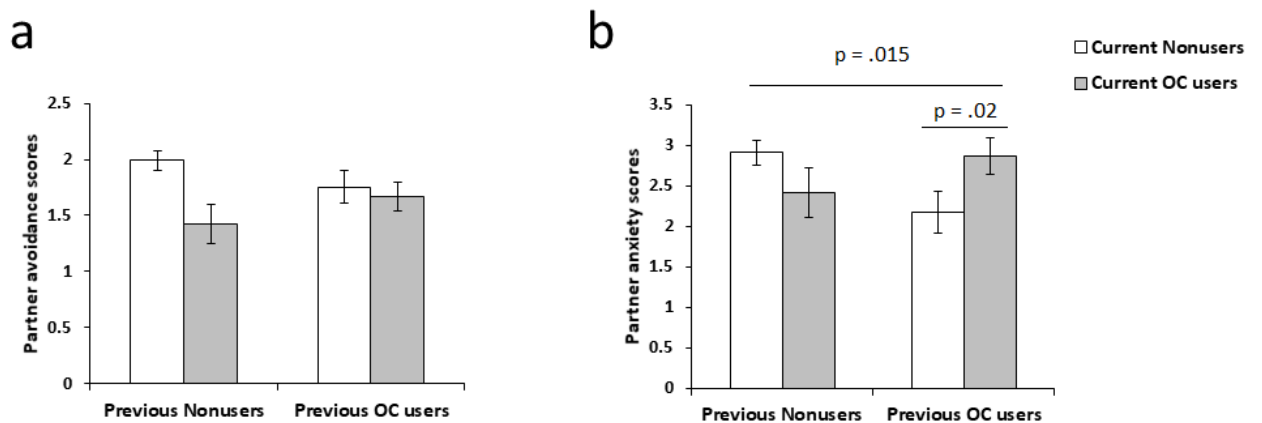


Figure 5. 2 Partner attachment avoidance (a) and attachment anxiety (b) scores as a function of women's previous and current use or nonuse of combined oral contraceptives (OCs). The graphs present estimated marginal means ($\pm$ s.e.).

As for partner attachment avoidance, there was no significant main effect of previous OC use $F(1, 187) = .001, p = .97$, partial $\eta^2 < .001$, on partner attachment avoidance. However, there was a significant main effect of current OC use, $F(1, 187) = 5.684, p = .018$, partial $\eta^2 = .029$ on partner attachment avoidance. Current non-OC users had significantly higher partner attachment avoidance scores ($M = 1.87, SE = .08$) than current OC users ($M = 1.55, SE = .11$). There was no significant interaction effect between previous and current OC use on women's partner attachment avoidance, $F(1,187) = 3.194, p = .076$, partial $\eta^2 = .017$.

Controlling for other potential influencers on partner attachment, same models were run again with multiple covariates (relationship duration, relationship happiness). There was no significant main effect of previous $F(1,185) = 1.285, p = .258$, partial $\eta^2 = .007$, or of current OC use $F(1,185) = .634, p = .427$, partial $\eta^2 = .003$ on partner attachment anxiety. Again, there was a significant interaction effect between previous and current OC use on women's partner attachment anxiety $F(1,185) = 4.017, p = .046$, partial $\eta^2 = .021$. As for partner attachment avoidance, there was no significant main effect of previous OC use $F(1, 185) = 2.817, p = .095$, partial $\eta^2 = .015$. However, this time the main effect of current OC use on women's partner attachment avoidance was not significant $F(1,185) = .821, p = .366$, partial $\eta^2 = .004$. Again, there was no significant interaction effect between previous and current OC use on partner attachment avoidance $F(1,185) = 1.844, p = .176$, partial $\eta^2 = .010$.

5.4 Discussion

The aim of this study was to test whether congruency in contraception use influences relationship satisfaction and partner attachment security in partnered women. This study was the first to investigate a change in partner attachment security concerning current OC use, OC use at the time of relationship formation, and congruency in OC use between these times.

5.4.1 Relationship satisfaction

Previously, it was found that congruency in previous and current OC use predicts women's sexual satisfaction. Roberts et al. (2014) found women who were OC users at the time of relationship formation and who were still OC users (congruent) to report higher sexual satisfaction with their partners compared to women who had changed their OC use. The current study also tested whether congruency in previous and current OC use influences partner relationship satisfaction. Congruency in previous and current OC use did not significantly predict women's sexual satisfaction. However, the results of this study found non-OC users at the time of relationship formation to report higher sexual satisfaction than women who were OC users at that time. These findings were consistent with the results of a previous study by Roberts et al. (2012) which found women who were OC users when they met their partner to report significantly lower sexual satisfaction scores than women who were non-OC users.

5.4.2 Partner attachment security

The congruency hypothesis suggests that being congruent in hormonal contraception use leads to happier relationships. Contrary to expectations, in this study, congruency via either route was associated with high partner attachment anxiety. Women whose hormonal contraception method was congruent reported higher partner attachment anxiety than women whose hormonal contraception method was noncongruent. The results also indicated congruency in OC use to affect women's attachment anxiety (not attachment avoidance) with their partners. Especially, women who were OC users when they started their relationships and who were still OC users reported higher partner attachment anxiety than women who had discontinued their OC use. A previous study found that women using hormone-based birth control tend to have more sexual jealousy compared to other women (Geary, DeSoto, Hoard, Sheldon, & Cooper, 2001). Partner attachment anxiety is associated with jealousy, as anxiously attached individuals experience a higher level of behavioural and cognitive jealousy (Rodriguez, DiBello, Øverup, & Neighbors, 2015). Therefore, this could explain the high partner attachment anxiety in women who were previous (at the beginning of the relationship) and current OC users.

Even though congruency via either route predicted higher partner attachment anxiety, lower partner attachment anxiety associated with noncongruency was particularly evident in women who met their partners while using OCs. The results showed that women who began their relationships while using OCs and subsequently discontinued their OC use reported lower partner attachment anxiety than women who had used OCs throughout their relationships (congruent). This means that women who had discontinued their OC use (not current OC user) after the relationship formation were less worried about their partners leaving them, or if their partners do not care about them as much as they do.

Previous studies revealed that change in OC use alters women's partner preferences (Roberts et al., 2008) and their preference for facial masculinity in men (Little et al., 2013). Therefore, these changes might be responsible for the lower partner anxiety scores, as discontinuation in OC use causes a realignment of women's partner preferences to a different baseline state. They might not find their partners as attractive as once they did when they first met due to the change in OC use. Hence, they can be less worried about their partners leaving them. Furthermore, noncongruent OC user women (OC users at the time of relationship formation but not current users) in the high fertility phase reported desire for alternative attractive mates compared to women who either had not used pills at relationship formation or had used pills at relationship formation but did not stop using

them (Birnbaum et al., 2019). This can also explain the lower partner attachment anxiety compared to previous and current OC users (congruent) as they might be already desiring an alternative partner. To test it further, future research can ask congruent and noncongruent OC users to rate their current partners' attractiveness along with other attractive male faces, while assessing their partner attachment anxiety and avoidance.

5.4.3 Conclusion

In conclusion, the current study supports evidence that congruency or noncongruency in hormonal contraceptive use influences relationship dynamics and attachment security in romantic relationships. Hopefully, the findings of this study would stimulate interest in further testing of congruency hypothesis and lead to a deeper understanding of the impact of hormonal contraception use on women's close relationships and mating psychology.

Chapter 6: The origin of influences on general attachment security in relationships: A cross-cultural study

6.1 Introduction

According to attachment theory, attachment styles stem from social interactions throughout the life span. Bowlby (1969) believed attachment to characterise human experience from cradle to grave. Based on early interactions with caregivers, individuals form internal working models (i.e. expectations, beliefs for behaving and thinking). According to Bowlby, these mental representations or working models are a function of early caregiving experiences and can be transferred to adult relationships. For example, children who are securely attached to their parents will grow up to be secure in their romantic relationships (Bowlby, 1973). Working models established in childhood with parents are believed to form the foundation of attachment representations throughout the life span (Mikulincer & Shaver, 2003, 2007).

6.1.1 Influence of parents on attachment

Many researchers investigated the influence of parents on attachment among young children and found evidence that parents are theoretically responsible for the initial forming of attachment representations (Ainsworth, Blehar, Waters, & Wall, 1978; Thompson, 1999; Weinfield, Sroufe, Egeland, & Carlson, 1999). Fraley (2002) found support for a "prototype" model of attachment in his meta-analysis, which indicated that attachment patterns in early childhood were influenced by the family of origin and that these patterns continued to have a major impact over the years. Consistent with this model, a recent study found individuals' attachment style in infancy to predict the emotional quality of romantic relationships in early adulthood. However, they found this to be mediated by social competency in elementary school and attachment security in adolescent friendships (Simpson, Collins, Tran, & Haydon, 2007). This suggests that there is no direct influence of parent-child attachment on subsequent romantic relationships and it depends on other personal relationships outside the nuclear family.

Even though there is ample evidence that parents play a key role in shaping children's attachment styles, particularly concerning parents, very few researchers have focused on the influence of parents on romantic relationships. Some researchers focused on behavioural consistencies between parent and child and later romantic relationships. A longitudinal study found behavioural interactions with parents in adolescence to predict important characteristics of interactions with romantic partners in early adulthood (Conger, Cui, Bryant, & Elder Jr, 2000). Another study found poor marital adjustment to be associated with poor interactions with parents (Truant, Herscovitch, & Lohrenz, 1987).

6.1.2 Influence of partners on attachment

On the other hand, romantic attachment styles have also been found to be influenced by romantic relationships. Fraley and Davis (1997) suggested that, in late adolescence or early adulthood, the primary attachment status transfers from parents to peers. Therefore, as peers and ultimately romantic partners become the primary attachment figures, relationships with these individuals must influence attachment, just like relationships with parents did once. Mikulincer and Shaver (2003) stated that subsequent relationships might change attachment style and move it away from its initial form. A previous study provided evidence for this transfer. They found greater romantic engagement to be associated with a stronger attachment to partners and a weaker attachment to mothers among young adults (Feeney, 2004).

Nonetheless, the direct influence of partners on attachment styles has been explored only by a few researchers. Kirkpatrick and Hazan (1994) found romantic attachment to be moderated by breakup or initiation of new relationships. They found that across 4 years, individuals who started a new relationship became more secure while people who ended romantic relationships became less secure. A similar short longitudinal study by Ruvolo et al. (2001) found women to become less secure after a breakup and more secure after remaining together with their partner. These findings show that romantic partners and relationship experiences influence the attachment security of individuals.

6.1.3 Cultural differences

Previous research found differences in terms of attachment styles across cultures. Cultures are usually divided into two categories: individualist and collectivist. Individualism indicates the extent to which people value independence against group membership. While countries high on individualism dimension emphasise autonomy, countries high on collectivism dimension emphasise values that centre around families such as commitment to a group (Načinović Braje, Klindžić, & Galetić, 2019).

In general, individualism leads parents to encourage independence in their children, while collectivism manifests itself in parenting techniques that are aimed at creating interdependence (Greenfield, Maynard, & Suzuki, 2000). Many researchers used Mary Ainsworth's Strange Situation procedure to investigate differences in attachment patterns in individualist and collectivist cultures. For example, a study from an individualist culture (Northern Germany) that replicated Ainsworth's strange situation with mother and infant pairings found a high number of avoidantly attached infants (52%) (Grossmann,

Grossmann, Spangler, Suess, & Unzner, 1985). On the other hand, another study with Japanese (collectivist culture) mother and infant pairs found no significant difference in terms of proportions of secure (68%) and insecure (32%) infants. However, the Japanese insecure group comprised only anxious-resistant, and no avoidantly attached infants (Takahashi, 1986). A similar study with the Israeli (collectivist) sample also showed a high frequency of ambivalent pattern (Sagi et al., 1985). The findings from German data interpreted as parents showing high parental push towards children's autonomy, while children from Israeli and Japanese data were underexposed to strangers. The Japanese child-rearing method was considered as stressing close mother-infant bonds, which eventually caused to an excessive separation stress during the strange situation procedure (Grossmann et al., 1985).

The findings from individualist (Germany) and collectivist (Japan, Israel) cultures showed variation in terms of attachment. While infants in collectivist cultures tend to have an anxious-ambivalent attachment style, infants from individualist cultures tend to have an avoidant attachment style. The current study investigates and compares the predictor of general partner attachment security across four countries with widely varying geographic and cultural backgrounds. These countries are the United Kingdom, Czech Republic, Turkey and the Turkish Republic of Northern Cyprus. These countries have been grouped according to the individualist or collectivist nature of their cultures. This concept was one of several posited by Hofstede (1980) to characterise cultures. The United Kingdom and Czech Republic were grouped as individualist countries, and Turkey and the Turkish Republic of Northern Cyprus were grouped as collectivist countries.

As parents in individualist cultures foster independence of the children in their child-rearing, it is expected for the parental attachment to be less influential on individuals' attachment. Therefore, partners are expected to be a better predictor of general partner attachment security in the UK and Czech Republic (individualist cultures). On the other hand, collectivist cultures such as Turkish and Turkish Cypriot are very family-oriented and believed to have strong family ties (Sen, Yavuz-Muren, & Yagmurlu, 2014). Hence, parents might have more influence on the general partner attachment security in these countries. Therefore, it is predicted that parents would be the better predictor of the general partner attachment security.

Furthermore, previous research on the association between child-parent relationship and later romantic relationships relied on the Adult Attachment Interview (AAI) which focuses on a discussion of childhood interactions with parents (George, Kaplan, & Main,

1996; Hesse, 1999). However, the present study will use a self-report questionnaire that assesses attachment security towards parents and partners.

6.1.4 Aim of this chapter

Although the idea that early interactions with caregivers constitute the foundation of adult relationships is relatively uncontroversial, further investigation is needed to determine to what extent these early interactions continue to influence the individuals' attachment and what are the role of partners and romantic relationship experiences on the current attachment security? Therefore, the present chapter aims to investigate the origin of influences on general attachment security in relationships (i) whether attachment to parents or partner predicts the general partner attachment security, (ii) the influence of the first and last relationship experiences (i.e. breakup) on general partner attachment security, (iii) whether the experience of first romantic relationship breakup override any security derived from parental attachment and (iv) lastly, to investigate whether predictors of general partner attachment security differ across different countries such as Turkey, the Turkish Republic of Northern Cyprus, the United Kingdom and Czech Republic.

It is expected for the influence of parents on attachment style to decrease over time. As people start to engage in longer, more serious romantic relationships, these would potentially increasingly influence attachment patterns, independently of the effects of parental behaviour. Therefore, one hypothesis might be that the partner attachment anxiety and avoidance relating to a current or last partner should better predict an individual's general partner attachment anxiety and avoidance in relationships compared to parental attachment.

Relationship experiences such as having a bad breakup might affect the extent to which individuals rely on their parents and partners. Therefore, in individuals who had a good first relationship breakup, I expect parents to be a better predictor of general partner attachment security. On the contrary, in individuals who had a bad first relationship experience, I expect the effect of the first partner to be more important and hence a better predictor of general partner attachment security.

6.2 Methods

6.2.1 Participants

A total of 461 (*Female* = 367, *Male* = 90, *No answer* = 4) participants from the United Kingdom, Czech Republic, Turkey, the Turkish Republic of Northern Cyprus and other countries participated in this study. The UK participants were recruited from the University of Stirling's participant pool, Turkish and Turkish Cypriot participants from the researcher's social media accounts, and the Czech participants were recruited with the help of collaborators at the Charles University, Prague. The mean age of the participants was 27.15 (*SD* = 9.99) and ranged between 18-60 years. Sociodemographic information of the participants can be found in Table 6.1.

Table 6. 1 Sociodemographic characteristics of participants

Country	UK <i>n</i> = 208	Czech Republic <i>n</i> = 145	TRNC <i>n</i> = 51	TR <i>n</i> = 30	Other ¹ <i>n</i> = 27	Total <i>n</i> = 461
Gender						
Male	37	23	15	11	4	90
Female	169	121	36	18	23	367
No answer	2	1	0	1	0	4
Age						
Mean	25.56	27.53	34.67	28.30	21.70	
± <i>SD</i>	4.24	7.27	10.92	6.27	6.31	
Family size						
Mean	4.24	3.69	4.82	4.07	3.84	
± <i>SD</i>	1.35	1.24	1.57	1.64	1.57	
Living with parents						
Yes	86	36	21	18	6	167
No	121	108	27	11	21	288
No answer	1	1	3	1	0	6
Age of leaving parental house						
Mean	18.83	20.25	21.56	19.60	18.67	
± <i>SD</i>	2.91	3.09	3.85	5.21	2.54	

¹Other = Austria, Bolivia, Brazil, Bulgaria, Finland, France, Greece, Hungary, India, Ireland, Italy, Poland, Romania, Slovenia, Spain, USA

6.2.2 Procedure

The study was designed online in Qualtrics. The online survey was available to be completed in three different languages: English, Turkish and Czech. The translation of the survey to Turkish and Czech was done by native speakers. Upon agreeing to take part in this study and providing written consent, participants were first directed to answer a couple of sociodemographic questions (gender, age, country, family size etc.), then to complete the Experiences in Close Relationships (ECR-RS) scale for mother, father, last/current partner and the general partner (see below) and lastly, participants were asked to answer some questions about their family and their previous and current romantic relationships.

The relationship questions included questions such as; whether participants had a first serious relationship before, how old were they when that relationship happened and on a scale of 1-10 how broken-hearted they were left after that relationship ended. Same questions were asked regarding their last (not the current) relationship, and how broken-hearted they were left after their last relationship ended and finally, they are asked if they are currently in a relationship.

6.2.3 Materials

The Experiences in Close Relationships (Relationship Structures)- ECR-RS Scale

In this chapter, the same ECR-RS scale (Fraley, Heffernan, Vicary, & Brumbaugh, 2011) was used to assess participants' attachment-related *anxiety* and attachment-related *avoidance* (see chapter 2.2.3). The difference from previous chapters was that in the current study the scale was administered for mother, father, last/current partner, and generally thinking about partners. Cronbach's alpha reliability estimates in this sample were the following: "mother domain" $\alpha_{\text{avoid}} = 0.90$, $\alpha_{\text{anx}} = 0.76$; "father domain" $\alpha_{\text{avoid}} = 0.91$, $\alpha_{\text{anx}} = 0.79$; "last/current partner domain" $\alpha_{\text{avoid}} = 0.90$, $\alpha_{\text{anx}} = 0.83$; "general partner domain" $\alpha_{\text{avoid}} = 0.89$, $\alpha_{\text{anx}} = 0.92$.

6.2.4 Statistical analysis

Statistical analyses were performed with IBM SPSS statistics 25. Attachment-related avoidance and anxiety were computed for each interpersonal target separately (mother, father, last/current partner, and general partner). The avoidance score was computed by averaging items 1-6, while reverse keying the first 4 items and the anxiety score was computed by averaging items 7-9. After calculating the attachment-related avoidance and anxiety scores, Pearson correlations indicated a moderate positive correlation between

mother's and father's attachment avoidance ($r = .44$) and a strong positive correlation between mother's and father's attachment anxiety ($r = .61$). As including both of these correlated variables into a regression model would violate assumptions of independence between predictor variables (multicollinearity), a single parental avoidance and a single parental anxiety variable was created by averaging mother and father attachment avoidance/anxiety scores.

First, I ran the multiple regression model for avoidance dimension, general partner attachment avoidance being the DV, and parental and partner attachment avoidance scores being the IVs. There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.986. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. I found no evidence of multicollinearity, as tolerance values were greater than 0.1 (the lowest was 0.949). There were no leverage values greater than 0.2, and values for Cook's distance above 1. The assumption of normality was met, as assessed by a Q-Q Plot.

Then, I ran the multiple regression analysis for the anxiety dimension, general partner attachment anxiety was the DV, parental and partner attachment anxiety were the IVs. Linearity was assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.899. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. Tolerance values were greater than 0.1 (the lowest was 0.889), so there was no problem with collinearity. There were no leverage values greater than 0.2, and values for Cook's distance above 1. The assumption of normality was met, as assessed by a Q-Q Plot.

Afterwards, I tested the influence of the first relationship, especially the first breakup, on attachment security. Participants were asked to indicate how broken-hearted they were on a scale of 1-10 (1 = not broken-hearted at all, 10 = very broken-hearted) after their first romantic relationship ended. Participants who scored 5 and under were classified as not broken-hearted and participants who scored 6 and above were classified as broken-hearted. Then, the data file was split by broken-heartedness and the same multiple regression model was run for each attachment dimension to determine whether having an easy or difficult breakup affects the extent to which individuals rely on their parents or partners. All assumptions were met prior to the study.

Next, I wanted to run a multiple regression model with first relationship broken-heartedness and last relationship broken-heartedness as IVs and general partner attachment as the DV. The model was run for anxiety and avoidance dimensions separately. All assumptions were met prior to the analysis.

Finally, to determine whether there was a cultural difference in terms of general partner attachment predictors, multiple regression models were run separately for avoidance and anxiety dimensions with parental attachment and partner attachment as IVs and general partner attachment as the DV for each country. All the assumptions were checked and met the criteria before the analysis.

6.3 Results

6.3.1 The origin of influences on general partner attachment

In order to determine how much of the variation in general attachment in romantic relationships can be explained by parental and partner attachment, multiple regression analyses were run for two attachment dimensions separately.

The multiple regression model statistically significantly predicted general partner attachment avoidance, $F(2, 458) = 196.331, p < .001, \text{adj } R^2 = .46$. Both variables added statistically significantly to the prediction, $p < .001$. However, partner avoidance contributed more than parental avoidance. Regression coefficients and standard errors can be found in Table 6.2.

Table 6. 2 Multiple regression results for general partner attachment avoidance

General Avoidance	<i>B</i>	95% CI for <i>B</i>		<i>SE B</i>	β	R^2	ΔR^2
		<i>LL</i>	<i>UL</i>				
Model						.46	.46***
Constant	.80***	.56	1.04	.12			
Parental Avoidance	.12***	.06	.18	.03	.14***		
Partner Avoidance	.54***	.48	.60	.03	.64***		

Note. Model = "Enter" method in SPSS Statistics; *B* = unstandardized regression coefficient; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of the coefficient; β = standardized coefficient; R^2 = coefficient of determination; ΔR^2 = adjusted R^2 . * $p < .05$. ** $p < .01$. *** $p < .001$

The multiple regression model statistically significantly predicted general partner attachment anxiety $F(2, 458) = 312.007, p < .001, \text{adj } R^2 = .58$. While partner attachment anxiety significantly predicted the general partner attachment anxiety ($p < .001$), parental attachment anxiety did not $p = .603$. Regression coefficients and standard errors can be found in Table 6.3.

Table 6. 3 Multiple regression results for general partner attachment anxiety

General Anxiety	<i>B</i>	95% CI for <i>B</i>		<i>SE B</i>	β	R^2	ΔR^2
		<i>LL</i>	<i>UL</i>				
Model						.58	.58***
Constant	.84***	.58	1.09	.13			
Parental Anxiety	.02	-.06	.11	.04	.02		
Partner Anxiety	.80***	.73	.87	.03	.75***		

Note. Model = “Enter” method in SPSS Statistics; *B* = unstandardized regression coefficient; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of the coefficient; β = standardized coefficient; R^2 = coefficient of determination; ΔR^2 = adjusted R^2 . * $p < .05$. ** $p < .01$. *** $p < .001$.

6.3.2 Influence of the first romantic relationship breakup

The multiple regression model with participants who were classified as broken-hearted statistically significantly predicted general partner attachment avoidance $F(2,164) = 59.514, p < .001, \text{adj } R^2 = .41$. While partner attachment avoidance significantly predicted the general partner attachment avoidance ($p < .001$), parental attachment avoidance did not, $p = .67$. Similarly, participants who were classified as not broken-hearted after the first relationship breakup also statistically significantly predicted the general partner attachment avoidance $F(2,61) = 18.489, p < .001, \text{adj } R^2 = .36$. Partner attachment avoidance significantly predicted general partner attachment avoidance. However, parental attachment avoidance was not significant $p = .092$. Regression coefficients and standard errors can be found in Table 6.4.

Table 6. 4 Multiple regression results for general partner attachment avoidance for broken-hearted and not broken-hearted individuals

General Avoidance	<i>B</i>	95% CI for <i>B</i>		<i>SE B</i>	β	R^2	ΔR^2
		<i>LL</i>	<i>UL</i>				
<i>Broken-hearted</i>							
Model						.42	.41***
Constant	1.28***	.88	.26	.20			
Parental Avoidance	.02	-.08	.13	.05	.03		
Partner Avoidance	.52***	.42	.62	.05	.64***		
<i>Not broken-hearted</i>							
Model						.38	.36***
Constant	1.1**	.44	1.77	.33			
Parental Avoidance	.13	-.02	.28	.08	.17		
Partner Avoidance	.43***	.28	.58	.08	.58***		

Note. Model = “Enter” method in SPSS Statistics; *B* = unstandardized regression coefficient; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of the coefficient; β = standardized coefficient; R^2 = coefficient of determination; ΔR^2 = adjusted R^2 . * $p < .05$. ** $p < .01$. *** $p < .001$.

As for anxiety dimension, the multiple regression model was statistically significant in both broken-hearted, $F(2,164) = 95.96$, $p < .001$, adj $R^2 = .53$ and not broken-hearted individuals $F(2,61) = 35.782$, $p < .001$, adj $R^2 = .53$. While partner attachment anxiety significantly predicted the general partner attachment anxiety in broken-hearted individuals, parental attachment anxiety did not, $p = .671$. Likewise, partner attachment anxiety was a predictor of general partner attachment anxiety in not-broken hearted individuals, while parental attachment anxiety was not significant $p = .999$. Regression coefficients and standard errors can be found in Table 6.5.

Table 6. 5 Multiple regression results for general partner attachment anxiety for broken-hearted and not broken-hearted individuals

General Anxiety	<i>B</i>	95% CI for <i>B</i>		<i>SE B</i>	β	R^2	ΔR^2
		<i>LL</i>	<i>UL</i>				
<i>Broken-hearted</i>							
Model						.54	.53***
Constant	1.15***	.69	1.62	.24			
Parental Anxiety	-.03	-.18	.12	.08	-.02		
Partner Anxiety	.76***	.65	.87	.06	.74***		
<i>Not broken-hearted</i>							
Model						.54	.53***
Constant	1.17**	.44	1.91	.37			
Parental Anxiety	.00	-.24	.24	.12	.00		
Partner Anxiety	.73***	.55	.90	.09	.74***		

Note. Model = “Enter” method in SPSS Statistics; *B* = unstandardized regression coefficient; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of the coefficient; β = standardized coefficient; R^2 = coefficient of determination; ΔR^2 = adjusted R^2 . * $p < .05$. ** $p < .01$. *** $p < .001$.

6.3.3 The effects of first and last relationship broken-heartedness

The multiple regression model for general attachment avoidance was not statistically significant $F(2,140) = 1.421$, $p = .245$, adj $R^2 = .006$. Both first relationship broken-heartedness and last relationship broken-heartedness failed to predict the general partner attachment avoidance $p > .05$. Similarly, the multiple regression model for general partner attachment anxiety was not statistically significant $F(2,140) = .204$, $p = .816$, adj $R^2 = .011$. Likewise, neither first relationship broken-heartedness nor last relationship broken-heartedness predicted the general partner attachment anxiety $p > .05$. The partial regression plots (Figure 6.1) show no linear relationship between each independent and dependant variable.

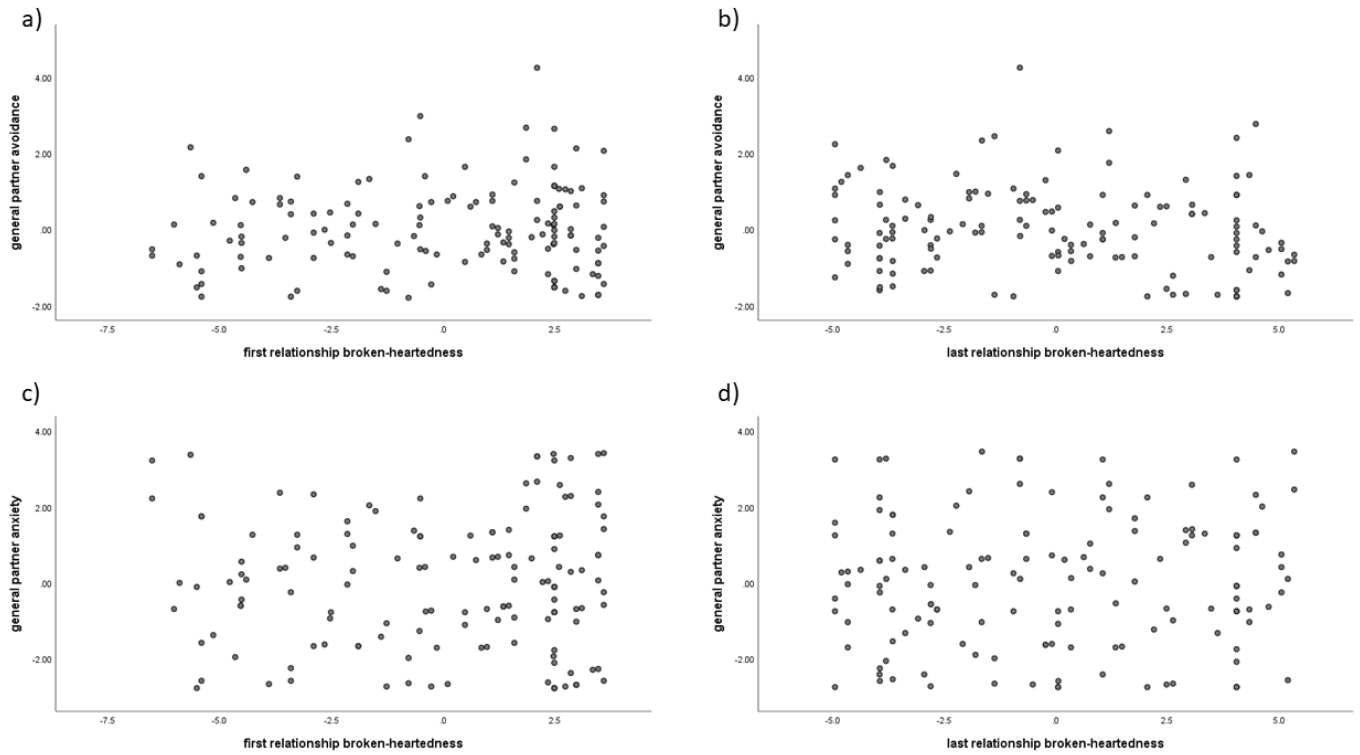


Figure 6. 1 Partial regression plots of general partner attachment avoidance (a,b) and general partner attachment anxiety (c,b) with first relationship broken-heartedness and last relationship broken-heartedness

6.3.4 Cultural differences in general partner attachment security

The multiple regression model for each country statistically significantly predicted the general partner attachment avoidance; Czech Republic $F(2,142) = 86.702, p < .001, \text{adj } R^2 = .54$, Turkey $F(2,27) = 17.391, p < .001, \text{adj } R^2 = .53$, Turkish Republic of Northern Cyprus $F(2,48) = 10.867, p < .001, \text{adj } R^2 = .28$, United Kingdom $F(2,205) = 88.34, p < .001, \text{adj } R^2 = .46$ and other $F(2,24) = 5.696, p < .01, \text{adj } R^2 = .27$. While in Czech Republic, Turkey, TRNC and other countries the partner attachment avoidance and not the parental attachment avoidance predicted the general partner attachment avoidance, in UK both parental and partner attachment avoidance predicted the general partner attachment avoidance, $p < .05$. Regression coefficients and standard errors can be found in Table 6.6.

Table 6. 6 Multiple regression results for general partner attachment avoidance for each country

General Avoidance	<i>B</i>	95% CI for <i>B</i>		<i>SE B</i>	β	<i>R</i> ²	ΔR^2
		<i>LL</i>	<i>UL</i>				
<i>Czech Republic</i>							
Model						.55	.54***
Constant	.77***	.37	1.16	.20			
Parental Avoidance	.09	-.02	.20	.06	.10		
Partner Avoidance	.64***	.53	.75	.06	.70***		
<i>Turkey</i>							
Model						.56	.53***
Constant	.40	-.42	1.21	.40			
Parental Avoidance	-.00	-.24	.24	.12	-.01		
Partner Avoidance	.78***	.46	1.10	.16	.75***		
<i>TRNC</i>							
Model						.31	.28***
Constant	1.09*	.18	2	.46			
Parental Avoidance	.03	-.20	.27	.12	.04		
Partner Avoidance	.53***	.28	.77	.12	.55***		
<i>United Kingdom</i>							
Model						.46	.46***
Constant	.79***	.43	1.14	.18			
Parental Avoidance	.13**	.04	.23	.05	.15**		
Partner Avoidance	.52***	.44	.60	.04	.64***		
<i>Other</i>							
Model						.32	.27**
Constant	1.36*	.19	2.53	.57			
Parental Avoidance	.16	-.09	.34	.12	.22		
Partner Avoidance	.41**	.15	.67	.13	.55**		

Note. Model = “Enter” method in SPSS Statistics; *B* = unstandardized regression coefficient; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of the coefficient; β = standardized coefficient; *R*² = coefficient of determination; ΔR^2 = adjusted *R*². **p* < .05. ***p* < .01. ****p* < .001.

As for anxiety dimension, similarly the multiple regression model for each country statistically significantly predicted the general partner attachment anxiety; Czech Republic $F(2,142) = 52.004, p < .001, \text{adj } R^2 = .42$, Turkey $F(2,27) = 19.275, p < .001, \text{adj } R^2 = .56$, Turkish Republic of Northern Cyprus $F(2,48) = 56.773, p < .001, \text{adj } R^2 = .69$, United Kingdom $F(2,205) = 200.908, p < .001, \text{adj } R^2 = .66$, other $F(2,24) = 5.535, p < .05, \text{adj } R^2 = .26$. In all the countries listed above, the partner attachment anxiety and not the parental attachment anxiety predicted the current general partner attachment anxiety, $p < .05$. Regression coefficients and standard errors can be found in Table 6.7.

Table 6. 7 Multiple regression results for general partner attachment anxiety for each country

General Anxiety	<i>B</i>	95% CI for <i>B</i>		<i>SE B</i>	β	<i>R</i> ²	ΔR^2
		<i>LL</i>	<i>UL</i>				
<i>Czech Republic</i>							
Model						.42	.42***
Constant	1.32***	.81	1.82	.25			
Parental Anxiety	-.09	-.28	.11	.10	-.06		
Partner Anxiety	.72***	.58	.87	.08	.67***		
<i>Turkey</i>							
Model						.59	.56***
Constant	.24	-.95	1.43	.58			
Parental Anxiety	.11	-.29	.51	.20	.10		
Partner Anxiety	.90***	.47	1.32	.21	.70***		
<i>TRNC</i>							
Model						.70	.69***
Constant	1.18**	.53	1.82	.32			
Parental Anxiety	-.11	-.32	.11	.11	-.08		
Partner Anxiety	.76***	.61	.90	.07	.86***		
<i>United Kingdom</i>							
Model						.66	.66***
Constant	.56**	.20	.92	.18			
Parental Anxiety	.04	-.08	.16	.06	.03		
Partner Anxiety	.88***	.78	.97	.05	.81***		

<i>Other</i>						
Model					.32	.26*
Constant	1.17*	-.24	2.57	.68		
Parental	.32	-.03	.66	.17	.32	
Anxiety						
Partner Anxiety	.47*	.07	.86	.19	.42*	

Note. Model = “Enter” method in SPSS Statistics; *B* = unstandardized regression coefficient; CI = confidence interval; *LL* = lower limit; *UL* = upper limit; *SE B* = standard error of the coefficient; β = standardized coefficient; R^2 = coefficient of determination; ΔR^2 = adjusted R^2 . * $p < .05$. ** $p < .01$. *** $p < .001$.

6.4 Discussion

The main aim of this study was to determine whether parental attachment (attachment to mother and father) or romantic attachment predicts the general partner attachment security in relationships. Secondary aims of the current study were to investigate the influence of first and last relationship broken-heartedness on attachment and compare the cultural differences in terms of prediction of the general partner attachment security in relationships.

Bowlby (1969) stated that attachment bonds are from cradle to grave and our attachment style in adulthood is shaped by our previous interactions with our parents. He suggested that people who had a secure attachment style as a child will grow up to be secure in their romantic relationships. Previous research shows a modest degree of overlap between how secure individuals feel with their mother and how secure they feel with their romantic partners. For instance, it was found that over 65% of individuals who were securely attached to their mothers were likely to be secure with their romantic partners as well (Baumeister & Vohs, 2007). Therefore, the current study aimed to test whether attachment to parents or the partner or both predicts the general partner attachment security in romantic relationships.

6.4.1 The origin of influences on general partner attachment security (parents vs partners)

The results of this study revealed that both parental and partner attachment avoidance were significant predictors of general partner attachment avoidance. For general attachment anxiety, however, only partner attachment was a significant predictor of general partner attachment anxiety. This suggests that parental attachment does not influence the general partner attachment anxiety. Attachment anxiety is about being preoccupied with

relationships and worrying about being abandoned. Therefore, previous experiences with partners in romantic relationships might override the security derived from parents and influence the general attachment security in romantic relationships.

6.4.2 Influence of the first and last relationship breakup

Hazan & Shaver (1987) considered romantic love to be an attachment process. Therefore, it is predicted that the first romantic relationship plays an important role in an individual's life and the very first breakup experience might influence subsequent relationships. Individuals shift their attachment from parents to friends and from friends to partners as they grow older (Cohen, 2004). However, it is believed that early relationships with parents constitute the foundation of attachment in adulthood.

The current study tested whether having a bad first relationship breakup would affect the extent to which individuals rely on their parents or their partner. The hypothesis was that parental attachment would be a better predictor of general partner attachment in those who had an easy first breakup (not broken-hearted) as the effect of the partner will not be that powerful. Contrary to expectations, in both individuals who were broken-hearted and not broken-hearted after the first breakup, partner attachment and not the parental attachment was the predictor of the general partner attachment security in both anxiety and avoidance dimensions. These findings suggest that attachment to parents might have an influence on general attachment to a certain extent, however, attachment to partners predicts the general attachment security in relationships. It also shows that, regardless of the nature of the first relationship experience, individuals move from their parental attachment styles to partners.

As the results showed that attachment to partners is a better predictor of general attachment in romantic relationships, and after the first relationship breakup individuals seem to shift from parental attachment to partners, I wanted to test whether the first relationship broken-heartedness or last relationship broken-heartedness predict the general attachment security. Previous research found an influence of breakup on attachment security (Ruvolo et al., 2001). However, in the present study, neither the first breakup broken-heartedness nor the last breakup broken-heartedness had a direct influence on general partner attachment security. Therefore, how broken-hearted individuals feel after the breakup does not influence the attachment security towards partners. It might influence the immediate subsequent relationship after the breakup, however, it does not seem to influence the general partner attachment security.

6.4.3 Cultural differences in general partner attachment security

The secondary aim of this study was to investigate and compare the cultural differences in terms of the predictor of general partner attachment security. The hypothesis was that in collectivist, family-oriented, more traditional countries such as, Turkey and the Turkish Republic of Northern Cyprus, the parental influence would be higher and attachment to parents would be the better predictor of general partner attachment security in relationships compared to individualist countries such as, the Czech Republic and the United Kingdom which promote self-independence in child-rearing. The results of this study revealed that across all the countries (apart from the UK), attachment to partners (not parents) was the predictor of the general partner attachment anxiety and avoidance. Contrary to expectations, in the UK sample, both parental and partner attachment avoidance predicted the general partner attachment avoidance. It could be the case that having an avoidant attachment style with parents might influence the subsequent romantic relationships and hence the general attachment security towards the partners. The United Kingdom is considered to have an individualist culture that is associated with high attachment avoidance. Nevertheless, the reason why this pattern only occurred in the UK sample needs to be further investigated.

6.4.5 Limitations and future suggestions

The findings of this study have to be seen in light of some limitations. The first is the distribution of the sample size across the countries. The UK and the Czech Republic constituted the majority of the sample size (45% and 31% respectively) while Turkey and TRNC constituted a smaller portion. This might influence the comparability of the results. A future cross-cultural study might consider recruiting an equal sample size across countries to allow fair comparability. The online survey used for data collection was translated in Turkish and Czech from English by bilingual researchers and then, the translations and wording were checked again by a bilingual. Even though this is undoubtedly a good technique, it has little control over the equivalence of wording. The actual meaning of some words might have been inevitably lost in the translation.

In the current study, the influence of the first relationship was explored by how heartbroken individuals were left after the relationship ended and how that influenced the predictor of the current general partner attachment security. Individuals hold mental representations/working models as a result of their early parental interactions, and they look for relational experiences that are consistent with those expectations (Bowlby, 1973).

Hence, it is most likely that individuals enter their first ever romantic relationship with those working models that they hold as a function of their caregiving experiences. Therefore, the effects of the first relationship experience need to be further investigated for a better understanding of its influence on attachment security. Future research could include the number of years passed since that breakup as a covariate to investigate the long-term influences.

The present study helps us to understand the origin of influences on current general partner attachment security and to what extent parental and partner attachment are similar. Further investigation is needed to understand the possible reasons why the main source of attachment shifts from parents to partners and to explain the reasons behind the variation of attachment styles across cultures.

Chapter 7: General Discussion

7.1 Introduction

As described in Chapter 1, stability of attachment has been discussed by many researchers over the years. While most have focused on stability and change during childhood, some have investigated subsequent changes in adolescence and adulthood. Previous research mainly focused on the frequency and incidence of change in individuals' attachment characteristics, but did not further investigate the possible causes of that change. Although attachment patterns are believed to be relatively stable, they are prone to change depending on various life experiences (Gillath, Karantzas, & Fraley, 2016c). These life events could be as drastic as loss of a loved one or a relationship dissolution.

In this thesis, I sought to explore the stability of attachment in different circumstances by testing conditional changes dependent both on current circumstances in the very short term (chapter 2, 3 and 4) and in the medium-term (chapter 5), as well as more long-lasting cultural differences (chapter 6). I also further investigated Bowlby's (1969) claim that early experiences with caregivers continue to influence the attachment of individuals in their romantic relationships by exploring whether parental or partner attachment predicts the general partner attachment security in relationships. I approached the research questions from an evolutionary perspective, which suggests that variation in the social environment and individuals' physiological state might have effects on attachment.

7.2 Summary of the results

In the first part of the thesis (chapters 2, 3 and 4), I aimed to test the stability of attachment and conditional changes depending on the current experiences and perceived environment in the short term.

Chapter 2 tested whether manipulation of individuals' self-perceived mate value would influence partner attachment security. Mate value indicates the desirability of an individual as a potential mate and is associated with attractiveness (Arnocky, 2018; Li, Bailey, Kenrick, & Linsenmeier, 2002; Pawłowski & Dunbar, 1999). Individuals' self-perceived mate value was manipulated by showing them either attractive, unattractive or a mixture of attractive and unattractive same-sex facial images and their attachment anxiety and avoidance to a partner and friend were measured before and after the images. The manipulation of self-perceived mate value did not affect individuals' self-perceived attractiveness, as they gave similar scores to their perceived attractiveness before and after the manipulative condition. However, it did influence partner attachment security. After

seeing attractive same-sex faces, men increased their partner attachment avoidance and decreased their friend attachment avoidance, while women maintained relatively same scores. It was also noted that men who had a recent breakup scored higher on partner attachment anxiety after seeing a mixture of attractive and unattractive same-sex faces compared to men who did not have a recent breakup. The findings of this study indicate that attachment security in adult relationships could be altered depending on the changes in the perceived social environment.

Following the findings of the first study, chapter 3 sought to investigate the conditional changes in attachment security depending on the varied operational sex ratio (OSR). The OSR indicates the ratio of sexually active males to females that are ready to mate (Kvarnemo & Ahnesjö, 1996). According to the evolutionary perspective, variation in OSR determines the intensity of the mate competition. Abundant sex will compete with each other to mate and rare sex will be more valuable in the mating market (Fisher, 1958; Kvarnemo & Ahnesjö, 1996). As variation in OSR influences mating dynamics, it was hypothesised that it would also influence the partner attachment security. Individuals' perceived operational sex ratio was manipulated by showing them either male-biased, female-biased or equal ratio of male and female faces. Their partner attachment security was measured twice, before and after the manipulative condition. Results revealed that partnered men in female-biased OSR increased their partner avoidance compared to single men, while there was no significant change in women. Furthermore, women in female-biased OSR who had a recent breakup increased their partner attachment anxiety and decreased their partner attachment avoidance compared to women who did not have a recent breakup. The findings of this study confirm that adult attachment is flexible and can change in the short-term, depending on the perceived social environment.

As the previous two studies found relationship experiences to influence adult attachment, chapter 4 aimed to investigate whether exposing individuals to relationship breakdown cues would influence their partner attachment security. Romantic relationships play a significant role in young individuals' life and relationship dissolution is considered to be a stressful event (Tashiro, Frazier, & Berman, 2006). Previous studies found a link between relationship dissolution and change in attachment security as individuals who had a breakup became more insecure (Kirkpatrick & Hazan, 1994; Ruvolo, Fabian, & Ruvolo, 2001). Therefore, in this chapter, to test the effects of relationship dissolution on attachment further, participants were randomly assigned to read a relationship scenario where they were either (a) initiating breakup with a partner, (b) getting broken up with by a

partner or (c) a happy relationship. Participants' attachment security was measured before and after they read the scenario. Results revealed that women who had a recent breakup and read the scenario of initiating breakup with a partner significantly decreased their partner attachment anxiety scores compared to women who did not have a recent breakup. On the other hand, men who had a recent breakup and read the initiating breakup with a partner scenario significantly increased their partner attachment avoidance scores compared to men who did not report a recent breakup experience. The findings of this study indicate recent relationship dissolution to be a strong predictor of change in attachment security. This chapter emphasises the influence of relationship experiences on attachment and provides further support that relationship dissolution causes a change in partner attachment security.

The second section of the thesis focused on conditional changes in the long term and long-lasting cultural differences. In Chapter 5, congruency in hormonal contraception use and its influences on partner attachment security was tested. Previous studies found oral contraception use at the beginning of relationship formation to influence relationship satisfaction (Roberts et al., 2012) and congruency in previous and current OC use was a predictor of women's sexual satisfaction with the partner (Roberts et al., 2014). As congruency in OC use, in general, have an effect on relationship satisfaction, it was hypothesised that congruency in OC use could also influence partner attachment security. The congruency hypothesis suggests happier relationships. However, on the contrary, the results of this study showed that congruency in OC use influences partner attachment anxiety. Women who were OC users at the time of relationship formation and remained as OC users reported higher partner attachment anxiety than women who were no longer OC users. This indicates that hormonal changes caused by OC use alter the attachment security of women in relationships and make women more insecurely attached. This study holds high importance, as it was the first one that attempted to investigate the possible influences of OC use on partner attachment security. It also provides further evidence that women's attachment security could be changed depending on the hormonal changes caused by the continuation or discontinuation of hormonal contraception use.

Chapter 6 focused on more long-lasting cultural differences in attachment. It looked into the origin of influences on general attachment security in romantic relationships and whether attachment to parents or partners predicts the attachment security in romantic relationships and if it varies across different cultures. Bowlby (1973) suggested that, based on early caregiving experiences with the caregivers, children form internal working models

and these working models that children hold about themselves and others influence their relationships in adulthood. For example, if children are securely attached to their parents, they grow up to be secure in their romantic relationships. Therefore, individuals' attachment to parents should predict the attachment security in romantic relationships in adulthood. However, it is also believed that the main attachment figures shift from parents to peers in adolescence and peers to romantic partners in adulthood (Fraley & Davis, 1997). As partners become the primary attachment figures in adulthood, attachment to partners must influence the attachment security in romantic relationships the most. Therefore, chapter 4 investigated whether attachment to parents or partners predict the general attachment security in romantic relationships. In addition to that, it also looked into the influence of relationship experiences such as first and last relationship breakup and whether these experiences override any security derived from parental attachment. Lastly, it looked into the cultural differences on predictors of general attachment security in relationships by gathering data from individualist (United Kingdom, Czech Republic) and collectivist countries (Turkey, Turkish Republic of Northern Cyprus).

This study provided some insightful results. First, both parental attachment avoidance and partner attachment avoidance significantly predicted the general partner attachment avoidance in relationships, however, partner attachment avoidance contributed more than parental attachment avoidance. On the other hand, only partner attachment anxiety and not parental attachment anxiety was the predictor of general partner attachment anxiety in relationships. As for the influence of the first relationship breakup experience, partner attachment avoidance (but not parental attachment avoidance) was a significant predictor of general partner attachment avoidance in people who reported to be left broken-hearted after the first breakup. The same pattern occurred in individuals who were classified as not broken-hearted after the first breakup. Similarly, partner attachment anxiety but not the parental attachment anxiety was the main predictor of general partner attachment anxiety both in individuals classified as broken-hearted and not broken-hearted individuals. Then, another multiple regression model was run to investigate whether first or last relationship broken-heartedness predicts general partner attachment avoidance and anxiety in relationships. Neither first relationship broken-heartedness nor last relationship broken-heartedness predicted general partner attachment avoidance and anxiety. These findings suggest that how broken-hearted we feel after our very first relationship or our very last relationship does not influence individuals' attachment security in romantic relationships.

Finally, the predictors of general partner attachment security were investigated across four countries (UK, Czech Republic, Turkey, and TRNC). Results revealed that partner attachment anxiety and not parental attachment anxiety was the predictor of general partner attachment anxiety in relationships across the four countries. On the other hand, while the partner attachment avoidance was the main predictor of the general partner attachment avoidance in the Czech Republic, Turkey and TRNC, in the UK both partner and parental attachment avoidance were the significant predictors of general partner attachment avoidance in relationships. This chapter had immense importance in terms of helping us to understand the origin of influences on individuals' general attachment security in relationships and whether the parental or partner attachment has the biggest influence on it. It also shed light on the cultural differences in terms of predicting general attachment security.

7.3 Evolutionary perspective

Harlow and Zimmerman (1958) were among the first researchers that looked into attachment bonds from an evolutionary perspective. To understand the role of social relationships and attachment bonds on early development, they carried out a series of laboratory experiments that involved rhesus monkeys. In their first experiment, infant monkeys were separated from their mothers right after birth and were put in cages with two surrogate mothers, one made of a wire that provided food and one covered with a soft towelling cloth that did not provide any food. Their observations revealed that infant monkeys used the wire surrogate just to feed themselves and used the cloth surrogate as a safe base to seek comfort when scary items were placed in the cage. Harlow's experiments provided valuable insight on attachment theory by discovering that infants need to physically touch and cling to something for emotional comfort and provided with food will not be enough for forming an attachment bond like behavioural psychologists suggested.

On the other hand, Bowlby was inspired by Charles Darwin's theoretical vision. He gathered ideas from Darwin's theory of evolution by natural selection, evolutionary biology, object relations, control system theory to develop the attachment theory (Simpson, 1999). Bowlby (1969) believed that infants are born with an innate urge to form attachment bonds with their caregivers, which is adaptive and aids their survival. Therefore, his attachment theory is considered to have an evolutionary background. Considering the great importance of strong infant-caregiver bonds, evolutionary pressures must have allowed strong bonds to be formed at various stages of development beyond

infancy. According to Bowlby (1980), attachment behaviours involve various actions that increase proximity between infants and their caregivers. In order to establish and maintain proximity, young children demonstrate three types of behaviours, such as; signalling behaviours, aversive behaviours, and active behaviours (Belsky & Cassidy, 1994). For example, while signalling behaviours of children such as smiling or vocalising, bring the caregivers to their children for positive interactions, aversive behaviours (e.g., screaming, crying) attract caregivers to their children usually to stop those behaviours. On the other hand, active behaviours (e.g., following, approaching) help children to move towards their caregivers. Despite their phenotypic differences, these behaviours all serve the same biological purpose: to keep the helpless, vulnerable infant in close physical proximity to the caregiver and hence increase the infant's survival chances.

As seen above, evolutionary perspectives and approaches have been previously used by researchers to understand infant-caregiver attachment bonds. In this thesis, I tried to answer the research questions from an evolutionary perspective by varying the socioecological environment with manipulation of self-perceived mate value and operational sex ratio, and physiological state with hormonal contraceptive use on attachment. Investigating the stability of attachment from an evolutionary perspective brought novelty into the methods of adult attachment. The rationale of the thesis was that these or similar variations might have been recurrently experienced over the course of human evolution and hence, are likely to be potential triggers for adaptive responses.

Using an evolutionary perspective to test changes in individual's attachment security by manipulating their self-perceived mate value and operational sex ratio increased the generalisability of our results. It is possible that our self-perceived mate value could be affected if we are surrounded by attractive competitors in our daily lives and hence, this influences the partner attachment security in relationships. The operational sex ratio (OSR) is another fundamental concept in evolutionary biology that affects mating dynamics, aggression, relationships, etc. Today, many countries have biased operational sex ratios, such as; China and India (male-biased OSR), Latvia, Ukraine, and Belarus (female-biased OSR) (Anwar, 2018; Leibert, 2016). Using the OSR as a method to investigate the stability and change in partner attachment security allowed us to have a better understanding of romantic relationships and attachment dynamics in biased OSR geographic areas and countries. Hormonal variations in women influence the psychological processes that affect the formation and maintenance of human romantic relationships. Nowadays, birth control pills are highly used by women all over the world to prevent

unwanted pregnancies. The combined oral contraceptives contain exogenous hormones such as oestrogen and progesterone and these hormones are believed to alter the mate preferences in women by interrupting the normal levels of sex steroid and cyclical variation (Alvergne & Lummaa, 2010; Jones et al., 2005; Puts, 2006; Roberts, Gosling, Carter, & Petrie, 2008; Wedekind, Seebeck, Bettens, & Paepke, 1995). In this thesis, I tested whether congruency in OC use would also influence partner attachment security in relationships. The results of the study found congruency in OC use to influence partner attachment anxiety in women. Using this method to test change in partner attachment security is important as combined OCs are widely used by women around the world and knowing its influences on partner attachment security in relationships will be an important determinant on women's decisions on continuation or discontinuation in OC use.

7.4 What are the main drivers of attachment in adulthood? (Parents vs partners)

According to Bowlby's attachment model, attachment behaviours formed in childhood are believed to shape the attachment relationships in adulthood. Bowlby (1969) believed that attachment starts at infancy and continues throughout the life span, and once the internal working models are formed, it stays relatively the same. When a baby is born, he would need someone to take care of him. This person could be a parent, a sibling or a nanny. Regardless of whoever this person is, there will be an attachment bond formed. And, according to Bowlby and Ainsworth, this caregiver (usually the mother) would be the one that influences the child's personality and character the most.

This raises the question, whether attachment bonds formed with parents in infancy through early experiences continue to be the main attachment source in adulthood? Bowlby's attachment model viewed the mother as the primary attachment figure, while in fact, an infant can have the same attachment bond with the father and a sibling. According to Bowlby's model, attachment is confined in infancy and early childhood. His attachment model does not take into consideration of different attachments that form during adolescence with peers and in adulthood with romantic partners (Field, 1996). However, contrary to Bowlby's model, throughout the life span individuals form more than one attachment bond, such as; attachment to mother, father, friends, and partner. Even though the attachment bonds with the parents remain, the primary attachment figure shifts from parents to peers in adolescence and from peers to romantic partners in adulthood (Cohen, 2004). The results from chapter 6 provided support that individuals

have separate attachment bonds with different attachment figures and it is not only limited to parents. It also refutes Bowlby's claim that attachment to parents is the main determinant of the attachment in adult romantic relationships, as the results from chapter 6 showed that attachment to partners is a better predictor of general partner attachment security in relationships. This shows that in adulthood the parental attachment becomes less influential on relationships and attachment to partners through romantic relationship experiences become more influential on determining attachment security in relationships. The results also provided further evidence that in adulthood the primary attachment figures shift from parents to romantic partners (Doherty & Feeney, 2004).

According to Hazan & Shaver (1987), the emotional bonds that romantic partners have are similar to attachment bonds that infants and their caregivers have. Therefore, adult romantic relationships are believed to provide attachment functions as well. The three attachment styles identified by Ainsworth and colleagues (1978) were also found to apply to adult romantic relationships. It is no doubt that attachment to parents in infancy is crucial for survival, but as we grow older and start getting into romantic relationships, attachment to partners becomes more important in individuals' lives. We can still have a secure attachment with our caregivers and develop an insecure attachment style in romantic relationships, depending on our previous relationship experiences. It is possible that we use the attachment that we have with the primary caregivers as a model to guide our behaviours when we get into our first relationship, but then, according to our romantic relationship experiences, we form different attachment styles with the partners. Just like how infants show individual differences in their attachment styles depending on the interactions with the primary caregivers, adults can also show individual differences in their attachment to partners depending on their relationship experiences with the partners. For example, having a partner that is inconsistent, unavailable or distant might cause an insecure attachment style.

7.5 How stable is our attachment? (Stability and change in attachment security)

The main research questions that I wished to answer in this thesis were: (i) how stable attachment security in adulthood is and (ii) whether it changes depending on the perceived environment and current relationship experiences.

According to Bowlby (1973) working models developed in the early years of life through interactions with the caregivers guide how the attachment system functions in

relationships throughout the life span. Bowlby also suggested that individuals' working models become more stable from infancy to adulthood as they pay attention to, recall, interpret and act in a certain way that strengthen their relationship expectations and beliefs.

The stability and change in attachment representations from infancy to adulthood has been previously investigated by many researchers. However, longitudinal studies provided ambiguous support for assumptions of stability. For example, some studies found moderate to high level of stability from infancy to young adulthood (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000) and some found little to no stability (Lewis, Feiring, & Rosenthal, 2000). Furthermore, similar conflicting results were found investigating the stability in adult attachment. Some researchers interpreted their results as instability of attachment style (Baldwin & Fehr, 1995; Davila, Burge, & Hammen, 1997; Kirkpatrick & Hazan, 1994), while others interpreted the similar findings as stability of attachment (Keelan, Dion, & Dion, 1994; Klohnen & Bera, 1998; Scharfe & Bartholomew, 1994; Shaver & Brennan, 1992).

Even though previous researchers looked into stability in adult attachment, further research was needed to understand the possible factors that might cause a change in adult attachment. Hence, in this thesis, I aimed to test the stability and change in adult attachment security in different circumstances. According to some of the attachment theorists, change in attachment styles might occur if individuals have experiences that challenge their existing attachment representations (Bowlby, 1973; Fraley, 2002; Fraley & Brumbaugh, 2004; Mikulincer & Shaver, 2007; Sroufe, Egeland, & Kreutzer, 1990; Waters et al., 2000). For example, in secure individuals, having negative interactions (criticism, rejection) or relationship dissolution can cause a change in attachment style (Mikulincer & Shaver, 2007).

Previous research found relationship experiences, especially breakups, to influence individuals' adult attachment styles (Feeney & Noller, 1992; Ruvalo et al., 2001). In this thesis, individuals who had experienced a recent breakup (relationship dissolution) showed a change in attachment security compared to ones who did not have a recent breakup. For example, in chapter 2, there was a change in partner attachment anxiety among men who had a recent breakup after seeing a mixture of same-sex attractive and unattractive images. In chapter 3, women in the female-biased condition, who had a recent breakup, increased their partner attachment anxiety and decreased their partner attachment avoidance compared to women who did not have a recent relationship dissolution. Lastly, in chapter 4, both men and women who had a recent breakup changed their attachment security after

reading a scenario of initiating breakup with a partner compared to individuals who did not have a recent breakup. The findings from this thesis provided further support that negative life experiences, such as relationship dissolution, can cause a change in attachment security.

7.6 Overall conclusion

In this thesis, I tested the stability and change in adult attachment security in relationships in the very short-term depending on the current circumstances, as well as in medium-term and long-lasting changes depending on the culture, from an evolutionary perspective. I also looked into the origin of influences on general attachment security in relationships and investigated whether it is driven by parents or partners.

While the research presented provides interesting findings regarding the stability and change in adult attachment security in romantic relationships, it is important to note that there are some limitations and improvements which could be addressed in future research, specifically regarding study design. For example, for the manipulation of the self-perceived mate value, ten attractive and unattractive same-sex images were shown and rated. Even though these images were effective in the manipulation of the self-perceived mate value of the participants, they did not significantly influence participants' self-perceived attractiveness. Future studies might want to increase the number of images used or might want to consider using another method to manipulate the self-perceived mate value. The same images were used in Chapter 3 to manipulate participants' operational sex ratio. While men look at physical attractiveness for mating strategies, women look at social status and finances (Buss, 1989; Toro-Morn & Sprecher, 2003). Therefore, future research might want to include cues of social status and finances, along with attractive images, to create female-biased or male-biased OSR conditions. It would be also interesting to run the same study in geographical areas with biased OSR. For example, do women who live in a female-biased population have different partner attachment security than women who live in a male-biased population? Are they more anxiously attached to their partners as there is a higher intrasexual competition?

In this thesis, the stability of adult attachment in relationships was tested in the short-term, dependent on the current circumstances and more long-lasting changes. More research will be needed to understand the causes of those changes. Future research should further examine the role of romantic relationships on partner attachment security. The dynamics of every relationship are different. For example, we might have a secure

attachment style in one relationship and an insecure one in another relationship. Therefore, more research is needed to understand the influences of relationship experiences on partner attachment security.

In conclusion, this thesis shows that attachment is not simple; it is multifactorial and would depend on individuals' experiences and perceived environment. There are other factors in that multifactorial part of attachment other than partners, such as recent experiences, contraception use, and self-perceived mate value. Therefore, we should look at attachment styles in a more complex way. This thesis also provides evidence that there is more than one attachment bond and it is not all about parents. We form attachment bonds with different attachment figures other than parents, such as friends and romantic partners. In romantic relationships, attachment to current or last partner predicts the general attachment security and not our attachment to parents. This shows that our attachment is flexible and not parentally based, as Bowlby suggested. When it comes to romantic relationships, perhaps we move from parental attachment to partners and our experiences with partners in relationships determine the general partner attachment security. The current thesis provides a clear demonstration that even though Bowlby's parental based attachment theory and Hazan & Shaver's adult attachment theory have some similarities, these are two different kinds of attachments. Finally, the thesis provides ample evidence that attachment is flexible and it could change depending on the perceived environment and current experiences.

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Appendix A

The Experiences in Close Relationships – Relationship Structures Scale (Fraley, Heffernan, Vicary, & Brumbaugh, 2011)

Scale items:

1. It helps to turn to this person in times of need. (R)
2. I usually discuss my problems and concerns with this person. (R)
3. I talk things over with this person. (R)
4. I find it easy to depend on this person. (R)
5. I don't feel comfortable opening up to this person.
6. I prefer not to show this person how I feel deep down.
7. I often worry that this person doesn't really care for me.
8. I'm afraid that this person may abandon me.
9. I worry that this person won't care about me as much as I care about him or her.

Response format: 1 = Strongly Disagree ... 7 = Strongly Agree

(R) = Reverse scored

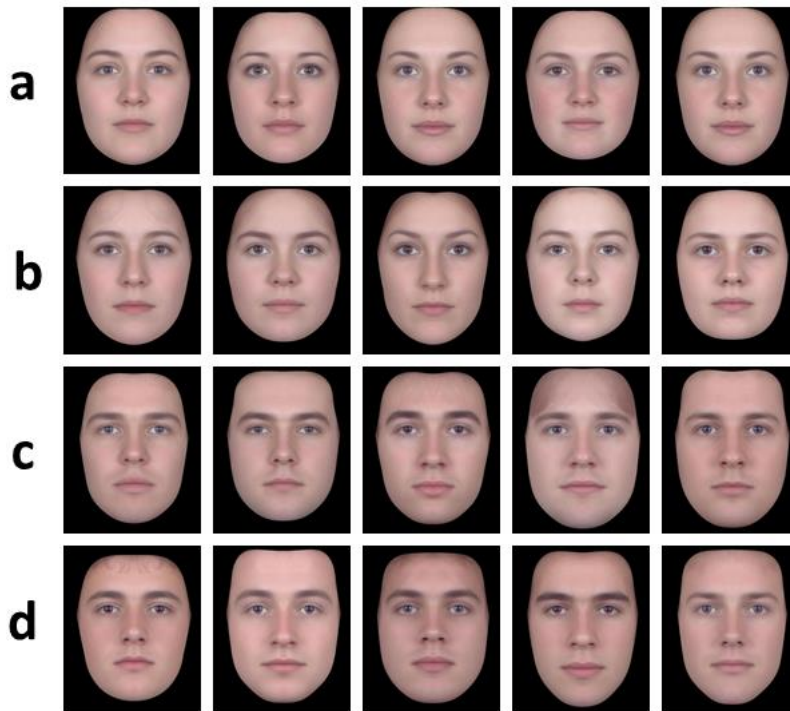
Subscale 1 (Attachment Avoidance): Items 1, 2, 3, 4, 5, 6

Subscale 2 (Attachment Anxiety): Items 7, 8, 9

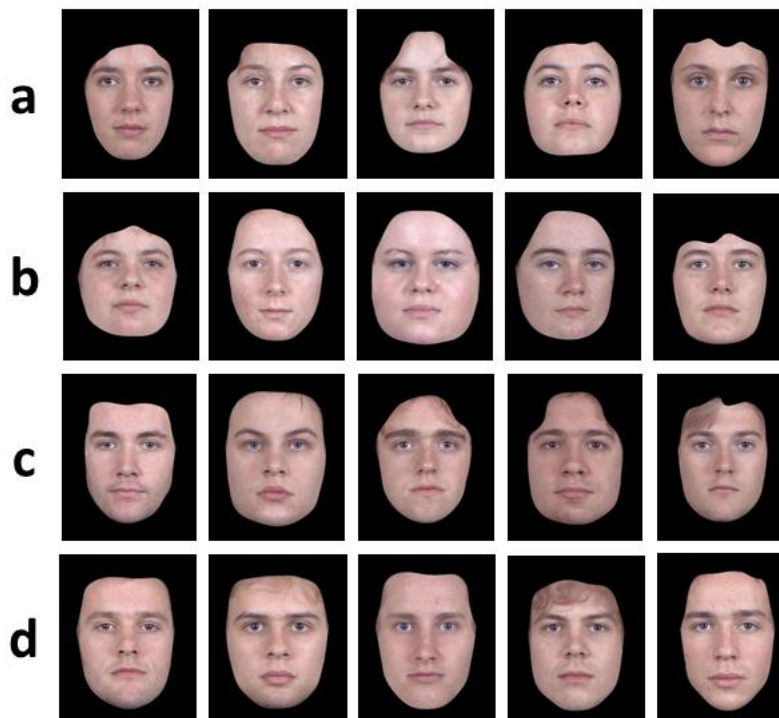
Appendix B

Composite images used in Chapter 2

1) Attractive female (a,b) and male (c,d) faces



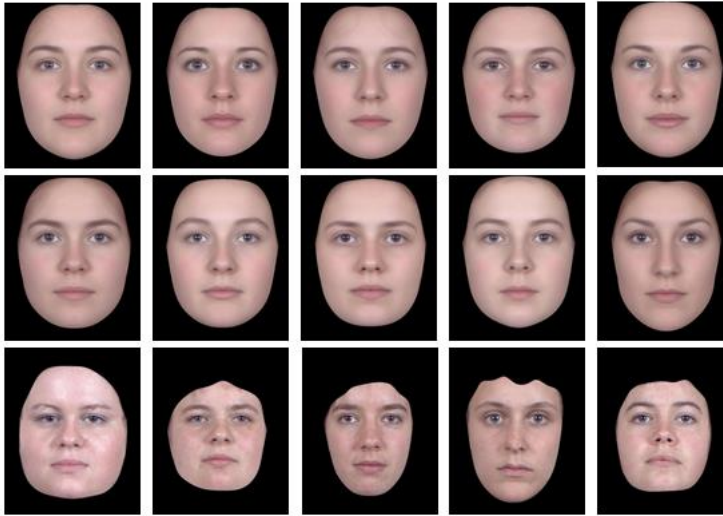
2) Unattractive female (a,b) and male (c,d) faces



Appendix C

Composite images used in Chapter 3

1) Female faces



2) Male faces

