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BIOLOGICAL SIBLINGS: CAN YOU TRUST THEM WITH YOUR MATE?

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A Thesis

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Elisha Maria Barron

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ABSTRACT

Recent studies suggest that genes may influence human mate preferences. What would this mean for same-sex siblings who share genes? Might they also share mate preferences and engage in mate poaching or would social norms and strong sibling bonds discourage such behaviors? We hypothesized that siblings would perceive their mate preferences to be more similar to their sibling's than to an average person of their same gender. It was also hypothesized that the association between perceived sibling mate preferences and sibling mate poaching would be moderated by sibling closeness and sibling competition. Additionally, it was hypothesized that sibling mate competition would be negatively associated with participants' investment in their niece(s) and/or nephew(s), that participants would report greater distress when thinking about a sibling poaching one of their mates compared to other relationship types and lastly, that men would be more likely to poach a sibling's mate than women. No statistically significant difference was found between perceived similarity in sibling mate preferences and non-sibling mate preferences. We were unable to test the role of sibling closeness and sibling competition in sibling mate poaching due to low variability in the sibling mate poaching scale; however qualitative analyses provided insight regarding the prevalence of and circumstances surrounding sibling mate poaching. Other findings included a small, negative correlation between sibling mate competition and investment in nieces and nephews, greater distress reported when thinking

about a sibling poaching one's mate versus others poaching a mate, and no significant difference in sibling mate poaching scores for men and women. Study limitations and directions for future research are reviewed.

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DEDICATION

I would like to dedicate this thesis to my beloved late grandparents, Beatrice Ramirez and Richard Ramirez. Thank you for loving me, supporting me and being so proud of me.

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CHAPTER ONE

LITERATURE REVIEW

Introduction

Biological siblings have things in common. They share approximately 50% of their genes, often espouse similar family values, and are frequently raised in comparable environments. Could they also be interested in similar mates? An overlap in mate preference could have important consequences for evolutionary-based goals. If siblings are romantically interested in the same person, they may experience intrasexual or mate competition with one another, which would threaten their reproductive success. What factors would influence poaching or stealing of a sibling's mate? What would cause an individual to cooperate with their sibling for mates rather than compete? To our knowledge, this topic has seldom been investigated. The current study aims to address these questions and extend the literature on the topic of sibling mate preferences and intrasexual competition.

Literature Review

Evolutionary Psychology

The field of evolutionary psychology has its origins in Darwin's theory of natural selection. The concept of natural selection refers to the conservation of adaptive genes through generations (Kapoor et al., 2012). Adaptive traits are the advantageous attributes that are preserved because they increase the likelihood

of survival and reproduction. Certain traits are adaptive in terms of meeting environmental demands and are therefore more likely to be inherited compared to traits that do not facilitate biological goals. Evolutionary psychology extends these principles to examine how natural selection has shaped psychological traits. Universal characteristics such as gender-specific mate preferences are explained according to their functional purpose for helping people survive and reproduce (Buss, 2007).

Human mate preference is an important topic in evolutionary psychology because reproduction, or spreading one's genes, is a primary biological goal. In order to reproduce, humans have had to overcome reproductive challenges (Buss, 1995; Buss, 2007). One challenge involves selecting a compatible, fertile mate. Preferences or cues exist to help individuals find a mate who will produce healthy offspring (Buss, 1995; Buss, 2007). Cues include signs of good health such as symmetrical faces and a healthy physique (Buss 2007; Fink et al., 2006). Some gender differences in mate preferences also exist. Men tend to value qualities such as youth, beauty, and a curvy figure (i.e., a waist-to-hip ratio of .70 to .79) because they signal that women will bear healthy children (Singh, 2002). Women tend to prefer wealthy men with a high status because such partners are assumed to have resources that will help with childrearing (Buss, 1995). Mate preference cues help people identify optimal mates with high quality genes.

Biological Influences in Mate Preferences

Research indicates that genes may influence the traits people seek in a potential mate, which can contribute to similar mate preferences between siblings. Assortative mating, which refers to selecting mates that proximate one's own genotype and/or phenotype, can influence siblings to couple with a certain type. For instance, facial resemblance within couples tends to be higher than is expected at random (Alvarez & Jaffe, 2004; Griffiths & Kunz, 1973; Hinsz, 1989; Zajonc et al., 1987). Positive assortative mating has been found for a variety of physical characteristics including weight, hair color, eye color, and stature (Allison, et al., 1996; Rushton et al., 1985).

Assortative mating extends beyond physical resemblance to include matching in personality characteristics, age, religion, socioeconomic status (SES), intelligence, occupational level, social beliefs, and family relatedness (Alvarez & Jaffe, 2004; Bon et al., 2013; Buss, 1985). This tendency has been found for people in both short and long-term relationships and in both married and unmarried couples (Hinsz, 1989). Therefore, siblings who share physical attributes, personality traits, or social beliefs, may find themselves attracted to mates who are similar to themselves, and ultimately to each other.

Although abundant research supports the premise of assortative mating, some scholars question the process (Bereczkei et al., 2002; Nojo et al., 2012). One opposing theory is that instead of matching based on one's own characteristics, humans use a mate selection strategy that resembles imprinting

in animals. This practice involves choosing a mate that physically resembles an opposite-sex parent. In support of this premise, Bereczkei and colleagues (2002) compared hundreds of family members' and control subjects' faces. Judges matched participants' spouses to their mother-in-laws more often than would be expected at random. In addition, a greater degree of similarity existed between participants' opposite-sex parents and their spouses compared to between the participants themselves and their spouses. Interestingly, the researchers found that participants were less likely to choose mates who matched their opposite-sex parent's physical features if they had experienced rejection from that parent, indicating that socialization influences the imprinting process (Bereczkei, et al., 2002; Nojo et al., 2012). Regardless of the driving force, both matching and sexual-imprinting result in humans choosing partners who are phenotypically similar to themselves. In fact, support has been found for both matching and imprinting in the same study (Nojo et al., 2012). These findings support the idea that siblings, who share genes and may be similar to each other, may be interested in like mates.

Although choosing a mate similar to oneself can be advantageous, too much similarity can be harmful. The potential harm for offspring as a result of inbreeding, or mating with a closely related person, has been well researched. Inbreeding increases the risk that offspring will experience fitness difficulties and/or inherit harmful diseases (Verweij, et al., 2014). When a person mates with someone whose genes are closely related to their own, the offspring are more

likely to be born with deleterious alleles (Lieberman & Smith, 2012; Verweij, et al., 2014).

Something as primitive as smell can be used to predict with whom a person should mate. To explore the role of body odor as a cue for mate preferences, Wedekind and colleagues (1995) examined how the major histocompatibility complex (MHC) may affect mate preferences in women. In mice, the MHC has been shown to influence mate preferences, which is hypothesized to avoid inbreeding. In Wedekind et al.'s study, male participants were instructed to use unscented soap when they showered and to sleep in the same t-shirt for two nights. Female participants were then asked to rate the scents of six different t-shirts. Results showed that odors were scored as more pleasant when the women and men's MHC differed. Moreover, women reported that the odors of men who were MHC-dissimilar reminded them of their current or past significant others (Wedekind et al., 1995). In a separate study, men showed a preference for t-shirts imbued with the scent of MHC-dissimilar women (Thornhill et al., 2003). Having immunities that are dissimilar to one's mate can provide benefits such as healthier offspring (Wedekind et al., 1995). Immunity dissimilarity may also benefit mates in terms of reducing the likelihood of passing along illness (e.g., flu virus) to the other (Christakis & Fowler, 2014).

Recent studies have examined attitudes toward inbreeding and cues people use to identify kin (Lieberman & Smith, 2012). In general, people feel disgusted when thinking about a sexual relationship with kin (Lieberman & Smith,

2012). Although individuals prefer similarity in a mate, kin cues signal that too much similarity may be evolutionarily disadvantageous. Humans weigh the costs and benefits of each mating arrangement and seek an optimal balance between similarity and inbreeding avoidance (Alvarez & Jaffe, 2004; Bateson, 1983; Blouin & Blouin, 1988). In a study examining humans' preference for facial resemblance, Debruine (2004) showed participants digitally transformed pictures that were edited to mirror their own physical features. Results indicated that facial resemblance had an impact on attractiveness ratings for same-sex faces more than opposite-sex faces. That is, when male participants were presented with photos of men and women who were physically similar to themselves, they rated photos of the men to be more attractive than the photos of women. Likewise, women's attractiveness judgments were higher for other women who looked similar to themselves more so than for men who bore a physical resemblance. These results imply that people are drawn to kin, but avoid inbreeding, which may lead to siblings having similar tastes when it comes to considering the physical appearance of potential mates (DeBruine, 2004).

In addition to the biological factors discussed, siblings are often raised in the same or comparable environments and may have similar interests and values, including qualities they seek in a mate. Rose et al. (1988) examined the effects of a shared environment and sibling contact above the effects of genetic influences on similarity of certain personality traits. The effects of sibling social contact were still significant when genetic influences were removed, indicating

that length of time living together and amount of contact impacted the similarity of siblings' scores on two personality traits (Rose, et al., 1988). Moreover, Burt (2009) conducted a meta-analysis to examine the effects of shared childhood environment on select psychological disorders. Shared environment accounted for approximately 10-30% of the variance when other factors were accounted for, and estimates did not differ between twin and adoption studies, indicating that the commonality could be attributed to shared living environment rather than genes (Burt, 2009). If shared environment influences similarity in personality traits and psychological disorders, it may also impact similarity regarding mate preferences.

To summarize, various biological factors influence mate preferences including assortative mating, body odor cues, and striking a balance between inbreeding and outbreeding. If genes and similarity affect attraction, and biological siblings share genes and physical features, perhaps these two factors result in siblings being attracted to similar others. If so, could mutual attractions lead to competition for mates, or even mate poaching within the sibling relationship? What would influence sibling mate poaching and conversely, what might buffer against it? To explore these questions, the literature on mate poaching and sibling relationships will be reviewed.

Mate Poaching

Mate poaching refers to the act of knowingly stealing another's mate (Davies et al., 2007; Schmitt & Buss, 2001). Poaching may occur via sexual

relations with the target (i.e., infidelity) or fostering a relationship (Davies, et al., 2007; Schmitt & Buss, 2001). Schmitt and Buss (2001) were among the first to examine human mate poaching. Their sample consisted of primarily European American/White college students with an average age of 20 as well as professionals who had an average age of 41. More than 70% of their participants (and as high as 93% of men) had attempted to attract someone who was already in a relationship, and over 80% stated that someone had attempted to poach them from a partner (Schmitt & Buss, 2001). Approximately 30% of their participants, and as high as 60% of older men reported having a partner lost due to poaching (Schmitt & Buss, 2001). Moreover, 20% of men and 28% of women reported that their current relationship was initiated via poaching (Schmitt & Buss, 2001). Participants were also asked to describe the mate poaching tactics they had personally witnessed. Tactics included arranging easy sexual access, being generous, deliberately breaking up a relationship, displaying resources, derogating rivals, developing an emotional connection with a person outside the relationship, and enhancing physical appearance (Schmitt & Buss, 2001).

When committing an act of poaching, people may weigh the costs and benefits. Schmitt (2004) noted that poaching results in negative feelings such as jealousy, anger, and betrayal, but a positive outcome could include mate acquisition. Schmitt and Buss (2001) asked participants to list 10 costs and benefits that either sex may consider when deciding whether to attempt poaching. Some of the benefits included having passionate sex, having a ready

or pre-approved mate, taking pride in the conquest, seeking revenge against a rival, enjoying sexual variety, and securing a partner with physical beauty. Some of the costs included being deceptive, being unethical, experiencing family rejection, damaging one's reputation and/or social status, and feeling guilty (Schmitt & Buss, 2001).

In a separate study, participants were asked to evaluate two equally attractive individuals of the opposite-sex, but one was in a relationship and one was single (Davies et al., 2010). They had to rate the costs and benefits of choosing to attract the individual who was in a relationship. Results indicated that poaching might benefit men more than women (Davies, et al., 2010). Men reported that they would benefit from an ego boost whereas women reported being worried about shame and acquiring a bad reputation. The researchers found that the perceived costs of poaching outweighed the benefits such that participants leaned toward pursuing a single mate over poaching. However, the mean scores for the benefits of poaching were not zero (zero indicated they would not poach), suggesting that participants were at least partly motivated to poach a mate (Davies, et al., 2010).

As reviewed, there are positive and negative consequences to stealing a mate, but what about stealing a sibling's mate? If siblings have more similar mate preferences than strangers, they may become attracted to or interested in each other's partners. Do the costs and benefits apply in the same way? To our knowledge, no research has examined mate poaching among siblings. Sibling

relationships are both unique and one of the most important relationships individuals experience (Michalski & Euler, 2007; Rittenour et al., 2007). Siblings may spend a lot of time together and be especially committed to their bond. Therefore, poaching amongst siblings can be particularly risky; the consequences are potentially more detrimental than poaching from a friend, acquaintance, or stranger. Siblings also share genes, which may further complicate a poaching scenario.

Given these ideas, what would lead to poaching behaviors among siblings? In what circumstances would an individual poach or steal their sibling's mate and what would drive siblings to want to cooperate rather than compete against one another? Although few researchers have examined sibling competition and cooperation from a mating standpoint, the existing research on sibling competition and cooperation, and potential motivating factors for both poaching a sibling's mate and cooperating with a sibling for reproductive purposes will be reviewed.

Competition

Mate competition.

What does human mate competition entail? Much like animals, humans compete with one another for mates. The concept of mate competition is derived from Darwin's sexual selection theory (Buss, 1988). Darwin noted that male animals fight for access to females. Each species has its own way of demonstrating reproductive potential. Researchers have found that women too, compete for quality mates (Buss, 1988; Buss & Dedden, 1990;

Fisher & Cox, 2011). Competition between members of the same sex for mating opportunities with the opposite sex is termed intrasexual competition (Buss, 1988). The first study to examine intrasexual competition tactics had participants list 5 ways they make themselves more attractive to the opposite sex (Buss, 1988). Some of the tactics included displaying resources, flirting, wearing make-up, using humor, displaying strength, and showing off (Buss, 1988).

Buss and Dedden (1990) examined the strategies people use to derogate their mating competitors. Participants were asked to identify 5 ways they, or people they know, make members of their own sex less desirable to the opposite sex. They reported strategies that included spreading rumors about competitors, questioning their intelligence, derogating their financial resources, appearance, achievements, and/or physical strength, accusing them of promiscuity or sexual inexperience, calling them boring, and questioning their sexual orientation (Buss & Dedden, 1990).

Fisher and Cox (2011) examined two additional strategies: Mate manipulation and competitor manipulation. Mate manipulation refers to diverting the attention of a prospective mate so they are not exposed to potential competitors. They found support for the following mate manipulation tactics: Excluding rivals from activities, talking to a mate more than a rival, laughing more than usual, catering activities to what a mate enjoys, telling a mate that a rival is unavailable, homosexual, or interested in someone else, and being a better listener than a rival. Competitor manipulation primarily referred to convincing the

competition that the mate they are competing for is not worth it. Competitor manipulation behaviors included telling a friend to wear something ugly, telling a competitor that the mate is already committed, telling a rival that a mate is ugly, and directing the rival's attention to other mates (Fisher & Cox, 2011). These tactics are used to compete for mates; by extension, does sibling competition and similar mate preferences lead siblings to use these tactics for competing with one another for mates?

Sibling Competition. Among animals, it is not uncommon for siblings to compete for resources. Although organisms generally want their siblings to survive, if vital resources are threatened because of a sibling, extreme competition may arise. Sibling competition can become so intense that siblicide, or killing a sibling occurs (Sulloway, 2007). Although sibling competition in humans is generally not this extreme, humans compete for time and resources from parents. In fact, children fight with their siblings more than anyone else (Johnson, et al., 2015). Watching a parent play with a sibling can additionally elicit jealousy, distress, sadness, and anger (Kolak & Volling, 2011). These negative reactions in childhood predict sibling conflict in adulthood. Sibling rivalry is correlated with intrasexual competition (Buunk & Fisher, 2009). When individuals feel competitive with siblings, they tend to compete with other people for mates. Perhaps sibling rivalry may also be associated with intrasexual competition within the sibling relationship. What do these findings collectively

reveal regarding mate competition among siblings; do siblings pose a threat to each other's reproductive goals?

Nitsch, Faurie, and Lummaa (2013) examined the influence of sibling relationships on fitness. Participants with an older sibling had a higher rate of survival to sexual maturity than did those without an older sibling, presumably because older siblings help raise younger siblings (Nitsch, et al., 2013). However, once younger siblings reach sexual maturity, the number of older same-sex siblings is negatively correlated with the probability of reproduction in a younger sibling. No significant correlation has been found between reproductive success and the number of opposite-sex older siblings. The total number of offspring for younger siblings is also negatively correlated with the number of older same-sex siblings at sexual maturity, but the number of older opposite-sex siblings at the age of sexual maturity does not impact the total number of offspring. These effects have been found in both male and female younger siblings. Collectively, the findings suggest that same-sex siblings can facilitate survival at particular stages of life, but may negatively affect reproductive goals, potentially because of competition (Nitsch, et al., 2013).

If the presence of same-sex older siblings is negatively correlated with reproductive fitness, which supports the notion that same-sex siblings may threaten each other's reproductive success, perhaps poaching a sibling's mate or competing with siblings for mates is the evolutionary advantageous choice.

According to evolutionary psychology, two main biological goals of organisms are to survive and reproduce (Buss, 1999). If siblings are interested in similar mates, perhaps the biggest benefit to poaching their mate is the potential to reproduce with that mate. It could be beneficial for a sibling to be selfish and be the one to reproduce over their sibling.

There may be other motivations for poaching a sibling's mate. An individual might poach as revenge for something their sibling has done. If siblings do not have a close relationship, they may be more likely to poach as opposed to siblings who are close. Davies and colleagues (2010) reported that individuals experience an ego-boost from poaching (Davies et al., 2010). This outcome may be especially pronounced for siblings who compete with each other. Another reason is to save time and energy. People who are already in a relationship have made it through the selection process and are considered especially attractive for this reason (Schmitt & Buss, 2001). Single women in particular have been found to be more attracted to "taken" men over single men (Parker & Burkley, 2009). Women also evaluate men more favorably when they are with an attractive date, suggesting that women may copy mate choice (Waynforth, 2007). If an individual has trouble finding a mate and is in close proximity to or often spends time with their sibling's mate, poaching may be a likely outcome (Festinger et al., 1950).

Cooperation

Whereas some sibling relationships are competitive, cooperation may be more natural to others. David and Meyer (2008) found that same-sex siblings that

compete against one another in elite sports reported wanting mutual success for themselves and their sibling to the extent that they displayed emotional support in games and assisted their siblings with their performance. Participants did not report caring about the success of non-siblings they competed against (Davis & Meyer, 2008).

One reason individuals may steer away from poaching their sibling's mate is to keep the peace in the relationship. Family can be very important to many people (Lambert et al., 2010). Lambert and colleagues (2010) found that individuals in young adulthood listed and identified family as a major source of meaning, even over other aspects such as friends, personal achievements, happiness, and religion. More family support and closeness also predicted higher meaningfulness when other sources were controlled for (Lambert et al., 2010). Additionally, family closeness and social support contribute positively to psychological health (Campos et al., 2014).

Poaching from a sibling would likely impact trust in the relationship. Family trust is important for positive bonds and has an impact on closeness, relationship quality, and communication (Buyukcan-Tetik et al., 2015). Trust varies among family members and people do not trust their family members simply because they are family; there are things that affect whether someone trusts a family member such as proving that they are trustworthy, resisting impulses such as avoiding drugs and violence, and acting positively towards the individual

(Buyukcan-Tetik, et al., 2015). Breaking trust within the sibling and family relationship would have negative effects on those relationships.

Just as family can add to one's feeling that life is meaningful, social exclusion can affect perceptions of life as unfulfilling. Stillman and colleagues (2009) found that when compared to control groups, those who were socially excluded by a confederate in a computerized game perceived life as less meaningful (Stillman, et al., 2009). Feeling as though one's life is meaningful is linked to positive feelings such as life satisfaction, work satisfaction, overall happiness, hopefulness, physical health, and well-being. Perceived meaningfulness is also linked to lower levels of stress and depression (Mascaro & Rosen, 2005; Mascaro & Rosen, 2006).

Stealing a sibling's mate can lead to social exclusion which can be detrimental for one's sense of meaningfulness, leading to negative consequences and sense of well-being. Abiding by family rules may help people avoid negative feelings that result from social exclusion. Research supports the notion that individuals have a need to belong to a group (Baumeister & Leary, 1995; MacDonald & Leary, 2005). Ostracism, being rejected and/or excluded by strangers has negative psychological and physical effects on people (Eisenberger et al., 2003; Williams, 2007), but what about being ostracized by one's family? Zadro et al. (2008) analyzed narratives and questionnaires to investigate ostracism between loved ones. Individuals conveyed that they would be able to brush the feelings off if a stranger were ostracizing, but with a loved

one, they felt extreme heartache. Some participants indicated they would rather be physically abused than go through the emotional pain of being ignored or shut out (Zadro et al., 2008). Being ostracized by close loved ones was accompanied with negative thoughts and feelings such as worthlessness, helplessness, and thoughts of suicide. Many participants reported physical symptoms such as migraines, fatigue, and worsening pre-existing medical symptoms while experiencing ostracism (Zadro et al., 2008).

As reviewed, being ostracized by one's family can be harmful to an individual's health and well-being. Recent findings indicate that betraying one's sibling is a rule violation that may lead to these outcomes. Fitness (2005) investigated family rules including violations that would result in rejection or family exclusion. Participants were asked to identify what they believe were the worst things different family members could do to one another. One of the most reported inexcusable things a daughter could do to her parents was to act sexually promiscuous or commit a sexually taboo act. When asked about sibling offences, almost 50% of participants reported that the worst thing siblings could do to one another is betrayal whereas the second most reported rule violation was deception. Sleeping with a sibling's partner was specifically mentioned as an example of an unforgiveable betrayal. Examples of deception included telling lies and secret keeping. The consequences of violating these rules generally included exclusion from the family (Fitness, 2005).

Participants indicated that these wrongdoings are some of the worst sibling violations someone could commit because siblings are supposed to unconditionally support each other (Fitness, 2005). They conveyed that siblings should be able to depend on rather than deceive one another, implying an expectation of loyalty (Fitness, 2005). Because family is often central to a person's life and a source of meaning, one may be particularly upset if betrayal is experienced (e.g., mate poaching; Lambert et al., 2010). Recent studies suggest that the typical costs of mate poaching could be more pronounced when the culprit is a sibling. For example, in childhood there is more anger experienced between siblings than in other peer relationships (Dunn & McGuire, 1992). Additionally, when jealousy is induced in different types of relationships (i.e., siblings, dating partners, friends), it is more intense with siblings and significant others than friends (Bevan & Hale, 2006). Consequently, one might assume that jealousy would likely be more intense with siblings and partners than with strangers and acquaintances because these latter relationships are less significant. Finally, when exploring jealousy within the family, the family member most commonly reported to be the target was a sister (Aune & Comstock, 2001). Those who identified a jealousy incident reported significantly less relationship satisfaction with the target than did those who did not experience a jealousy-inducing event. Additionally, when asked to think of a time they were jealous of a family member doing something that did not involve them, 25% of participants described a situation in which they were jealous of the relationship between their

family member and another individual (Aune & Comstock, 2001). With these findings, one may expect individuals to be more hurt by a sibling wronging than something occurring within other relationship types.

With family being important contributors to feeling fulfilled, individuals are likely motivated to keep relationships with their family members peaceful. Family members react negatively toward relatives who poach mates (Schmitt & Buss, 2001). Individuals are likely deterred from poaching a sibling's mate because it would disrupt not only the sibling relationship but may cause relationship strain with other relatives. A cost associated with stealing a sibling's mate involves upsetting the family and potentially ostracizing oneself or losing family relationships all together. As Schmitt (2004) indicates, mate poaching leads to ostracism, jealousy, relationship dissolution, and even violence. These costs are likely to intensify if the poaching occurs amongst siblings. Furthermore, stealing a sibling's mate would exacerbate other costs of poaching such as stress experienced as a result of the deception, feelings of guilt, ethical concerns, status/reputation issues, self-degradation, and the destruction of relationships. These risky consequences may cause people to cooperate with their sibling and use alternative ways to promote genetic fitness.

Inclusive Fitness. Cooperating with one's sibling rather than competing for mates may seem detrimental to an individual's genetic fitness. Through cooperation, individuals may have to forego a desirable mate. However, there is a genetic benefit to sibling mate cooperation: kin selection, a component of

inclusive fitness. Through kin selection, humans enhance their own reproductive fitness (i.e., the likelihood of passing genes to succeeding generations) by helping care for their relative's offspring (Hamilton, 1964; Maynard Smith, 1964). There is an abundance of research to support the theory of inclusive fitness and the idea that humans want to help their siblings survive and reproduce.

In matters of life or death, people are willing to give more assistance to siblings who are responsible for their predicament than a stranger who is not, implying that humans choose to help sustain the lives of those with whom they share genes (Greitemeyer et al., 2003). Moreover, people are more likely to assist siblings and close relatives than they are to assist cousins or distant kin, suggesting that willingness to help varies based on the extent to which genes are shared (Jonason et al., 2007). When individuals are asked who they would prefer assist them in finding a long-term mate, they are more likely to choose kin over non-kin, and siblings over cousins and other relatives, implying that people have varying degrees of investment in spreading shared genes and helping siblings reproduce (Jonason, et al., 2007). According to these findings, helping siblings with genetic fitness may be more important than competing.

Because individuals share genes with biological siblings, it is possible to perpetuate one's own gene pool by ensuring that nieces and nephews survive and reproduce (Rushton, 1989; Rushton, et al., 1985; Thiessen & Gregg, 1980). As such, siblings have the added benefit of facilitating their survival by caregiving during times of illness and providing support to each other through stressful life

events (Horwitz, 1993). When comparing monozygotic and dizygotic twins' levels of perceived closeness with niece(s) and/or nephew(s), monozygotic twins reported significantly more perceived closeness. Aligning with inclusive fitness theory, monozygotic twins who are more genetically related to their nieces and nephews (50%) may invest in them more than dizygotic twins who are as genetically related to their nieces and nephews as non-twin siblings (25%; Segal, et al., 2007).

Recent studies have examined the role of sexual orientation and parental status influencing investment towards niece(s) and/or nephew(s) (Pollet & Dunbar, 2008; Vasey et al., 2007). Perhaps other factors influence investment such as the degree of cooperation versus competition between siblings. When there is more competition with siblings for mates, they may have reduced motivation or find it less rewarding to support a sibling in raising offspring. For those who do not compete with siblings for mates, supporting their offspring may be beneficial or easier to do.

Who is likely to poach? As reviewed, there are potential motivators for poaching and reasons one may want to cooperate. Whereas stealing a sibling's mate may be costly, the disadvantages may not affect those individuals who do not value their sibling relationship and would benefit more from competition. For example, for siblings who do not have a close relationship, stealing a sibling's mate may be more advantageous than cooperating with their sibling for mates. The same could be true for siblings who are highly competitive. As mentioned

previously, siblings who are competitive tend to be more competitive with others for mates as well (Buunk & Fisher, 2009). Whether or not one poaches a sibling's mate may be dependent on the type of relationship the individual has with their sibling and family.

According to previous research, men may be more likely than women to poach a sibling's mate. Men report more same-sex competition and more competition regarding sexual attention than women (Cashdan, 1998). Additionally, sisters report feeling closer to one another compared to brothers, and they do more activities such as talking on the phone and engaging in open and emotional conversations with each other, whereas brothers report more conflict (Spitze & Trent, 2006). As mentioned above, men engage in more poaching than women. Schmitt and Buss (2001) found that as many as 93% of men have attempted to attract someone who was already in a relationship compared to 87% of women. Men have also described more benefits of poaching such as enjoying the challenge of attracting someone and getting an ego boost from the experience (Davies, et al., 2010). Alternatively, women emphasize poaching costs as reasons for not poaching such as fears of shame and getting a bad reputation (Davies, et al., 2010). These findings indicate that male siblings may be more likely to poach their brother's mate than female siblings.

The Current Study

The purpose of the current study is to extend the literature on mate preferences and poaching among same-sex, biological, heterosexual siblings. Studying the degree of similarity in human mate preferences for siblings who share genes contributes valuable information regarding factors that influence mate selection. Further, understanding the circumstances surrounding mate poaching including conditions under which someone might poach from a close relative can help researchers better understand reproductive fitness.

Although aspects of mate selection have been studied, little is known about mate preferences among siblings. Similar mate preferences can result in intrasexual selection within siblings, which may affect reproductive goals. As reviewed, there are few studies examining this topic and no research was located that examined sibling mate preferences as proposed in the present study. The relevant research on the impact of genes toward mate preferences largely suggests that siblings would share mate preferences. The gap in knowledge regarding mate preferences among siblings reflects a need for investigation on this topic.

In addition to exploring whether mate preferences are shared, we will also examine mate competition and the potential for mate poaching among biological siblings. Siblings may be unlikely to compete for or poach a mate because family norms discourage such behavior. The advantages to be gained from inclusive fitness may also hinder competition and poaching. However, there are benefits

associated with poaching, and sibling closeness and competition may affect the likelihood of its occurrence. Our hypotheses are as follows:

Hypothesis 1. Participants' mate preferences will be more similar to the perceived mate preferences of their siblings than to the perceived mate preferences of non-siblings. The rationale for this prediction is that factors such as assortative mating and MHC-dissimilarity influence mate preferences, and biological siblings share at least 50% of their genes (Alvarez & Jaffe, 2004; Wedekind, et al., 1995). Siblings may also perceive themselves as more similar to one another than others of their same sex, even if dissimilarities exist.

Hypothesis 2. The association between perceived sibling mate preferences and sibling mate poaching will be moderated by sibling closeness. Participants who report having similar mate preferences and low closeness will be likely to poach from their sibling whereas those who report similar mate preferences and high closeness will be unlikely to poach from their sibling.

Whereas stealing a sibling's mate may be costly, the disadvantages may not be as prevalent for sibling's who do not have a strong relationship. For siblings who do not value their sibling relationship or do not have a close relationship, stealing a sibling's mate may be more advantageous than cooperating with a sibling for mates. Whether or not one poaches a sibling's mate may be dependent on the type of relationship the individual has with their sibling.

Hypothesis 3. The association between perceived sibling mate preferences and sibling mate poaching will be moderated by sibling competition. Participants who report having similar mate preferences and high competition will be likely to poach from their sibling whereas those who report similar mate preferences and low competition will be unlikely to poach from their sibling.

For siblings who are highly competitive, stealing a sibling's mate may be more advantageous than cooperating with a sibling for mates. Siblings who are competitive tend to be more competitive with others for mates (Buunk & Fisher, 2009). Additionally, some benefits of poaching include an ego boost and revenge (Davies et al., 2010). Competitive siblings may benefit from an ego boost and could use revenge as a reason to poach a sibling's mate. Those who cooperate with their sibling rather than compete may have a more harmonious relationship and have more to lose by poaching and disrupting the sibling bond.

Hypothesis 4. Sibling mate competition will be negatively associated with investment in nieces and nephews. Individuals can benefit from inclusive fitness by facilitating the biological goals of their nieces and nephews; competing with a sibling for mates would counter this purpose (Hamilton, 1964; Rushton, 1989; Rushton, et al., 1985; Thiessen & Gregg, 1980).

Hypothesis 5. Participants will report greater distress when thinking about siblings poaching mates than when thinking about poaching resulting from a stranger, acquaintance, or friend.

Because siblings have a unique relationship and may have an especially long-term bond, we expect that they will be most upset when thinking about losing a partner to their sibling (Michalski & Euler, 2007; Rittenour, et al., 2007). Moreover, family norms discourage such behavior, which may make siblings feel particularly betrayed if poaching occurs within that relationship (Fitness, 2005). Many individuals describe betrayal and deception as the worst things siblings could do to one another. Poaching a sibling's partner has been identified as an unforgiveable betrayal. Participants indicate that these wrongdoings are some of the worst violations because siblings are supposed to have each other's best interest in mind and should support rather than deceive each other (Fitness, 2005).

Recent studies suggest that the typical costs of mate poaching could be more pronounced when the culprit is a sibling. For example, in childhood there is more anger experienced between siblings than in other peer relationships (Dunn & McGuire, 1992). Additionally, when jealousy was induced in different types of relationships (i.e., siblings, dating partners, friends), jealousy was more intense with siblings and significant others than towards friends (Bevan & Hale, 2006). Consequently, one might assume that jealousy would be more intense with siblings and partners than with strangers and acquaintances as these relationships are less significant. Finally, when exploring jealousy within the family, the family member most commonly targeted is a sister (Aune & Comstock, 2001).

Hypothesis 6. Men will be more likely than women to poach a sibling's mate. Prior research found that as high as 93% of men report having attempted to attract someone who was already in a relationship compared to 87% of women (Schmitt & Buss, 2001. Men have also described particular poaching benefits such as enjoying the challenge of attracting someone and getting an ego boost as motivating factors (Davies, et al., 2010). Alternatively, women more than men, report poaching costs such as fear of being shamed, as motivators to avoid poaching (Davies, et al., 2010).

Additionally, men report more same-sex competition and more competition around sexual attention than women (Cashdan, 1998). Sisters report feeling closer to one another, talking on the phone more, and are more open to emotional conversations and exchanging advice than brothers and opposite sex siblings, while brothers report more conflict in their relationships (Spitze & Trent, 2006).

CHAPTER TWO

METHODS

Recruitment and Procedure

In order to qualify for the study, participants were required to have a same-sex biological sibling or twin within 5 years of their own age. The reason for the restricted age gap is because a wider range would likely involve siblings who are in different life stages, which may impact their mate preferences. Additionally, heterosexuality was required for participation to ensure that siblings are attracted to the same biological sex, as mate preferences across the sexes would be more complex than the scope of this project.

Participants completed an online survey hosted on Qualtrics.com. Students were recruited using a university research management system (SONA), and non-students were recruited using social media sites (e.g., Facebook, Twitter, Instagram), Reddit.com, Craigslist.org (volunteer sections) and professional listservs (i.e., Social Psychology Network). Students who participated via SONA Systems were offered two units of extra credit for their psychology courses. No incentives were offered for non-student participants. Participants completed an online questionnaire that included an informed consent form (Appendix A), questions to assess demographic characteristics, siblings' demographics, perceived mate preference similarity, mate poaching attitudes and experiences, sibling competition, sibling mate competition, sibling closeness, and niece and nephew investment (See Appendix B). Two items were

included to assess whether participants were responding carefully to the survey questions. Additionally, when responding to the questions about sibling(s), they were instructed to keep their twin (if they are a twin) or same-sex, closest aged sibling in mind. The survey took approximately 30-40 minutes to complete and consisted of the measures and questions below. All participants were treated in accordance to the Ethical Principles of Psychology and Code of Conduct (American Psychological Association, 2010).

Measures

Demographic Questionnaire

Participants were asked to identify their age, gender, sexual orientation, religion, education, employment status, and relationship status and history (e.g., "What is your longest romantic relationship?" and "Approximately how many serious romantic relationships have you had in your lifetime?"; see page 74).

Sibling Questions

Basic information was collected regarding the participants' sibling(s) including their age, twin status, and sexual orientation (see page 75). Also included was an item asking participants how much they agreed with the statement: "My sibling and I are loyal to one another." Participants responded using a 7-point Likert scale (1 = strongly disagree and 7 = strongly agree). Additional sibling questions are discussed in the measures below.

Perceived Mate Preferences

To assess perceived mate preference similarity to siblings and an average person of the same age and biological sex, a 10-item scale developed by the researchers was used. For perceived sibling mate preference similarity, participants were asked to rate how similar they believe themselves and their sibling to be on 10 different traits, when thinking about what they seek in a committed romantic partner. Responses were recorded using a 7-point Likert scale (1 = not at all similar and 7 = extremely similar). That is, if a participant chose a 7 for physical attractiveness, they believed they and their sibling sought extremely similar qualities regarding physical attractiveness in committed romantic partners. The 10 characteristics included: Physical attractiveness, creativity, friendliness, work ethic, intelligence, interesting personality, romance, sense of humor, special non-work related talents, and yearly income. These characteristics reflect those used in a mate preference allocation scale developed by Li et al. (2002). Total average scores could range from 1-7 for perceived mate preference similarity where higher scores reflected greater perceived mate preference similarity. Participants completed this measure to report how similar their perceived mate preferences were to their sibling and to indicate how similar they believe their preferences are to an average person of their age and gender (page 77). In the current study, the Cronbach's alpha for the perceived sibling mate preference scale was .86 with a Mean of 4.5 (*SD* = 1.12) and a Range of 1.0-6.7. The Cronbach's alpha for the perceived non-sibling

mate preferences scale was .88 with a Mean of 4.6 (*SD* = 1.14) and a Range of 1.0-7.0.

Mate Poaching

Sibling Mate Poaching. Questions developed by the researchers were used to assess the occurrence and frequency of mate poaching among siblings (see page 78). The instructions are adapted from an infidelity scale that has been used in prior published research (Drigotas et al., 1999) and were written in a way that sensitively introduces the items because the content is socially taboo. The items reflect the mate poaching tactics identified by Schmitt and Buss (2001).

Ten questions assessed whether the participant has engaged in poaching behaviors with a sibling's mate and 10 items assessed whether a sibling has engaged in poaching behaviors with one or more of the participant's mates. Participants responded using a 7-point Likert scale (1 = never and 7 = every time). Sample questions included: "How often have you expressed interest in a sibling's partner?" and "How often has a sibling tried to purposely look attractive in front of your partner?" Total average scores could range from 1-7 for each of the self and sibling's mate poaching behaviors with higher scores reflecting greater poaching behaviors. In the current study, the Cronbach's alpha for the sibling mate poaching scale was .92 with a Mean of 1.18 (*SD* = .29) and a Range of 1.0-2.55.

Two items were included to assess successful poaching amongst siblings. These items were derived from Schmitt and Buss (2001) and edited to pertain to

the sibling relationship. Participants recorded their responses using a 7-point Likert scale (1 = not at all successful and 7 = very successful). The questions were: “If you have ever tried to attract someone who was already in a romantic relationship with your sibling, how successful have you been?” and “If your sibling has ever tried to attract someone who was already in a romantic relationship with you, how successful have they been?” Participants were given the option to skip the questions if they did not apply.

Non-Sibling Mate Poaching. To assess non-sibling mate poaching occurrences, we used items almost identical to those used in the sibling mate poaching scale (see page 79). However, the items were altered to ask about “someone else’s partner” rather than a sibling’s partner. Similar to the sibling poaching scales, 10 items were written by the researchers that assessed whether the participant had engaged in poaching behaviors with someone else’s partner and 10 items assessed whether a sibling had done so. Participants responded using a 7-point Likert scale (1 = never and 7 = every time). Sample questions included: “How often have you tried to seduce someone’s partner?” and “How often has a sibling expressed interest in someone’s partner?” Total average scores could range from 1-7 for each of the self and sibling’s mate poaching behaviors with higher scores reflecting greater poaching behaviors. In the current study, the Cronbach’s alpha for the non-sibling mate poaching scale was .90 with a Mean of 1.76 (*SD* = .65) and a Range of 1.00-3.85.

Two items were included to assess successful poaching. These items were derived from Schmitt and Buss (2001). Participants recorded their responses using a 7-point Likert scale (1 = not at all successful and 7 = very successful). The items were: “If you have ever tried to attract someone who was already in a committed romantic relationship with someone else, how successful have you been?” and “If your sibling has ever tried to attract someone who was already in a committed romantic relationship with someone else, how successful have they been?” Participants were given the option to skip the questions if they did not apply and could also indicate if they were unsure if their sibling has ever tried to poach someone’s mate.

Poaching Attitudes. Four items asked participants how they would feel about having a partner stolen by a stranger, acquaintance, friend, and sibling (see page 80). Responses were recorded using a 7-point Likert scale (1 = content and 7 = extremely distressed). Sample questions included: “How would you feel if a stranger stole your partner?” and “How would you feel if a sibling stole your partner?” We also included an item reading “I would be most upset if _____ stole my partner” Participants selected one of the four options.

Sibling Competition

The Adult Sibling Relationship Questionnaire (ASRQ; Stocker et al., 1997) was used to assess sibling competition (see page 81). This scale measures sibling relationships in adulthood. The original scale is comprised of 81 items and includes three subscales: warmth, conflict, and rivalry (lowest alpha between

subscales = .88). For the purpose of this study, the scale was shortened to 23 items and included only items that ask about conflict and rivalry. Participants recorded their responses using a 5-point Likert scale (1 = hardly at all and 5 = very much). Sample items included: “How competitive are you with this sibling?” and “How much does this sibling try to perform better than you?”

Total average scores for perceived sibling competition could range from 1-5, with higher scores reflecting more competition. In the current study, the Cronbach’s alpha for the sibling competition scale was .94 with a Mean of 2.25 (*SD* = .80) and a Range of 1.0-4.26.

Sibling Closeness

The Lifespan Sibling Relationship Scale (LSRS; Riggio, 2000) was used to assess sibling closeness (see page 82). This scale measures feelings and experiences about the sibling relationship in childhood and adulthood (Riggio, 2000). The original scale is comprised of 48 items and includes six subscales with eight items each (alpha = .96). The subscales include: Emotions towards the sibling as a child and as an adult, beliefs about the sibling as a child and as an adult, and behavioral interactions with the sibling as a child and as an adult. The scale was shortened to include 3 items from each subscale, for a total of 18 items. The items selected were those with the highest factor loadings as reported by Riggio (2000). Participants recorded their responses using a 5-point Likert scale (1 = strongly disagree and 5 = strongly agree). Sample items included: “My sibling and I were very close when we were children” and “My sibling is one of

my best friends." Total average scores for perceived sibling closeness could range from 1-5, with higher scores reflecting greater closeness. In the current study, the Cronbach's alpha for the sibling closeness scale was .95 with a Mean of 3.47 (*SD* = 1.01) and a Range of 1.0-5.0.

Niece(s) and Nephew(s) Investment

Participants were asked whether they have any nieces or nephews, and if any of them are from a sibling of their same gender. Those who reported having nieces or nephews completed a questionnaire used by Vasey and VanderLaan (2010; see page 82). Those who reported having no nieces or nephews skipped this measure and moved on to the next section.

Niece(s) and nephew(s) investment was assessed using a 9-item subscale from the Individual Avuncular Tendencies scale used by Vasey and VanderLaan (2010) that is meant to measure tendencies towards nieces and nephews. Participants recorded their responses using a 7-point Likert scale (1 = very unwilling and 7 = very willing). Sample items included: "How willing would you be to do the following: Help my niece(s) and/or nephew(s) with their school work" and "How willing would you be to do the following: Contribute money for my niece(s) and/or nephew(s) day care." Total average scores for niece(s) and nephew(s) investment could range from 1-7, with higher scores reflecting greater willingness to invest. In the current study, the Cronbach's alpha for the niece/nephew investment scale was .89 with a Mean of 5.78 (*SD* = 1.17) and a Range of 1.2-7.0.

Sibling Mate Competition

Sibling mate competition was assessed using items written by the researchers (page 83). The assessment consisted of 5 questions. Some of these items were informed by the literature regarding strategies of mate competition (Buss, 1988; Buss & Dedden, 1990; Fisher & Cox, 2011). The items were rated on a 7-point Likert scale (1 = never and 7 = always). The questions began with the prompt “How often does this happen in your sibling relationship?” Sample items included: “My sibling and I argue or fight over someone we are both attracted to” and “I try to look more attractive to get someone both me and my sibling like.” Total average scores could range from 1-7 with higher scores reflecting greater sibling mate competition. Also included was the following open-ended question:

> If you and one or more of your siblings have shared romantic interest in a person, what was the outcome? For example, did one of you end up dating or marrying that person? How did you feel about the mutual interest in this person? Please describe in as much detail as possible.

In the current study, the Cronbach’s alpha for the sibling mate competition scale was .94 with a Mean of 1.25 (*SD* = .53) and a Range of 1.0-4.0.

CHAPTER THREE

RESULTS

Participants

Participants were eliminated from the dataset if they incorrectly responded to survey items that were included to assess whether they were carefully responding to the questions (*n* = 9). The resulting sample included 182 heterosexual individuals (35 male, 147 female) over the age of 18 years old. Their mean age was 27.14 years (*SD* = 10.09, Range = 17-66 years). They were predominantly Hispanic/Latino (52.2%) and European/white American (30.8%) with the remaining identifying as African American (4.4%), Asian American (5.5%), Middle Eastern American (1.1%), Native American (.5%) and other (5.5%). Eight participants identified as twins, with 5 identifying as an identical twin and 3 as fraternal twins.

Preliminary Analyses

The mate poaching questions were divided across several scales to examine different poaching types. As noted in the measures section, total sibling poaching included participant poaching from sibling and sibling poaching from participant, total non-sibling poaching included participant poaching from non-siblings and siblings poaching from non-siblings, and total overall poaching included participant poaching from sibling, sibling poaching from participant, participant poaching from non-siblings, and siblings poaching from non-siblings.

Each of these scales included the same range of 1-7, with 1 denoting never and 7 denoting every time regarding the frequency of poaching behaviors.

Although 102 participants reported having nieces and nephews, only 73 indicated that their niece(s) and/or nephew(s) belonged to a sibling who shared the participant's biological sex, therefore N = 73 for this item.

Data Screening

As mentioned, we included two items in the survey to examine careless responding. Participants were instructed to leave their responses blank if they were reading the items. Those who incorrectly responded to either of the items were eliminated from the sample (*n* = 9).

Scale Reliability. Reliability analyses were performed for all scales using Cronbach's alpha and item descriptives. All Cronbach alpha values were equal to .79 or above, with the exception of the sibling mate competition scale, which had an alpha of .67.

Some poaching scale items demonstrated low total item-correlations. However, it did not conceptually make sense to remove those items. Deleting them would additionally only slightly increase the alpha. It is believed that most of these items had low correlations with the other items because very few participants reported engaging in these actions with another's mate (e.g., having sex with a sibling's mate, marrying a sibling's mate). Even without deleting the items, the Cronbach's alphas were .79 and above.

The sibling mate competition scale included one item that could have been removed: “I worry that someone I like will be interested in my sibling.” This would have changed the alpha score from .667 to .704. However, the scale had only 5 items and this item had the highest mean, which could be a reason for it being slightly different than the other items. Consequently, we decided to keep this item and no items were deleted from the scales.

Missing Values Analysis. All variables were examined for missing data and had less than 5% missing values. Therefore, no further examination was needed.

Univariate Outliers. The data were inspected for univariate outliers. Frequencies were run on raw scores and z-scores. The criterion used to identify univariate outliers was a score of 3.3, in addition to examining the raw scores and their deviation from the distribution. There were no univariate outliers found for the following scales: perceived sibling mate preference similarity, perceived non-sibling mate preference similarity, total non-sibling poaching, overall poaching, the Lifetime Sibling Relationship Scale (measuring sibling closeness), and the Adult Sibling Relationship Scale (measuring sibling competition).

In examining the total sibling poaching scale, there were 5 outliers, $z = 3.66$, 3.83, 4.42, 4.69 (2), raw scores = 2.25, 2.30, 2.47, 2.55 (2). However, these scores refer to sibling poaching behaviors and deviate from the distribution because most participants reported that they do not often engage in poaching behaviors towards a sibling’s mate. The spread of the distribution may accurately capture the population as most siblings likely do not poach their sibling’s mate, but some

people do engage in this practice. Additionally, these scores are relatively low given the range of the variable (1-7). It was therefore decided to keep these scores in the data set.

For items pertaining to poaching attitudes, various outliers were identified. There were 2 outliers for the stranger item, z = -4.84 (2), raw scores = 1 (2). There were 3 outliers for the acquaintance item, z = -5.94, -3.75 (2), raw scores = 1, 3 (2). Two outliers were found for the friend item, z = -6.76 (2), raw scores = 1 (2) and 5 outliers existed for the sibling item, z = -5.97 (3), -4.94, -3.90, raw scores = 1 (3), 2, and 3. Because two of the outliers across the different levels involved the same cases, a filter was set to exclude those 2 of the cases from these analyses. Once these were removed, the stranger item had zero outliers, the acquaintance item had 1 that was not visibly far from the other scores in a histogram, the friend item had zero outliers, and the sibling item had 4 outliers that were visibly apart from the other responses on a histogram: z = -5.97 (2), -4.94, -3.90, raw scores = 1 (2), 2, and 3. After careful inspection of the 4 outliers that remained for the sibling item, we decided to remove them all in order to approximate a normal distribution.

There were 5 univariate outliers for the Sibling Mate Competition scale, z = 4.04 (2), 4.41, 5.17 (2), raw scores = 3.40 (2), 3.60, 4.00 (2). These scores deviated from the distribution. However, the scores depict sibling mate competition and removing them would remove variability for the variable. That is, as most siblings are not competitive for mates, and some may be, keeping these responses

is important in order to compare to the other responses. It was therefore decided to keep these scores in the data set.

Finally, when analyzing the niece and nephew investment scale, there was one univariate outlier, z = -3.88, raw score = 1.22. The outlier is far from the distribution and was a low score compared to the others, meaning that this person reported little investment in their niece(s) and/or nephew(s). The outlier was deleted (N = 72).

Multivariate Outliers. Multivariate outliers were examined using mahalanobis distance. There were no multivariate outliers detected. All values were within the appropriate chi square criterion value.

Tests of Normality

Skewness and Kurtosis. Histograms were examined and a z-score cutoff criterion of 3.3 was used to determine significant skewness and kurtosis. The perceived sibling mate preference variable was relatively normally distributed (kurtosis = -2.64, skewness = -0.47). Perceived non-sibling mate preference was relatively normally distributed (kurtosis = .025, skewness = -0.69). Total sibling poaching was very peaked and positively skewed (kurtosis = 22.92, skewness = 14.77). Total non-sibling poaching was positively skewed (kurtosis = .71, skewness = 5.01). Overall poaching was positively skewed (kurtosis = .958, skewness = 5.21). The stranger item for poaching attitudes was negatively skewed and peaked (kurtosis = .558, skewness = -5.74). The acquaintance item for poaching attitudes was negatively skewed and peaked (kurtosis = 6.18, skewness

= -8.44). The friend item for poaching attitudes was negatively skewed and very peaked (kurtosis = 23.45, skewness = -15.65). The sibling item for poaching attitudes was negatively skewed and very peaked (kurtosis = 39.03, skewness = -20.75). Sibling competition was slightly positively skewed (kurtosis = -1.87, skewness = 2.59). Sibling closeness was slightly flat and slightly negatively skewed (kurtosis = -1.91, skewness = -2.55). Niece and Nephew Investment was peaked and negatively skewed (kurtosis = 3.14, skewness = -4.18). Sibling mate competition was very peaked and positively skewed (kurtosis = 31.98, skewness = 17.48). The skewness and kurtosis reported in this paragraph are discussed below.

Linearity and Homoscedasticity. Linearity and homoscedasticity for moderation regression tests were examined using a scatter plot of the standardized residuals and standardized predicted scores. Using this scatter plot, linearity was observed by checking for a straight-line relationship between the axes. Homoscedasticity was evaluated by examining whether the points were evenly distributed around zero. Both linear relationships seemed weak and the scatterplots did not seem evenly distributed around the fit line. For the correlation analyses between niece/nephew investment and sibling mate competition, the relationship between the variables looked somewhat linear on the scatterplot, demonstrating a negative relationship, but exhibited a wide distribution around the fit line. The homoscedasticity assumption was evaluated by examining whether the

points were evenly distributed around the fit line and the assumption seemed to be met.

Multicollinearity. Multicollinearity was assessed for the moderator predictors of perceived sibling mate preferences, sibling competition and sibling closeness, using tolerance and VIF scores. Tolerance was greater than .8 and VIF scores were less 2 for all predictors.

Analyses

In addition to the analyses reported below for each hypothesis, basic correlations between variables were examined (Table 1). There was a significant positive correlation between sibling closeness (the Lifespan Sibling Relationship Scale or LSRS) and perceived sibling mate preferences, $r = .352$, $p < .001$. There was a significant positive correlation between total sibling poaching and sibling mate competition, $r = .467$, $p < .001$. There was a significant negative correlation between sibling competition and sibling closeness (LSRS), $r = -.308$, $p < .001$. There was a significant correlation between total sibling poaching and total non-sibling poaching, $r = .363$, $p < .001$. There was a significant correlation between sibling competition and sibling mate competition, $r = .241$, $p < .01$. Finally, there was a significant negative correlation between sibling mate competition and niece and nephew investment, $r = -.247$, $p < .05$.

Table 1

Correlations Between Measures

Variables	1	2	3	4	5	6	7
1. Perceived Sibling Mate Preferences	-						
2. Total Sibling Poaching	-.083	-					
3. Total Non-Sibling Poaching	-.147	.363**	-				
4. Lifespan Sibling Relationship Scale (sibling closeness)	.352**	-.063	-.072	-			
5. Sibling Competition	-.084	.034	.053	-.308**	-		
6. Sibling Mate Competition	.010	.467**	.216**	-.061	.241**	-	
7. Niece/Nephew Investment	-.065	-.062	.235*	.116	.067	-.247*	-

*Note. *p < .05,**p <.01*

As outlined above, the mate poaching scales did not meet statistical assumptions due to the low variability of scores (Table 2). Each poaching scale used a Likert scale with options ranging from 1-7 with 1 denoting never and 7 denoting every time for frequency of poaching behaviors. The highest mean score reported for total sibling poaching was 2.55. However, the questionnaire included an open-ended question that asks the participant to recall and explain a mutual interest or sibling poaching experience. The prompt read:

> If you and one or more of your siblings have ever shared romantic interest in a person, what was the outcome? For example, did one of you end up dating or marrying that person? How did you feel about the mutual interest in this person? Please describe in as much detail as possible.

Twenty-eight participants identified a time in which they experienced a form of mutual interest with their sibling. These responses were coded using the constant comparison method, which involved open-coding pieces of data based on emergent themes (Glaser & Strauss, 1967).

Table 2

Total Sibling Poaching Scale Means and Standard Deviations by Item

Item	*M*	*SD*
How often have you…		
had a crush on a sibling's partner?	1.32	0.80
flirted with a sibling's partner?	1.22	0.62
tried to purposely look attractive in front of a sibling's partner?	1.34	0.81
been jealous of a sibling's romantic relationship?	1.54	1.02
expressed interest in a sibling's partner?	1.08	0.43
kissed a sibling's partner?	1.02	0.24
tried to seduce a sibling's partner?	1.03	0.25
had sex with a sibling's partner?	1.02	0.22
started dating a sibling's partner?	1.02	0.24
married a sibling's partner?	1.01	0.08
How often has a sibling…		
had a crush on one of your partners?	1.37	0.87
flirted with one of your partners?	1.30	0.86
tried to purposely look attractive in front of your partner?	1.29	0.84
been jealous of your romantic relationship?	1.64	1.18
expressed interest in one of your partners?	1.25	0.84
kissed one of your partners?	1.04	0.27

tried to seduce one of your partners?	1.07	0.50
had sex with one of your partners?	1.02	0.13
started dating one of your partners?	1.03	0.26
married one of your partners?	1.01	0.07

Note. Response Options ranged from 1-7 (1 = Never, 7 = Every time)

First, responses to this question were categorized by the situation participants experienced. The emergent themes included: attracted to the same person as their sibling, liked the same person/people as their sibling, talked about competition or hard feelings with their sibling around the mutual interest(s), dated the same person as their sibling, poached/intent to poach their sibling's mate, kissed the same person as their sibling, and other. The table below lists the frequencies for each theme and provides an example for each category (Table 3). Of these, 20 participants indicated whether this was a one-time occurrence or happened more than once. Fifty percent said a similar interest in someone happened once, 40% said it happened more than once, and 10% identified this happening frequently.

Table 3

Shared Romantic Interest With Sibling Theme Frequencies and Examples

Categories by Theme and Frequency	Response Examples
Attracted to the same person (43%)	"My sister and I have been attracted to the same guy once but neither of us dated him"

Liked the same person (14%)	"When my sibling and I were younger, we liked the same person at one point, but nothing really happened between either of us."
Competing or hard feelings (14%)	"My brother would be very competitive if we were both single and went out together or with friends. He would often say things to put favor on him. I.e. 'So have you talked to Michelle lately' referring to an ex-partner of mine or even a fictitious character. The result would generally end with swearing or name-calling. This occurred while in high school and the few years after."
Dated the same person (11%)	"My younger sister had a short-term fling type relationship with my now fiancé back in their teen age years. It didn't really bother me as they have not had any sort of romantic relationship since then"
Poached/Intent to poach (7%)	"While dating in high school three different people I was in a romantic relationship with told me that my sister had tried to seduce them and attempted to end our relationship. Two of them told me they were not interested in her and asked me to confront her about the situation. However, I was too embarrassed to say anything because I did not want her to think that I felt I was prettier than her."
Kissed same person (7%)	"My sister was talking to someone as a casual relationship. One day he began to pursue me but I rejected him, reminding him he was talking to my sister. He was extremely persistent and we ended up texting and kissing, it never went any further. He told my sister about how him and I hung out and kissed. We never dated, my sister and him kept talking casually after for a while."
Other (4%)	"I think at two different times, we both experienced mild crushes, maybe infatuation, with each other's mates. I think it was just admiration for the relationship, and that we, at least I, thought the person was a good, and cool person. I am assuming my sibling felt a similar way."

Only 12 participants identified their feelings in relation to the mutual interest situation they experienced. Seven participants said they were not upset by the situation (58%), 2 said they were upset (17%), and 3 identified being very upset over the situation (25%). Of those who said they were not upset, the situations they experienced involved being attracted to the same person as their sibling (43%), liking the same person as their sibling (14%), and dating the same person (29%). Of those who said they were upset about their situation(s), 100% experienced competition with siblings for mates or hard feelings about the mutual interest. For those who indicated being very upset with the situation experienced, 33% pertained to a poaching or intent to poach experience and 67% were about competing with their sibling for mates or having hard feelings about the mutual interest. Other findings are discussed below.

Hypothesis Testing

Hypothesis 1. *Participants' mate preferences will be more similar to the perceived mate preferences of their siblings than to the perceived mate preferences of non-siblings.* A paired-samples t-test was used to compare participants' ratings of perceived mate preference similarity with siblings against their ratings of perceived mate preference similarity with non-siblings. There was no statistically significant difference between perceived similarity in sibling mate

preferences (*M* = 4.51, *SD* = 1.12) and perceived similarity in non-sibling mate preferences (*M* = 4.61, *SD* = 1.14), *t*(177)= -1.241, *p* = .216. The eta squared statistic (-0.007) indicated a very small effect size.

Hypothesis 2. *The association between perceived sibling mate preferences and sibling mate poaching will be moderated by sibling closeness. Participants who report having similar mate preferences and low closeness will be likely to poach from their sibling whereas those who report similar mate preferences and high closeness will be unlikely to poach from their sibling.*

This hypothesis was unable to be tested due to the low variability and violation of assumptions in the sibling mate poaching scale (*M* = 1.18, *SD* = .29). However, responses to the open-ended item discussed above were coded and examined for trends. Of the 28 participants who reported at least one instance of sharing a mutual interest with a sibling, 2 reported poaching attempts or intent to poach and 4 reported sibling mate competition or hard feelings resulting from the situation(s). Both perceived sibling mate preference and closeness scores were examined for these 6 individuals. Three participants had a higher perceived mate preference score than the sample mean (*M* = 4.5), two scored lower than the mean of the sample, and one participant did not complete all questions. Similarly, half of these participants had closeness scores that were higher than the mean of the sample (*M* = 3.47) and half had scores that were lower, with higher scores denoting greater sibling closeness. However, for the 2 participants who discussed poaching attempts or intent in their responses, both had low perceived

similar mate preference scores and closeness scores that were lower than the mean of the sample, with one scoring 1.1 as their closeness score.

Qualitative analyses revealed that six participants indicated their sibling relationship took precedence over a potential mate, with responses such as “I would give up the person I like” and “…when it comes to one of my siblings being romantically involved in a person that is usually my que to back off.” Four of these 6 participants reported higher average closeness scores than the mean of the sample and 2 of these had extremely high means at 5 and 4.55. Five of these participants were female and 1 was male.

Hypothesis 3. *The association between perceived sibling mate preferences and sibling mate poaching will be moderated by sibling competition. Participants who report having similar mate preferences and high competition will be likely to poach from their sibling whereas those who report similar mate preferences and low competition will be unlikely to poach from their sibling.*

This hypothesis was unable to be tested due to the low variability and violation of assumptions in the sibling mate poaching scale (M = 1.18, SD = .29). However, responses to the open-ended item discussed above were coded and examined for trends. Of the 28 participants who reported at least one instance of sharing a mutual interest with a sibling, 2 reported poaching attempts or intent to poach and 4 reported sibling mate competition or hard feelings resulting from the situation(s). Sibling competition and sibling mate competition scores were examined for these 6 participants. All 6 participants had a higher sibling

competition score than the mean of the sample (*M* = 2.25) where higher scores represented greater sibling competition. Five of the 6 participants had higher sibling mate competition scores than the mean of the sample (*M* = 1.25) with some scores of 3.4 and 3.6. Furthermore, five of the 6 participants had a lower score on the loyalty item than the mean of the sample (*M* = 5.43), in which higher scores represented more loyalty within the sibling relationship.

Of the 2 participants who reported that their sibling had attempted or intended to poach their mate, both sibling competition scores were higher than the mean of the sample. For sibling mate competition, one of these participant's scores was higher than the mean of the sample, whereas the other was lower. Both participants had low scores on the perceived sibling mate preference scale.

Additionally, when examining responses for those who reported competition with siblings for mates or experienced a poaching situation/attempt, poaching and competition were identified as either coming from the participant's sibling or as mutual competition. Only one participant admitted to giving in to the advances of a person their sibling was dating.

Hypothesis 4. *Sibling mate competition will be negatively associated with investment in nieces and nephews.*

A Pearson product-moment correlation coefficient was calculated to assess the relationship between niece and/or nephew investment and sibling mate competition. There was a small, negative correlation between the two

variables [r = -.247, p = .038], with high levels of niece and/or nephew investment associating with low levels of sibling mate competition, and vice versa.

The scatterplot revealed one outlier. This outlier was removed and the correlation was conducted again to examine whether removing the outlier affected the correlation. The correlation size changed from -.247 to -.281, and both were significant at $p < .05$. Because removing this outlier did not alter the correlation to a great extent, the original niece/nephew filter was reset.

Hypothesis 5. *Participants will report greater distress when thinking about siblings poaching mates than when thinking about poaching resulting from a stranger, acquaintance, or friend.*

A one-way repeated measures ANOVA was used to compare reactions towards different people (e.g., stranger, acquaintance, friend, and sibling) poaching participants' mates. There was a significant effect of hypothetical poacher on reactions, Wilks' Lambda = .672, $F(3,171) = 27.787$, $p < .001$, partial eta squared = .328. Mauchly's Test of Sphericity indicated that the assumption of sphericity had been violated, $\chi^2(5) = 166.841$, $p < .001$. Therefore, degrees of freedom were corrected using Greenhouse-Geisser ($\varepsilon = .628$), $F(1.88) = 57.57$, $p < .001$.

Post-hoc comparisons using the Bonferroni method were performed on all pairwise contrasts. Results indicated a significant difference in reaction to a sibling poaching the participants' mate (M = 6.89, SD = .393) versus a stranger poaching their mate (M = 6.29, SD = .923), as well as between a sibling and an

acquaintance poaching the participants' mate (*M* = 6.49, *SD* = .780) and between a sibling and a friend poaching the participants' mate (*M* = 6.80, *SD* = .512). That is, participants reported they would feel significantly more upset if a sibling poached their mate as opposed to a stranger, acquaintance, or friend.

The frequencies of responses to the item "I would be most upset if _____ stole my partner" were also examined (Table 4).

Table 4

Frequencies of Responses to "I Would Be Most Upset if Blank Stole My Partner"

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Stranger	3	1.7	1.7	1.7
	Acquaintance	1	.6	.6	2.3
	Friend	21	11.9	12.0	14.3
	Sibling	150	85.2	85.7	100
	Total	175	99.4	100	
Missing	System	1	.6		
Total		176	100		

Hypothesis 6. *Men will be more likely than women to poach a sibling's mate.*

An independent samples t-test was used to compare total sibling poaching scores (participant poaching from sibling and sibling poaching from participant)

for men and women. There was no significant difference in scores for men (M = 1.26, SD = .34) compared to women [M = 1.16, SD = .27; $t(180) = 1.87$, p = .06]. The magnitude of the difference in means was very small (η^2 = .019).

An independent samples t-test was used to compare total non-sibling poaching scores (participant poaching from non-siblings and sibling poaching from non-siblings) between men and women. There was a significant difference in the mean scores of men (M = 2.05, SD = .79) versus women [M = 1.69, SD = .59; t(43.53) = 2.49, $p < .05$]. That is, men reported poaching non-siblings significantly more than women. Levene's test indicated unequal variances (F = 9.24, p = .003) and degrees of freedom were adjusted from 180 to 43.53. The magnitude of the differences in the means was small (η^2= .033).

An independent samples t-test was conducted to compare total overall poaching scores (participant poaching from sibling, sibling poaching from participant, participant poaching from non-siblings, and siblings poaching from non-siblings) for men and women. There was a significant difference between men's mean (M = 1.64, SD = .46) and women's mean scores [M = 1.42, SD = .36; $t(44.55) = 2.54$, $p < .05$]. That is, men reported overall poaching significantly more than women. Levene's test indicated unequal variances (F = 5.59, p = .019) and degrees of freedom were adjusted from 180 to 44.55. The magnitude of the differences in the means was small (η^2 = .034).

Because of the difference in men and women in the sample (147 female and 35 men) and violations of normality, non-parametric tests were performed to

compare the above findings to the parametric results. A Mann-Whitney Test indicated that men (*Mdn* = 1.10) reported poaching within the sibling relationship (participant poaching from sibling and sibling poaching from participant) significantly more than women (*Mdn* =1.05), *U* = 1922, *p* = .016.

A Mann-Whitney Test indicated that men (*Mdn* = 1.85) reported total poaching from non-siblings (participant poaching from non-siblings and sibling poaching from non-siblings) significantly more than women (*Mdn* = 1.6), *U* = 1906.50, *p* = .017.

Finally, a Mann-Whitney Test indicated that men (*Mdn* = 1.6) reported overall poaching (participant poaching from sibling, sibling poaching from participant, participant poaching from non-siblings, and siblings poaching from non-siblings) significantly more than women (*Mdn* = 1.35), *U* = 1869.50, *p* = .012.

In the qualitative analyses, biological sex was examined for the 28 participants who reported at least one instance in which they had shared a mutual interest with a sibling. Of these 28 participants, 21 were women and 7 were men. Table 5 highlights the frequencies of these responses based on sex.

Table 5

Frequencies for Type of Mutual Interest Between Siblings Based on Sex

	Men	Women
Attracted to the same person	0	12
Liked the same person	3	1
Dated the same person	1	2
Poaching/intent to poach	0	2
Sibling mate competition/hard feelings	2	2
Kissed the same person	1	1
Other	0	1

CHAPTER FOUR

DISCUSSION

Discussion

The purpose of this study was to examine perceived mate preference similarity and poaching within sibling relationships, including an exploration of factors that may contribute to a person poaching their sibling's mate. Additional variables regarding sibling mate poaching were also examined, such as how hurt a person might feel if their partner was poached by a sibling compared to other people and the association between niece and nephew investment and sibling mate competition. Although a small number of mate poaching studies have been conducted in the past, none have examined sibling mate poaching.

Results identified a significant, positive correlation between sibling closeness and perceived sibling mate preferences. This was an unexpected and interesting finding as it signifies that siblings with a close relationship perceive their mate preferences to be similar whereas those who do not have a close relationship perceive less similarity in mate preferences with their sibling. Perhaps siblings who have divergent interests in a variety of things, including mates, are less close because of their differences. These siblings also may not know their siblings' mate preferences and may perceive them as different from their own if their sibling is perceived to be different from them. Those who are close may have the same values and interests and may therefore emphasize or

over-emphasize their similarities regarding prospective mates. Moreover, siblings who are close may talk about their interests more and therefore perceive more similarity in mate preferences as opposed to siblings who do not talk as much about their interests. Lastly, siblings who are close may be rating themselves as more similar to their sibling simply because they feel close to them.

There was a significant positive association between total sibling poaching and sibling mate competition. That is, the more competition between siblings for mates, the more poaching experienced in the sibling relationship, and vice versa. This was expected as it was hypothesized that sibling competition would moderate the association between perceived sibling mate preferences and sibling mate poaching in that siblings with high competition would be more likely to poach from their sibling. Though sibling competition (not specific to mates) and sibling poaching were not significantly correlated, sibling mate competition is more specific to competing for mates than general sibling competition. These findings imply that general competition within the sibling relationship may not correlate with sibling mate poaching, but competition does correlate with sibling mate poaching if it pertains to attracting a mate.

Lastly, there was a significant positive association between sibling mate poaching and non-sibling mate poaching. Those who have experienced more poaching within the sibling relationship also reported more poaching behaviors in their own or their sibling's relationships. This may mean that those who are more likely to poach someone else's mate may also be more likely to poach their

sibling's mate. It was speculated that the disadvantages of stealing a sibling's mate may not affect individuals who do not value their sibling relationship and who would therefore benefit more from the competition. Possibly, individuals who are more likely to poach do not value relationships or other people's feelings and are therefore more likely to poach across relationship types. The advantages to stealing another's mate, such as experiencing an ego boost and enjoying the challenge of attracting someone, may be more rewarding to some than cooperating for mates (Davies, et al., 2010). The participants who have more experience with poaching and experience these benefits may also be more open to admitting that they or their sibling has poached another's mate compared to respondents who have not experienced these benefits.

Hypothesis 1.

It was hypothesized that siblings would perceive their mate preferences to be more similar to their sibling's mate preferences than to an average person of their same gender (non-siblings). This was hypothesized based on previous research indicating that genes can play a role in mate preferences via factors such as matching (i.e., assortative mating) and odor cues. Contrary to our prediction, participants did not report their perceived mate preferences as significantly more similar to siblings than to non-siblings. This finding may be due to our study limitations in that we did not assess the participants' siblings regarding their mate preferences and therefore participants responded based on their perceptions. Siblings may in fact have more similar preferences than non-

siblings but did not want to consciously admit that they could be interested in a sibling's prospective mate because it is taboo.

Alternatively, it may be that mate preferences are not significantly more similar for siblings than non-siblings. The prediction that sibling mate preferences would be more similar was based on prior research suggesting that genes may influence mate preferences, but likely, mate preferences are influenced by numerous factors. Lykken and Tellegen (1993) compared monozygotic and dizygotic twins and concluded that mate selection may be somewhat random. Additionally, Biegler and Kennair (2016) examined sisters' interests in long-term partners and although they were extremely similar, there were differences in the relative importance of traits between the participant and their sibling (Biegler & Kennair, 2016).

Hypothesis 2.

The second hypothesis predicted that the association between perceived sibling mate preferences and sibling mate poaching would be moderated by sibling closeness. This hypothesis was not tested because mate poaching lacked variability and the variable violated assumptions in our preliminary analyses. However, responses to the following item were analyzed and coded for core themes:

> If you and one or more of your siblings have ever shared romantic interest in a person, what was the outcome? For example, did one of you end up

dating or marrying that person? How did you feel about the mutual interest in this person? Please describe in as much detail as possible.

Sibling mate preference and sibling closeness scores were examined for the 6 participants who reported sibling mate competition or poaching attempts. Though there did not seem to be trends in scores, the 2 participants who discussed poaching attempts or intent both had low perceived similar mate preference and closeness scores.

These findings are similar to the positive association exhibited between perceived similar mate preferences and closeness. It may be that these siblings do not have a close relationship due to their differences or do not perceive their mate preferences to be similar due to their low closeness. Though it is important to examine these trends across a greater number of participants, it is interesting that the only participants who reported poaching attempts or intent in their sibling relationship also reported lower closeness than the mean of the sample. One may wonder if the poaching attempts were influenced by low closeness in the relationships or whether closeness was reduced after the poaching attempts, but it is worth noting that the measure for sibling closeness assesses feelings and experiences pertaining to both adulthood and childhood.

Six participants indicated that their sibling relationship was more important than obtaining the mate or causing relationship strain over a potential mate. Four of these 6 had higher average closeness scores than the mean of the sample, with 2 scores being extremely high. This may be an indication that siblings who

are close are not willing to risk a disrupted relationship with their sibling or family members by attempting to mate poach. As reviewed, family members react negatively toward relatives who poach, mate poaching can lead to ostracism and relationship dissolution, and betraying or deceiving a sibling is considered a rule violation within the sibling relationship (Fitness, 2005; Schmitt, 2004; Schmitt & Buss, 2001).

Finally, no significant correlation was observed between sibling mate poaching and sibling closeness. These results are surprising because it was expected that siblings with similar mate preferences and less close relationships would be more likely to poach their sibling's mate whereas those without similar interests and high closeness would be less likely to poach a sibling's mate. One possible explanation for our finding is that siblings who are not close are not in close proximity of each other's partners and lack the opportunity to poach.

If sibling closeness does not affect the relationship between sibling mate preferences and sibling mate poaching as hypothesized, perhaps there are other variables that influence mate poaching within the sibling relationship. It would be interesting to explore sibling relationships with different methods and examine the influence of variables such as jealousy, envy, narcissism, and family dynamics such as favoritism among parents. If the benefits to poaching a sibling's mate are similar to those that Schmitt and Buss (2001) and Davies and colleagues (2010) found among non-siblings, there may be other underlying motivators for poaching. Those who have poached to seek revenge against a

sibling might exhibit higher scores on a jealousy or envy scale, whereas those who benefit from an ego-boost, securing a physically attractive partner, or having passionate sex might display higher scores in egocentrism and/or narcissism than those who have not poached. For those who admit to poaching or attempting to poach a sibling's mate, important information can be gained through the collection of open-ended data regarding why they attempted to poach their sibling's mate.

Hypothesis 3.

It was hypothesized that the association between perceived sibling mate preferences and sibling mate poaching would be moderated by sibling competition, with those similar in mate preferences and high in competition being likely to poach from their sibling. Similar to the previous hypothesis, this hypothesis was not tested because the mate poaching variable lacked variability and violated assumptions in our preliminary analyses. However, qualitative analyses revealed that although there did not appear to be consistent mate preference scores across the 6 participants who revealed poaching attempts or mate competition, their high sibling competition scores were consistent with our hypothesis. Those who reported a mutual attraction with their sibling that consisted of competition for that mate or poaching attempts from their sibling also reported that they had higher than average sibling competition in their relationship. This is consistent with Buunk and Fisher's finding (2009) indicating that sibling rivalry was significantly correlated with intrasexual competition.

However, the intrasexual competition in our study is within the sibling relationship.

As predicted, the siblings who experienced poaching or mate competition within their sibling relationship exhibited a competitive relationship without as much loyalty and thus may have less to lose when risking the relationship by attempting to poach a mate. Similarly, these individuals may get more benefits from poaching a sibling's mate. Individuals who have a competitive relationship with their sibling may gain more from an ego boost, use the poaching attempts as revenge, or find the mate to be more attractive because their sibling has already vetted and chosen them (Davies et al., 2010; Parker & Burkley, 2009; Schmitt & Buss, 2001).

Interestingly, the 2 participants who reported poaching attempts reported low similarity in sibling mate preferences. It is important to recall that these were perceived scores and participants may not view their preferences as similar. However, if these scores are accurately representing sibling mate preference similarity as hoped, these findings may imply that these participants are poaching their sibling's mate for reasons other than genuine interest in the mate. Their motivation may pertain to the benefits received (e.g., ego boost, revenge). As mentioned above, it would be interesting to examine whether certain variables (e.g., jealousy, narcissism) are correlated with sibling mate poaching.

One final interesting finding emerging from the open-ended responses was that no participants identified themselves as the poacher or indicated that

they are the one who competes with a sibling for mates. The only participant who admitted to these behaviors indicated that the person their sibling was seeing was extremely persistent in pursuing her before she gave in and kissed him. Could it be that none of the 182 participants have been the one to compete with a sibling or pursue their mate, or are participants withholding information that may make themselves look or feel bad? Though the low variability found in the sibling mate poaching scale implies that mate poaching within the sibling relationship may be a rare occurrence due to potential costs, it would be worth including a measure of social desirable response bias in future work to at least partly answer this question.

Hypothesis 4.

As predicted, sibling mate competition was negatively associated with participants' investment in their niece(s) and/or nephew(s). The more competition participants reported with their siblings for mates, the less investment in nieces and nephews they espoused. These results suggest that people who are more likely to help and cooperate with siblings are also helping them to raise their offspring whereas people who are likely to compete with their siblings for mates are not investing as much time and resources in their niece(s) and/or nephew(s). As reviewed, helping a sibling care for their children can perpetuate one's own genes (Hamilton, 1964; Rushton, 1989).

These results illuminate dynamics of competition for mates among siblings, as well as who is likely to poach. If an individual chooses not to compete

with their sibling for mates, they may be trying to ensure their genes survive through kin selection. Those who decide to compete with their sibling for mates may be less likely to help their sibling raise offspring and may not have the same benefits from inclusive fitness because they are more focused on their own reproductive goals.

Hypothesis 5.

As hypothesized, participants reported greater distress when thinking about siblings poaching one of their mates compared to poaching by a stranger, acquaintance, or friend. It is presumed that participants reported feeling more upset from sibling mate poaching because of their unique relationship and long-term bond, especially when compared to an acquaintance or stranger (Michalski & Euler, 2007; Rittenour, et al., 2007). Moreover, sibling mate poaching violates sibling expectations, which could cause individuals to feel particularly betrayed (Fitness, 2005). As previously stated, betraying and deceiving a sibling are considered some of the worst offences in the sibling relationship and with the importance of family for most people, this betrayal can be more devastating and hurtful compared to other relationships (Campos, et al., 2014; Fitness, 2005; Lambert et al., 2010).

When asked to identify which person would cause the most upset from poaching, 150 people chose sibling (85.2%) and 21 chose friend whereas 3 indicated a stranger and 1 chose an acquaintance. Friend was chosen much more often than stranger or acquaintance. Again, these results support the idea

that although having a partner stolen away may be hurtful no matter who is doing the poaching, a betrayal from someone close to the individual is more hurtful than by someone without close ties (Campos, et al., 2014; Fitness, 2005; Lambert et al., 2010). The act of having a close contact engage in mate poaching could also make it more embarrassing for the targeted person. An interesting avenue to explore in future work would be to ask participants to describe the feelings and hurt experienced in each relationship context. This might help elucidate how each type of relationship affects one's feelings about this unique form of betrayal.

Hypothesis 6.

Lastly, it was predicted that men would be more likely to poach a sibling's mate than women. This hypothesis was not supported. However, because the prediction was based on prior research in which men report poaching more than women, non-sibling poaching and overall poaching were also examined for sex differences (Schmitt & Buss, 2001; Schmitt 2004). Men reported poaching non-sibling's mates significantly more than women. This included both participants and their siblings poaching from others. Men also reported poaching other people's mates significantly more than women overall, which included poaching from siblings and non-siblings combined. These results are consistent with the findings of other researchers (Schmitt & Buss, 2001).

Why did we not find a sex difference regarding sibling mate poaching? Perhaps men do not poach their sibling's mates more than women. It does seem

odd that men poach from others more than women in other contexts, but not when it comes to siblings. However, in examining responses to a survey question about loyalty (i.e., How likely are you to agree with this statement? My sibling and I are loyal to one another) men and women had extremely similar means. Perhaps because poaching a sibling's mate is considered a betrayal that goes against family norms, both sexes commit the act very rarely. Additionally, poaching a sibling's mate could compromise one's genetic fitness by interfering with their sibling's likelihood of reproducing and spreading shared genes or keeping potential children from being raised by both parents. Conversely, poaching from someone who is not a relative would not have the same consequences.

Because of the difference in number of men and women in this study (147 women and 35 men) and violations of normality, non-parametric tests were performed and compared with the parametric results. The poaching scales had high skewness and kurtosis and some outliers. Unlike the parametric results, the results of the non-parametric tests demonstrated support for sex differences in mate poaching, as there was a significant difference in reported sibling poaching between men and women. With the nonparametric test, men reported sibling poaching within the sibling relationship significantly more than women. Similar to the parametric test results, men also reported significantly more poaching from non-siblings and more overall poaching, which included both sibling and non-sibling poaching.

Given these conflicting results, further research should be done to compare the frequency of men and women poaching a sibling's mate. If men poach their sibling's mate more often than women, it may pertain to differences in their friendships and sibling relationships. For example, women tend to be closer and more involved with friends and siblings compared to men (Pulakos, 1989). Moreover, compared to brothers, sisters feel closer to one another, are more open to emotional conversations, and exchange advice, while brothers report more conflict (Spitze & Trent, 2006). Men report more same-sex competition and more competition regarding sexual attention than women (Cashdan, 1998). One possible explanation for why men engage in these competitive behaviors more than women could be that they risk paternity certainty, whereas women do not face the same challenge (Cashdan, 1998; Trivers, 1972). Furthermore, as mentioned above, men may benefit more than women from poaching. In a study identifying the costs and benefits of poaching, men indicated they would enjoy the ego boost whereas women indicated they would be worried about the shame and negative reputation that comes with stealing someone's mate (Davies, et al., 2010).

Limitations and Directions for Future Research

As with any research, it is important to highlight the limitations of this study. First, there were fewer men than women in the sample. However, some results were replicated as more men responded to the survey. Specifically, the tests on sex differences were replicated and the direction of effects and

significance levels were consistent. Our predominant recruitment method was through CSUSB's psychology department participant pool, which contains significantly more women than men and is comparable to many other study samples who rely on university participant pools ("Degrees in Psychology," 2018).

Another limitation was that data were only collected from one, not both siblings. It would have been difficult to reach and incentivize sibling participation, particularly if poaching had occurred and we were relying on the first sibling to recruit the other for participation. Therefore, students completed the survey themselves and reported on their sibling's mate preferences and poaching experiences. This method is prone to bias and participants may not be able to accurately describe the overlap between themselves and their sibling. The information would have likely been different if gathered from both siblings for variables such as mate preferences and poaching experiences, sibling closeness, and sibling mate competition. Sampling both siblings was difficult to achieve given limited resources.

Possibly the biggest study limitation pertained to low variability for the variables of mate poaching and sibling mate competition that were required for performing the planned statistical tests. These variables did not meet normality assumptions, included some outliers, and exhibited a low range of scores. If sibling mate poaching is indeed a rare occurrence, as this study suggests, recruiting from a greater number of participants may not rectify the problem.

Possibly, a next step in this line of work would be to collect open-ended and qualitative data about whether siblings share mate preferences, including reasons as to why or why not, if they know of anyone who has poached a sibling's mate, and the details of these situations. This may provide a clearer understanding of both the prevalence of mate preference similarity and poaching attitudes and behaviors among siblings. It would also be interesting to examine these rates in a different environment. Perhaps our sample demonstrated low variability in sibling mate poaching due to the ease of accessing prospective partners via the internet and interactions with others that are common in Western contexts. With many mates to choose from, poaching a sibling's mate may be a more costly choice compared to less populous environments in which people have few options and perhaps reduced stigma regarding the act.

As mentioned previously, only one person out of 182 participants admitted to betraying a sibling and stated that her sibling's partner was extremely persistent in pursuing her before she gave in and kissed him. Additionally, no participants identified themselves as the one who competed for a sibling's mate. Could it be that some experiences were not reported? Possibly, individuals are not willing to admit they are interested in the same prospective partner as their sibling or that they have betrayed them by poaching their mate because this behavior is socially unacceptable (Fitness, 2005). Responses may have been influenced by feelings of embarrassment, shame, and/or a hesitation toward sharing details that could make them look or feel bad. Because some of these topics are taboo and

individuals may feel judged if they answer honestly, it may be beneficial to include a social desirability scale in future research, if it is not feasible to obtain responses from both siblings.

Moreover, it is possible that the ethnic makeup of our sample limited the extent to which people were willing to admit to mate poaching and/or poaching a sibling's mate. Our study included 52.2% of Hispanics/Latinos and admitting to these behaviors may not be accepted in Latin cultures that emphasize family values and respect (Vázquez García, et al., 2000). Mate poaching rates could also be lower among Latin individuals due to collective norms. We recommend exploring this topic with additional ethnic groups. The research by Schmitt and Buss (2001), which identified higher rates of poaching, was conducted with predominantly European/White participants.

Lastly, it is recommended that future researchers further examine sibling mate preference similarity among identical twins and compare those results to non-siblings. Recent research has examined twin's mate choices. However, these studies examined an individual's preference for someone similar to themselves rather than comparing sibling mate preferences to the mate preferences of others (e.g., Lykken & Tellegen, 1993; Rushton & Bons, 2005; Verweij, Burri, et al., 2014; Zietsch et al., 2012).

Conclusion

This study examined dynamics related to sibling sexual selection, including mate preferences, poaching, and investment in kin. There is a dearth of research examining these topics among siblings. This line of work can lead to a greater understanding of the factors that contribute to an individual's desire to mate with another and help researchers understand more about those who succeed in attracting a mate, and potentially spreading their genes through reproduction. Our research showed no statistically significant difference in perceived similar mate preferences between siblings and non-siblings, though future research should collect data from both siblings, if possible. Although there was not enough variability to test our hypotheses regarding sibling mate poaching, we were able to observe trends and examine sibling mate poaching experiences through qualitative analyses. Our research provided a good starting point for examining mate preferences and poaching among siblings and demonstrated that individuals would be most upset over a sibling poaching their mate, compared to other relationships. Finally, our research showed that sibling mate poaching may be a rare occurrence or one that participants do not feel comfortable disclosing.

APPENDIX A

INFORMED CONSENT

INFORMED CONSENT

The study in which you are being asked to participate is designed to investigate mate preferences among siblings. This study is being conducted by Dr. Kelly Campbell, Associate Professor at the California State University, San Bernardino (CSUSB) and Elisha Barron, graduate student at California State University, San Bernardino. This study has been approved by the Institutional Review Board, California State University, San Bernardino and a copy of the approval stamp should appear somewhere on this form.

PURPOSE: This study is designed to assess mate preferences amongst siblings.

DESCRIPTION: In this study you will be asked to complete survey questions about yourself and your siblings. You will also be asked to complete a series of demographic questions such as your gender and age.

PARTICIPATION: Your participation in this study is entirely voluntary. You are free to withdraw your participation or choose to not answer a question at any time during the study without penalty. You are also free to remove any data at any time.

CONFIDENTIALITY: All of your responses will remain anonymous. Presentation of the study results will be reported in a group format only and your name will not be identified in any publication.

DURATION: The survey should take no more than 30 minutes to complete and is worth 1 unit of extra credit in a Psychology class of your choice, at your instructor's discretion.

RISKS: This study entails no risks beyond those routinely encountered in daily life.

BENEFITS: This study does not provide any direct benefits to individual participants.

CONTACT: If you have any questions concerning this survey, the results, or your participation in this research please feel free to contact Dr. Kelly Campbell at (909) 537-7687, Kelly@csusb.edu, or Elisha Barron at barre320@coyote.csusb.edu.

CONFIRMATION STATEMENT

I understand that I must be 18 years of age or older to participate in your study, have read and understand the consent document and agree to participate in your study.

SIGNATURE:

ONLINE AGREEMENT BY SELECTING THE 'I AGREE' OPTION ON THE WEBPAGE INDICATES CONSENT TO PARTICIPATE IN THE STUDY.

APPENDIX B

SURVEY

DEMOGRAPHIC AND RELATIONSHIP HISTORY QUESTIONS

1. What is your sex? Man Woman

2. What is your age? _____

3. Please indicate your ethnic background.
   - African American
   - Asian American
   - European/White American
   - Hispanic or Latin American
   - Middle Eastern American
   - Native American
   - Other: _____

4. What is your sexual orientation (Select one)

Heterosexual	Lesbian	Asexual
Gay	Bisexual	other

5. Do you consider yourself religious?

Not at all Somewhat religious Very religious Extremely religious

6. Do you have any children? NO or YES

7. What was the last grade in school you completed?
   - None or early kindergarten
   - Grades 1-8
   - Grade 12 or GED
   - College 1-3 years
   - College Graduate
   - Master's Graduate
   - Ph.D. Graduate

8. What is your primary employment status?
   - Unemployed
   - Student and not working
   - Student and working
   - Working part-time
   - Working full time

9. What is your current relationship status?

Not currently dating or involved with anyone
Casually Dating
Seriously or Exclusively Involved
Engaged
Cohabitating (living together)
Married
Divorced
Widowed
Other (please specify):

10. What is your longest romantic relationship? _____ months _____ years

I have never been in a romantic relationship

11. In general, how promiscuous are you?

1	2	3	4	5	6	7
not at all promiscuous			somewhat promiscuous			extremely promiscuous

12. Approximately how many serious romantic relationships have you had in your lifetime? ____

13. Approximately how many non-serious romantic relationships (e.g., short-term or "flings") have you had in your lifetime? _____

SIBLING RELATIONSHIP QUESTIONS

1. How many biological siblings do you have? _____brothers ____ sisters

2. Do you have a biological sibling that is the same biological sex as you? NO or YES

3. Please think of a sibling who is your same gender, and then closest to you in age. How old is this sibling?

4. How many years apart are you (or difference in age)? Years ___ Months ___

5. What is your sibling's sexual orientation?

Heterosexual Lesbian Asexual
Gay Bisexual other

6. What is your sibling's current relationship status?

Not currently dating or involved with anyone
Casually Dating

Seriously or Exclusively Involved
Engaged
Cohabitating (living together)
Married
Divorced
Widowed
Other (please specify):

7. Which child are you in your family?
oldest child a middle child youngest child

8. Are you a twin?
NO or YES

8b. If yes, are you a
fraternal twin
identical twin

9. When you are seriously involved in a romantic relationship (e.g., seriously dating, cohabiting, married), do you find that the relationship with your sibling is more or less close than when you are not seriously involved with someone?

1	2	3	4	5	6	7
less close			the same/no difference			more close

10. Over the course of your life, do you feel that you and your sibling have grown more or less likely to share romantic partner interests?

1	2	3	4	5	6	7
less likely			neutral/mixed			more likely

11. In general, how promiscuous is your sibling?

1	2	3	4	5	6	7
not at all promiscuous			somewhat promiscuous			extremely promiscuous

12. How likely are you to agree with this statement? - My sibling and I are loyal to one another.

1	2	3	4	5	6	7
strongly disagree			neutral/mixed			strongly agree

PERCEIVED MATE PREFERENCE SIMILARITY:

If you are a twin, please keep your twin in mind when answering the following questions. If you are not a twin, please refer to the sibling who is closest to you in gender and then age. Think about how similar or different you are when it comes to choosing a committed romantic partner.
Please rate how similar you and your sibling are on the following traits when thinking about **what you look for** in a committed romantic partner. For example, if you choose a 7 for physical attractiveness, this means that you and your sibling look for extremely similar qualities regarding physical attractiveness in committed romantic partners.

1	2	3	4	5	6	7
Not at all similar			moderately similar			extremely similar

Physical Attractiveness _____
Creativity _____
Friendliness _____
Work Ethic _____
Intelligence _____
Interesting Personality _____
Romance _____
Sense of Humor _____
Special non-work related talents _____
Yearly Income _____

Please think about an average person of your age and gender. Think about how similar or different you are when it comes to choosing a committed romantic partner.
Please rate how similar you and the average person of your age and gender are on the following traits when thinking about **what you look for** in a committed romantic partner. For example, if you choose a 7 for physical attractiveness, this means that you and the average person of your age and gender look for extremely similar qualities regarding physical attractiveness in committed romantic partners.

1	2	3	4	5	6	7
Not at all similar			moderately similar			extremely similar

Physical Attractiveness _____
Creativity _____
Friendliness _____
Work Ethic _____
Intelligence _____

Interesting Personality _____
Romance _____
Sense of Humor _____
Special non-work related talents _____
Yearly Income _____

Citation: Adapted from: Li, N. P., Bailey, J. M., Kenrick, D. T., & Linsenmeier, J. A. W. (2002). The necessities and luxuries of mate preferences: Testing the tradeoffs. *Journal of Personality and Social Psychology, 82*(6), 947–955. https://doi.org/10.1037/0022-3514.82.6.947

MATE POACHING WITHIN SIBLINGS

Attraction is something we often cannot control. Part of being human is being aware of and attracted to people. Sometimes that attraction is mutual and sometimes it is not. When it is mutual it often leads to certain flirting behaviors. I want you to think of any instances where you were attracted to one of your sibling's committed romantic partners. Please respond to the following questions **with that person or those people in mind.**

Never Rarely Occasionally Sometimes Frequently Usually Every time

How often have you…

1. Had a crush on a sibling's partner
2. Flirted with a sibling's partner
3. Tried to purposely look attractive in front of a sibling's partner
4. Been jealous of a sibling's romantic relationship
5. Expressed interest in a sibling's partner
6. Kissed a sibling's partner
7. Tried to seduce a sibling's partner
8. Had sex with a sibling's partner
9. Started dating a sibling's partner
10. Married a sibling's partner

For the following questions, please think of any instances where your sibling was attracted to one of your committed romantic partners.

How often has a sibling…

1. Had a crush on one of your partners

2. Flirted with one of your partners
3. Tried to purposely look attractive in front of your partner
4. Been jealous of your romantic relationship
5. Expressed interest in one of your partners
6. Kissed one of your partners
7. Tried to seduce one of your partners
8. Had sex with one of your partners
9. Started dating one of your partners
10. Married one of your partners

If you have ever tried to attract someone who was already in a committed romantic relationship with your sibling, how successful have you been (if you have <u>never</u> tried, skip this question)?

1	2	3	4	5	6	7
not at all successful			moderately successful			very successful

If your sibling has ever tried to attract someone who was already in a committed romantic relationship with you, how successful have they been (if they have <u>never</u> tried, skip this question)?

1	2	3	4	5	6	7
not at all successful			moderately successful			very successful

Citation: Developed by Elisha Barron and Kelly Campbell. Instructions adapted from Drigotas, S. M., Safstrom, C. A., & Gentilia, T. (1999). An investment model prediction of dating infidelity. *Journal of Personality and Social Psychology, 77(3)*, 509-524. Items reflect tactics identified in Schmitt, D. P., & Buss, D. M. (2001). Human mate poaching: tactics and tempations for infiltrating existing mateships. *Journal of Personality and Social Psychology*.

GENERAL (NON-SIBLING) MATE POACHING ITEMS

Attraction is something we often cannot control. Part of being human is being aware of and attracted to people. Sometimes that attraction is mutual and sometimes it is not. When it is mutual it often leads to certain flirting behaviors. I want you to think of any instances where you were attracted to someone who was already in a committed romantic relationship. Please respond to the following questions **<u>with that person or those people in mind.</u>**

Never Rarely Occasionally Sometimes Frequently Usually Every time

How often have you…

1. Had a crush on a someone else's partner
2. Flirted with someone's partner
3. Tried to purposely look attractive in front of someone's partner
4. Been jealous of someone's romantic relationship
5. Expressed interest in someone's partner
6. Kissed someone's partner
7. Tried to seduce someone's partner
8. Had sex with someone's partner
9. Started dating someone's partner
10. Married someone's partner

For the following questions, please think of any instances where your sibling was attracted to someone who was already in a committed romantic relationship.

How often has a sibling…

1. Had a crush on a someone else's partner
2. Flirted with someone's partner
3. Tried to purposely look attractive in front of someone's partner
4. Been jealous of someone's romantic relationship
5. Expressed interest in someone's partner
6. Kissed someone's partner
7. Tried to seduce someone's partner
8. Had sex with someone's partner
9. Started dating someone's partner
10. Married someone's partner

If you have ever tried to attract someone who was already in a committed romantic relationship with someone else, how successful have you been (if you have <u>never</u> tried, skip this question)?

1	2	3	4	5	6	7
not at all successful			moderately successful			very successful

If your sibling has ever tried to attract someone who was already in a committed romantic relationship with someone else, how successful have they been (if they have <u>never</u> tried, skip this question)?

1	2	3	4	5	6	7
not at all successful			moderately successful			very successful

___ I don't know if my sibling has ever tried to do this

Citation: Developed by Elisha Barron and Kelly Campbell. Instructions adapted from Drigotas, S. M., Safstrom, C. A., & Gentilia, T. (1999). An investment model prediction of dating infidelity. *Journal of Personality and Social Psychology, 77(3),* 509-524. Items reflect tactics identified in Schmitt, D. P., & Buss, D. M. (2001). Human mate poaching: tactics and tempations for infiltrating existing mateships. *Journal of Personality and Social Psychology*.

POACHING ATTITUDES

For the questions below, please imagine you are in a **<u>long-term committed relationship</u>**. Please use the following scale to answer these questions:

1	2	3	4	5	6	7
content			neither happy nor unhappy			extremely distressed

How would you feel if a stranger stole your partner?
How would you feel if an acquaintance stole your partner?
How would you feel if a friend stole your partner?
How would you feel if a sibling stole your partner?

I would be most upset if _____ stole my partner

A stranger
An acquaintance
A friend
My sibling

Citation: Developed by Elisha Barron and Kelly Campbell

SIBLING COMPETITION

If you are a twin, please keep your twin in mind when answering these questions. If you are not a twin, please refer to the sibling who is closest to you in gender and then age. Please rate how characteristic each item is of you and your sibling.

1 2 3 4 5
Hardly at all Very Much

1. How much do you and this sibling argue with each other?
2. How much do you irritate this sibling?
3. How much does this sibling irritate you?
4. How competitive are you with this sibling?
5. How competitive is this sibling with you?
6. How much do you dominate this sibling?
7. How much does this sibling dominate you?
8. How often does this sibling criticize you?
9. How often do you criticize this sibling?
10. How often does this sibling do things to make you mad?
11. How often do you do things to make your sibling mad?
12. How much does this sibling feel jealous of you?
13. How much do you feel jealous of this sibling?
14. How much is this sibling bossy with you?
15. How much are you bossy with this sibling?
16. How much does this sibling disagree with you about things?
17. How much do you disagree with this sibling about things?
18. How much does this sibling put you down?
19. How much do you put this sibling down?
20. How much does this sibling try to perform better than you?
21. How much do you try to perform better than this sibling?
22. How much does this sibling act in superior ways to you?
23. How much do you act in superior ways to this sibling?

Citation: Stocker, C. M., Furman, W., & Lanthier, R. P. (1997). Sibling relationships in early adulthood. *Journal Of Family Psychology*, *11*(2), 210-221. https://doi.org/10.1037/0893-3200.11.2.210

THE LIFESPAN SIBLING RELATIONSHIP SCALE

Please continue to respond with the sibling in mind who is most similar to you in terms of gender and then age.

How likely are you to agree or disagree with the following statements?
1 2 3 4 5

strongly disagree | neutral/mixed | strongly agree

1. My sibling makes me happy
2. I enjoy my relationship with my sibling
3. My sibling and I have a lot of fun together
4. My sibling and I share secrets
5. My sibling and I do a lot of things together
6. My sibling and I 'hangout' together
7. My sibling and I are not very close
8. My sibling is one of my best friends
9. I know that I am one of my sibling's best friends
10. My sibling made me miserable when we were children
11. I remember feeling very close to my sibling when we were children
12. I remember having a lot of fun with my sibling when we were children
13. My sibling and I often helped each other as children
14. My sibling and I often played together as children
15. I talked to my sibling about my problems when we were children
16. My sibling and I were 'buddies' as children
17. My sibling and I were very close when we were children
18. My sibling and I had a lot in common as children

Citation: Riggio, H. R. (2000). Measuring attitudes toward adult sibling relationships: The Lifespan Sibling Relationship Scale. *Journal Of Social & Personal Relationships*, *17*(6), 707. https://doi.org/10.1177/0265407500176001

NEICE AND NEPHEW INVESTMENT

1. Do you have any nieces or nephews? NO YES
   If no, skip to next section

2. Are any of your nieces or nephews from a sibling who is the same gender as you? NO YES

3. How close are you to your niece(s) and/or nephew(s)?
Not at all close Slightly close Somewhat close Very close Extremely close

4. In general, how would you rate the quality of time spent with your niece(s) and/or nephew(s)?
Poor Fair Good Very good Excellent

How willing would you be to do the following?

1 2 3 4 5 6 7

very unwilling very willing

Babysit my niece(s) and/or nephew(s) for an evening
Babysit my niece(s) and/or nephew(s) on a regular basis
Take care of my niece(s) and/or nephew(s) for a week while their parents are away
Buy toys for my niece(s) and/or nephew(s)
Help my niece(s) and/or nephew(s) with their school work
Help to expose my niece(s) or nephew(s) to art and music
Contribute money for my niece(s) and/or nephew(s) day care
Contribute money for my niece(s) and/or nephew(s) medical expenses
Contribute money for my niece(s) and/or nephew(s) education

Citation: Vasey, P. L., & VanderLaan, D. P. (2010). An adaptive cognitive dissociation between willingness to help kin and nonkin in Samoan Fa'afafine. *Psychological Science (Sage Publications Inc.), 21*(2), 292- 297. https://doi.org/10.1177/0956797609359623

SIBLING MATE COMPETITION SCALE

If you are a twin, please keep your twin in mind when answering these questions. If you are not a twin, please refer to the sibling who is closest to you in gender and then age.

How often does this happen in your sibling relationship?

Never Rarely Occasionally Sometimes Frequently Usually Every time

1. My sibling and I argue or fight over someone we are both attracted to
2. I try to look more attractive to get someone both me and my sibling like
3. I worry that someone I like will be interested in my sibling
4. I talk badly about my sibling to someone we both like
5. I try to be better than my sibling to win the affection of a person we both like

Citation: Developed by Elisha Barron and Kelly Campbell

MATE SHARING BELIEFS SCALE

Please rate how much you personally agree or disagree with the following statements

Strongly disagree • Disagree • Somewhat disagree • Neither agree or disagree • Somewhat agree • Agree • Strongly agree

1. It is wrong to date someone your sibling has dated
2. According to cultural norms, siblings should not date the same person

3. My family would judge me if my sibling and I dated the same person (at different times)
4. I do not mind if my sibling and I are attracted to the same person
5. My family would judge me if I was attracted to someone my sibling was dating
6. I would feel disappointed in myself if I dated someone my sibling has dated
7. Society believes that siblings should not be attracted to the same person

Citation: Developed by Elisha Barron and Kelly Campbell

OPEN-ENDED QUESTIONS:

If you and one or more of your siblings have ever shared romantic interest in a person, what was the outcome? For example, did one of you end up dating or marrying that person? How did you feel about the mutual interest in this person? Please describe in as much detail as possible.

Please describe the extent to which you and your sibling have similar or dissimilar taste in romantic partners.

APPENDIX C

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

Human Subjects Review Board
Department of Psychology
California State University,
San Bernardino

PI: Campbell & Barron

From: Michael R. Lewin

Project Title: Biological Siblings: Can You Trust Them With Your Mate?
SONA TITLE: Mate Interests Among Siblings

Project ID: H-16SU-03

Date: 8/2/16

Disposition: Administrative Review

Your project H-16SU-03 has been approved. You are approved to sample 250 participants from SONA. Participants recruited through social media outlets are not counted toward the SONA limit of 250. This approval is valid until 8/2/17.

Good luck with your research!

Michael R. Lewin, Co-Chair
Psychology IRB Sub-Committee

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