

Aggressive mating strategies in young adolescent girls

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ABSTRACT

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Adolescence is the time when humans begin utilizing mating strategies (e.g., flirting, fighting or rumor spreading about competitors) to attract and keep mates. Consistent empirical evidence shows that some adolescent boys are on a developmental pathway in which they utilize aggression and risky behaviors in their mating strategies, but there is little research on adolescent girls' use of aggression and risk-taking in mating. This study hypothesized that ethnically diverse, young adolescent girls nominated consistently as flirts were also more likely to be nominated as aggressive and report higher levels of risk taking behaviors (e.g., drug use, delinquency) than girls not nominated as flirts. This study assessed mating effort via a new approach: peer-report of flirting behavior, which is dissimilar to previous studies that asked participants to report on their mating effort behaviors or report on peers who were not participants in the study. It is proposed that flirting behavior will increase yearly from 6th to 8th grade, coinciding with the start of puberty. It is also predicted that consistent flirts will endorse dating more frequently, as mating behavior and mate success are strongly linked in the literature.

This study also investigated the relationship between attractiveness, which is an aspect of mate value, and mating effort. Researchers have found that mating effort and mate value increase one's mating success and they are positively correlated. Also, this study analyzed the relationship between adolescents' familial adversity and their mating effort as previous research found that familial adversity has a causal influence on teenage sexual risk taking behaviors, earlier start of puberty, and earlier sexual debut.

Sixth graders in two large middle schools in a low income, ethnically diverse, northeastern school district were followed for three years for a larger longitudinal study. This study uses data from a subsample of 190 adolescent girls with complete data for 7th and 8th grades. Measures were administered in language arts or social studies classes during the fall of each year. Measures included a peer-report of flirtatiousness and aggressive behavior via the Revised Class Play (Masten, Morrison, & Pelligrini, 1985), self-report of dating frequency, and self-report of risk taking behaviors including substance and alcohol use (Winters, 1992) and delinquency (Elliot, Huizinga, & Ageton, 1985). Attractiveness was assessed via peer-report ratings of yearbook photos and self-reports of body image and appearance satisfaction (Cash, 2000). Adverse familial background was measured as self-report of psychological aggression from parents (Straus, Hamby, Finkelhor, Moore, & Runyan, 1998) and living arrangements in 6th grade.

Multivariate analysis of variance was used to compare girls nominated consistently as flirterers in both 7th and 8th grade with girls not nominated in either grade on dependent variables. Flirting girls had significantly higher peer nominated overt ($\eta_p^2 = .224$) and relational aggression ($\eta_p^2 = .246$) and higher delinquency ($\eta_p^2 = .079$) and problems with drug use ($\eta_p^2 = .120$) than Nonflirterers. They also were significantly more likely to endorse dating more frequently ($\eta_p^2 = .176$), demonstrated that their flirting behaviors were successful mating strategies. Flirterers were also more likely to be rated by peers as more physically attractive ($\eta_p^2 = .089$) and more sexually attractive ($\eta_p^2 = .086$) than Nonflirterers. Girls that consistently flirted had significantly higher body image and appearance satisfaction than Nonflirterers ($\eta_p^2 = .042$). Flirting predicted overt aggression and in part predicted delinquency when controlling for 6th grade family adversity, but did not predict relational aggression or drug problems. Taken together, these findings suggest a

developmental pathway for ethnically diverse adolescent girls of risky, aggressive behaviors having a positive, significant relationship with flirting behavior. These findings were discussed in the context of theoretical literature on evolutionary theory as well as understanding adolescent girls' aggressive, risky behavior as adaptive for mate success.

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Chapter I

INTRODUCTION

There is an established literature from evolutionary developmental psychology that developmental processes, specific environments, and personal characteristics (inherited but interacting with the environment) shape how humans choose their mating strategies. Mating effort, the work put into acquiring one or more romantic partners, is the term used by researchers to describe intrasexual competition, the term coined by Darwin for competitive behaviors and strategies individuals use to compete with same sex opponents to acquire a mate or date. For adults, one's mating strategies relate to how much parental investment they are planning to invest in offspring. Parental investment has been thought about as ratio continuum called the r/K continuum. R species are those that procreate hundreds or thousands of offspring, providing little or no care to these offspring (e.g., specific species of insects). True K species have four or less offspring. They often spend a great amount of resources and energy in raising offspring, such as building a home and feeding them. Many species of primates fit the description of K species as they devote their lives caring for their young, including training them to be successful parents (Ellis, 1988, p. 702).

The variety of mating strategies and amount of mating effort used by humans have been explored extensively in the literature (Buss, 1988a; Buss, 1988b; Buss & Schmitt, 1993; Walters & Crawford, 1994). Different strategies are employed depending on desired length of relationship and outcome (e.g., having one offspring, having multiple offspring). It has been proposed that some people have the proclivity, based on development, family background, and personal characteristics, to engage in short-term mating relationships and lean more r-selected on the r/K strategy continuum. Researchers have theorized that r-selected humans originate from an

unstable environment, use more short-term mating strategies and have more children in whom they invest less, than K-selected humans. K-selected humans come from a stable environment, are more selective in their mate choices and have fewer children in whom they invest more (Draper & Belsky, 1990; Ellis, 1988).

It has been proposed that as adolescents age, they move from an r-selected strategy of many short-term mating relationships into a K-selected strategy of one, stable long-term relationship in adulthood (Ellis, 1988). However, not everyone follows this pattern of change because some adolescents have a more stable, K-selected strategy in adolescence which continues into adulthood. Conversely, some adolescents begin as r-selected and never move into a K-selected strategy in adulthood. The developmental pattern of strategy may have implications for their adjustment as adults as well as for their offspring.

Research has demonstrated that humans who are more interested in attracting a mate for a short-term relationship (or are more likely to lean towards an r-selected strategy) are more likely to use mating strategies which are aggressive. These strategies involve derogating same sex competitors, using relational aggression, and physical combat (Schmitt & Buss, 1996). Theoretically and empirically, mating effort strategies have been linked to aggression as a trait, delinquent behaviors, and aggressive mating strategies, such as physical combat with a competitor (Campbell, 1995; Charles & Egan, 2005; Lalumiere & Quinsey, 1996; Rowe, Vazsonyi, & Figueredo, 1997). It is often suggested that aggression may be an adaptive strategy from an evolutionary standpoint, though it is often viewed as a socially, maladaptive trait. The relationship between mating effort behaviors and aggressive and risky, delinquent behaviors indicates that antisocial behavior enhances reproductive success (Lalumiere et al., 2005; Quinsey, 2002; Rowe et al. 1997). These strategies are effective in attracting short-term sexual

relationships. The more sexual relationships one has, the more likely they are to increase their reproductive success.

The theoretical link between risky, aggressive behaviors and competitive mating effort strategies has been discussed widely in the literature for different age groups. There has been a particular research focus on adolescence, the time when mating strategies are first employed. For adolescent boys, in general, a simultaneous increase of aggressive and risk taking behavior, including drug and alcohol abuse, and mating effort and interest in dating relationships indicates that these behaviors constitute an aggressive mating strategy pathway. Wilson and Daly (1985) named this pathway the Young Male Syndrome (YMS). While the use of 'syndrome' in previous literature suggests a pathological pathway, it is proposed here that it is a developmental pathway starting in early adolescence as opposed to a 'syndrome'. Some boys follow this mating strategy pathway while others do not.

With adolescent girls there has been little empirical investigation of whether there is a Young Female Syndrome or a developmental pathway for girls that parallels the profile of YMS. There have been very few empirical studies which investigate whether there are adolescent girls who are more r-selected than other girls. However, research exploring why adolescent girls engage in physical and verbal arguments with each other suggests that they do so as part of their mating strategies (Campbell, 1995), indicating a developmental pathway that may have a similar profile to YMS. Researchers have investigated a life course pattern and outcome of r-selected adolescent girls. Regarding the life course pattern, there is evidence that harsh familial and environmental events (particularly, father absence during childhood and maternal harshness, collected at age 4 years, 6 months of age) are strongly associated with the use of an r-selected strategy. Research has indicated that r-selected women have earlier puberty onset, earlier sexual

debut (Belsky, Steinberg, Houts, & Halpern-Felsher, 2010; Ellis & Essex, 2007), and more children with less investment in any one child (children with different fathers, closer birth spacing, etc). Researchers have not investigated what traits and mating strategies comprise the r-selected pathway for girls. For boys, we know that these strategies including aggression and risk taking behaviors of delinquency and drug and alcohol use. Also, aggression and risk taking are linked to adults who lean r-selected, so it could be that for young adolescent, girls who lean r-selected that they too use these strategies. It would make sense if this life pattern were associated with increased mating effort, risk taking and aggressive behaviors.

Studies have demonstrated a connection between mate value and mating effort. Mate value is one's characteristics that make them a desirable mate. For women, this includes demonstrating the ability to be a good partner and mother as well as attractiveness, which is a sign of good health and good genes. Research findings have demonstrated that older adolescents who have high mate value also have increased mating effort (Rowe et al., 1997). This needs to be explored further in order to understand how attractiveness interacts with mating effort in younger adolescent girls.

The study assessed the validity of a new way of measuring mating effort – a peer rated item of flirting – in order to assess the existence of an increased mating effort and aggression pathway in girls. Researchers have designed empirical studies in which participants were asked what strategies are *hypothetically* most successful and most often used by their peers, but have not asked participants to rate other participants on their mating effort (Buss, 1988a; Buss 1988b; Buss & Schmitt; 1993; Schmitt & Buss, 1996). This study aimed at using a peer-rated measure of flirting in order to assess the degree to which this strategy is used developmentally across early adolescence and its relationship to peer ratings of overt and relational aggression and

attractiveness as well as self-reported use of substances and delinquency and self-report appearance satisfaction. The act of flirting has been included in many researchers' operationalization of a mating strategy construct (Bleske-Rechek & Buss, 2006; Buss 1988a; Walters & Crawford, 1994).

This study addressed the following questions: Is there a profile in girls, similar to YMS, as would be seen in a profile of high risk taking, high aggression towards peers and increased mating effort? Are girls with certain physical characteristics (more physically and sexually attractive) more likely to adopt this pathway of high mating effort and increased risk taking and aggressive behaviors, perhaps because it is more likely to be successful as a mating strategy, than girls who are not physically and sexually attractive? Are adolescent girls from more adverse family environments more likely to have this profile, if it exists?

Evolutionary Theory

Evolutionary psychology is defined as the “systematic study of the biological basis of all forms of social behavior, including sexual and partner behavior in all kinds of organisms, including man” (Wilson, 1978, p. 10). Evolutionary theory states that organisms must have success in reproduction in order to pass genes along or have ‘gene legacy’. Reproductive success is defined as producing at least one offspring, who in turn is able to engage in reproductive success. It also involves supporting the reproductive success and thriving of close kin, who share similar genetic makeup.

Evolutionary theory has been used productively to explain aspects of human behavior, mainly behaviors relating to reproductive success (Quinsey, 2002). Evolutionary theory can help explain interpersonal interactions, specifically dating, mating, and marriage. The struggle for survival of our ancestors involved fighting for resources, reproductive access, and shelter, all of

which are components involved in increasing one's reproductive success. In addition to the struggle for survival there is a struggle for attracting quality mates, and from this, buds the theory of sexual selection (Buss, 2009). The theory of sexual selection, an essential component of evolutionary theory, involves the evolution of traits that aide in competition for mates as opposed to survival (Buss, 2007). Darwin theorized that any trait or characteristic that promotes survival may also promote the probability that an organism will procreate and therefore pass this special trait onto offspring (Hrdy, 1999). Conversely, he also noted that some genetic traits were passed on to offspring, which did not enhance survival, but did enhance reproductive success and thus coined this occurrence as sexual selection.

Parental Investment and Mate Selection

Trivers expanded on Darwin's theories of natural selection and sexual selection by including the concept of parental investment in offspring. He defined parental investment as "any investment by the parent in an individual offspring that increases the offspring's chance of surviving (and hence reproductive success) at the cost of the parent's ability to invest in other offspring" (1972, p. 139). These benefits generally include anything that an offspring can benefit from as well as the genes passed from parent to child. He also differentiated parental investment from mate selection. He argued that mate competition and selection do not directly affect whether the offspring survive, and are therefore not incorporated in the concept of parental investment. Also, if parental investment is large for one offspring, this may negatively affect the procreation and ability to raise another offspring (Trivers, 1972).

Trivers also noted that species vary in the amount of parental energy invested in offspring. In most species the male invests only his sex cells and females do the child rearing. However, males can provide support in several ways, such as defending his partner and their

home, as well as discovering or building a habitat for his partner and offspring. Interestingly, sex role reversal can occur in species in which the male is the primary investor of offspring. For instance, in some breeds of fish and frogs the male lays the eggs. The females are often bigger in size and take on what would normally be considered male mating strategies, such as aggressively competing for mates. Also, because the males in these species carry the burden of laying eggs, the females have a lower amount of parental investment (Trivers, 1972).

For the human species, Trivers proposed that men use a mixed strategy of parental investment and continued mating strategies: they invest in their offspring by helping to raise them and providing resources, but they also continue to seek other mating opportunities as well. With that, any offspring resulting from these affairs do not receive the same level of parental investment as the offspring who are the byproduct of the male and his long-term partner. For women, Trivers proposed that they change their strategies to attract mates depending on their own assets. For example, he theorized that there is a trend that physically attractive women wed men who have high socioeconomic status (Trivers, 1972, p. 146). He theorized this because women prefer men who have many economic resources to provide for their offspring to ensure that their offspring will in turn have success in mating and continue gene legacy. Women have affairs to line up an extra father in times of stress, as well as to have access to better genes than their partner can offer (Brewer, 2009).

Ellis (1988) introduced another way of examining parental investment via a ratio continuum called the r/K continuum. R species are those that procreate hundreds or thousands of offspring, providing little or no care to these offspring (e.g., specific species of insects). True K species have four or less offspring. They often spend a great amount of resources and energy in raising offspring, such as building a home and feeding them. Many species of primates fit the

description of K species as they devote their lives to caring for their young, including training them to be successful parents (Ellis, 1988, p. 702).

Ellis (1988) posited that resources and the environment predict which side of the r/K continuum a species or an individual would lean toward in relation to other members of their species. He discussed how a species behaves in a 'virgin' habitat that has plenty of food and resources should sway members of the habitat to lean closer to the r continuum. However, as resources become less stable, members should lean more towards the K continuum and act accordingly (i.e., invest more in their offspring). Ellis proposed that humans lean more towards the K continuum, but this can change from individual to individual (1988). Women have long gestation periods and a finite time period for which they can have children, therefore limiting their ability to have several offspring. Therefore, humans invest greatly in the few offspring they have, which is a K-selected strategy. He also reported that within their lifetime individuals may move their position on the continuum. When an individual begins their sexual debut and starts puberty they may be more "r-selected" compared to when they are older. As an individual gets older he/she will spend less time and energy looking for mates, with the objective of procreating. The individual may spend more time devoting his/her resources and time to the "preservation of whatever descendants they already have" (Ellis 1988, p. 699). Thus, humans become more "K-selected" with age.

Parental certainty and mate selection. Trivers (1972) argued that gender differences drive both parental investment and competition and the two are related. In humans, women are certain that a child is theirs, while men are not, and thus, they have the ultimate responsibility in raising children. Therefore, they are more selective in choosing a mate than men, and so desire to have a father of their offspring who will impart "good genes" (Trivers, 1972). Women should

also desire the father of their offspring to have ample resources and ability to protect her and the offspring (Buss, 2003). Men do not have paternal certainty and their presence may not be necessary for the survival of a child, therefore they should not invest as much time, effort and resources into their offspring as women (Trivers, 1972).

Based on parental certainty or lack thereof, it is believed that there are considerable differences in criteria for mate selection. Trivers believed that men should adopt a mating strategy that most emphasizes access to fertile mates because males should invest less in offspring than females. Women should adopt mating choice strategies in which they are more selective about whom they mate with and hold out until they have found the “best” mate. A woman has to make at least a nine month commitment to her offspring, during which time she is not able to pursue other mating opportunities. In terms of genes and potential for high parental investment in mutual offspring, Trivers also thought that bad mate choices affect women more than men via their parental certainty (1972). Women should be choosier as the cost of choosing a mate with poor characteristics and resources is greater as well as the opportunity costs of having to await the nine month pregnancy before procreating again. Research has provided evidence for the theory that women are choosier in their mate selection (Buss & Schmitt, 1993).

The theories of parental investment, and specifically parental certainty, play a key part in many aspects of mating. As Trivers noted, “It can be said that parental investment gender differences drive the force of mate selection” (1972, p. 173). Parental certainty relates to competition for mates because men are competing for women who are selective because of their guaranteed parental certainty. This is the driving force for competition: if women were not choosy, they would mate with anyone, and no man would need to have a competitive advantage

over another. Thus, men should be competitive in scouting for fertile females as they invest less in their offspring than women because they have less parental certainty.

In summary, evolutionary theory posits that there are gender differences regarding mating effort and mate choice. It is theorized that men attempt to procreate more frequently than women, are more aggressive, and are less selective in their mate choices because of their parental uncertainty (Bateman, 1948). These gender differences are relevant as they may shape how males and females interact with one another. They also impact how each will interact within their gender. In terms of the r/K continuum there are differences between the sexes in parental investment. Men lean more towards the r extreme of the continuum than women because men have parental uncertainty and therefore less obligate investment. They should therefore spend more time finding mates and procreating and less time engaging in child rearing as compared to women who should spend their time in an inverse manner, with more time spent child rearing and less procreating.

Sexual Strategies Theory

Darwin defined sexual selection as involving two main concepts: competition within one sex for members of the opposite sex, called intrasexual, and differential choice by members of one sex for members of the opposite sex, called intersexual competition (Buss, 2007; Simpson, Gangestad, Christensen, & Leck, 1999; Trivers, 1972). This competition exists because, as Trivers theorized, one's selectivity in choosing a mate depends on his/her parental certainty. Thus, because females are selective in choosing a mate, males must compete to be chosen. Specifically, Darwin viewed this as males competing with other males within their species (intrasexual competition) and females choosing certain males over the others (intersexual competition). Darwin considered intersexual competition 'female choice' because females are

pickier about whom they mate with than males. Women need to be pickier because they have the burden of the gestational period, labor and delivery. However, in monogamous societies male choice also exists and thrives (Buss, 1988a). In monogamous societies, men have increased parental certainty than in societies where people do not commit to monogamous relationships. Therefore, males must be choosy in who their one partner will be to ensure this partner has high mate value and can successfully raise children who will also have high reproductive success.

Male animals engage in intrasexual competitive activities to attract the opposite sex and display their resources, dominance, and “good genes”. The hallmark example of sexual strategies theory is male peacocks displaying their beautifully feathered tails. Darwin wondered why the trait of having a large, colorful tail was passed on from male to male, especially considering the disadvantages a peacock may have by displaying and carrying around such a tail. Such disadvantages include being more obvious to predators and making it hard to exit quickly if under attack (Hrdy, 1999). He presumed that the male will pass on these genes of beautiful feathers to his son, and that son will be able to also attract female peacocks, and thus the paternal gene is carried on and reproductive success is fulfilled. More recent studies have found that the feathers are also a sign of health and lack of parasites, which will be passed on to male offspring (Buss, 2009). Darwin noted that this trait may jeopardize the peacock’s survival, but also puts the peacock at an advantage to be selected by peahens to mate, and therefore increase reproductive success.

Until recently female-female competition had been rarely studied (Hrdy, 1981). Hrdy reported that, based on Darwin’s assumptions regarding female competition and ‘female choice’, many scientists discounted the idea that female competitiveness is adaptive (1999). Previous Darwinian theorists also surmised that there was no hierarchy of females ranging from least to

most reproductively successful. Hrdy noted that Darwin's successors assumed that male competition explained sexual selection for males and females, whereas they missed the idea that there is variance among female reproductive success, which may influence female intrasexual competition. Female reproductive variance had not been explored or explained. Some specific sources of variance in female reproductive success that were missed include age of mother at her first offspring's birth, period of time between births, and the influence of social environment and resources such as food and habitat (Hrdy, 1999).

Hrdy (1981) surmised that among several species there is evidence that females are competitive and strategize against one another. She argued that female competition was ignored because researchers primarily focused on male competition and female competition is often more subtle than male competition and is characterized by subtle and covert aggression dissimilar to male intrasexual competition which is more overt and prominently displayed aggression (Hrdy, 1981). Hrdy also noted that while women who are not related to one another compete, they also collaborate and support one another as well. Both topics need to be researched more thoroughly.

Introduction

Competition for Mates

Researchers have recently expanded upon Darwin's theories of intersexual and intrasexual competition in humans and have conducted studies which support these theories. For instance, humans compete for resources to enhance their appeal to the opposite sex, specifically for resources that will help them have an advantage over others reproductively, such as money, food, and shelter (see Buss, 1988a; Quinsey, 2002 for comprehensive reviews of this research). They also directly compete with same sex competitors to flaunt desirable characteristics and demonstrate they are the better mate choice. The expansion of Darwin's theory has also included

intrasexual competition in women, which will be reviewed in the Mating Effort and Aggression subsection.

Simpson and colleagues (1999) classified intrasexual competitive behaviors as falling into two basic categories. The first category, direct competitive strategies, involves directly comparing oneself to competitors. For instance, boasting about awards or athletic accomplishments among a group of rivals demonstrates someone attempting to directly, publicly compare oneself to competitors. These strategies assist an individual in showing off positive aspects that are desirable in short-term mating, including good health, genes which promote reproductive success, and the ability to protect a mate and offspring. They predicted that this category of strategies was primarily used with short-term mating as the goal because they are signs that the mate will be successful in reproduction and these signs are hard to impersonate (i.e., it is difficult to fake that you have a strong physique for this an observable trait). The second category they proposed was demonstrating positive qualities and characteristics about oneself to possible mates. This may include having personal conversations with possible mates, complementing them, and demonstrating prosocial qualities, such as being caring. They concluded that this strategy is primarily used in finding a long-term mate. Lastly, Simpson and colleagues reported that, “Both types of tactics convey positive impressions of the self through verbal and nonverbal signals” (1999, p. 160).

Indirect intrasexual competition. Thornhill and Alcock (1983) identified four aspects of intrasexual competition among species; (a) capacity and skills in locating a mate; (b) displaying interest and willingness to mate; (c) acquiring resources and materials that are desired by the opposite sex such as money and a home; (d) and changing or enhancing one’s appearance

(as cited in Buss, 1988a). Buss proposed that these four ways of indirect, intrasexual competition are more common than competitive physical fighting among humans (1988a).

Geary also reported that men, as opposed to women, engage in indirect intrasexual competition not always to attract a mate, but to raise their status and social influence among their male peers (2010). These behaviors can include a rivalry over positions of dominance over another member with the goal of dominating a competitor in some arena whether it is social status, employment, sport, and etcetera. Therefore the direct goal is not attracting the mate, but these behaviors of social dominance may indirectly impact one's ability to attract a mate, or increase one's mate value to the opposite sex. It is thought that a position of dominance will seem more attractive to mates, so this is also considered part of intrasexual competition (Buss, 2007). Mate guarding and retention can be viewed as indirect competitive strategies, including maintaining physical appearance and closely monitoring a partner's behaviors (Geary, 2010). It can also include relational aggression, which will be discussed below.

Mating Effort and Competition as a Mating Effort Strategy

Definition. Rowe and colleagues defined mating effort as “that portion of the total reproductive effort that is invested in the initial acquisition of mates as sexual partners” (1997, p. 106). Sexual partners may be a casual date or a long term relationship, depending on the goal of the pursuer. Mating effort may vary from individual to individual based on age, gender, cultural identification, religion, education and many other personality and environmental factors. Mating effort can be closely tied to, or encompass intrasexual competition proposed by Darwin and his successors, such as the strategy of verbally or physically fighting and competing with others of the same sex to obtain a mate. These strategies have also been called behavioral tactics of intrasexual competition (Simpson et al., 1999). Rowe and colleagues did not mention intrasexual

competition in their review of mating effort. However, after close examination of their Mating Effort Scale, it is clear that they adopted concepts of intrasexual competition as part of a general term of mating effort by including such items as, “If other guys think I am ‘tough’, they will stay away from my girlfriend” (Item 10; Rowe et al., 1997, p. 109). For this item, the male would have to display his characteristic of strength or toughness when in front of possible competitors, which is a strategy of intrasexual competition.

Rowe and colleagues described what is involved in human mating effort. They reported that a male who engages in “high” mating effort might be on the lookout for several mating chances. Upon finding a mate, he may guard her jealously so that no other males are able to access her. This is considered mate guarding. It is also believed that a person who engages in frequent and a high degree of mating effort would be more likely to leave a mate for a new mate. A high mating effort individual also may not be an invested parent, as the main objective is mating, not rearing children (Rowe et al., 1997).

Other researchers have offered other, similar definitions of mating effort. Lalumiere and Quinsey described mating effort as “energy expenditure allocated to locating, courting, and sexually interacting with individuals of the preferred sex and age” (Lalumiere & Quinsey, 1996, p. 34; Quinsey, 2002, p. 4). These researchers noted that mating effort is different than parental investment, because parental investment involves caring for and protecting offspring, whereas mating effort is focused strictly on acquiring mates. These researchers also included intrasexual competition in their definition of mating effort, making it clear that intrasexual competition is an integral part of finding a mate and much effort is needed to compete with the same sex (Lalumiere, Harris, Quinsey, & Rice, 2005).

Neither of these groups of researchers commented on whether mate retention behaviors, behaviors in which one engages to guard and keep a mate, are included in the definition of mating effort. Mate retention behaviors may overlap in terms of actions one takes, but have a different objective than mate acquisition behaviors. Buss and colleagues suggested that mate retention strategies also fall within the confines of mating effort - "Mating effort may be partitioned into at least two distinct domains—effort devoted to attracting a mate... and effort devoted to retaining a mate" (Buss, Shackelford, & McKibbin, 2008, p. 323). While Rowe and colleagues did not explicitly address mate retention behaviors, it is clear they viewed mate retention behaviors as part of mating effort. In analyzing their Mating Effort Scale there are 3 of 10 items, which directly relate to mate retention strategies, such as "I would get back at someone who looked at my girlfriend in the wrong way" (Item 5; Rowe et al., 1997, p. 109). Therefore, both mate retention and mate acquisition behaviors will be reviewed as part of mating effort strategies. Based on this review of the literature, intrasexual competition will be considered a part of the construct of mating effort. Both intrasexual competition and mating effort are subsumed under the construct of mating strategies.

Mate goals and desires. Humans may attract a mate with a number of goals in mind. These goals include the amount of time one plans to court or mate with the person whom he/she selects. Short-term mating includes minimal time frames such as one night or a few months. Long-term mating can be defined as a year or more or with an end goal of marriage (Apostolou, 2009; Buss, 2007). The literature indicates that men prefer short-term mating more than women. For example, Buss and Schmitt collected self-report data on 148 college students regarding their preference for short-term or long-term mates. They found that men more often than women reported they were looking for a short-term mate (Buss & Schmitt, 1993). Apostolou found

similar results in that men were more accepting of short-term mating than women in an online survey of British adults (2009). Advantages for women for short-term mating include the resources involved such as a romantic dinner, presents, or protection from a partner in a dangerous environment.

The varying desired lengths of time of mating/dating may influence what someone is looking for in a mate and which resources and mate characteristics will be the priority. This is especially true for women. Women's preference for mate characteristics change based on what kind of date or mate they desire. Interestingly, women's intrasexual competitive tactics may also be directly influenced by their suitor's goal in mating. For instance, if a woman is denigrating a rival to a male by telling him that the other woman is "easy to get into bed" this may work if he is looking for a long-term mate but backfire if he is desiring a short-term mate. He may choose the rival based on the new information provided to him that he will easily be able to have sex (Buss, 2009).

Based on previous research, Buss outlined several characteristics that women look for in a mate, noting that these characteristics may move up and down on the list of priorities, depending on the length of relationship desired. These include economic resources and capacity, social status, age, ambition, dependability and stability, intelligence, compatibility, size and strength, health, and love and commitment to partner and offspring (Buss, 2003). Women prefer a mate who will invest his resources in her and her offspring, provide physical protection, show capabilities as a parent, and who is compatible in goals and values. He also noted that there is not a one to one correspondence between desires for mates and the actual mates one is able to attain, as one's own mate value must be considered as well as the effectiveness of strategies to obtain these desired mates (Buss, 2007). Homophily, or the choice of mates who are similar in

traits and background is an additional factor in mate preferences for both genders. Simon, Aikins, and Prinstein (2008) reported, “A general tendency to be attracted to similar others increases the odds of choosing partners who share commonalities” (p. 1676). These commonalities are strengthened through the duration of the relationship and provide for a more compatible relationship.

Mate value. A best mate can be considered someone who has the best resources via Darwin’s theories of natural selection and sexual selection. Those males who have the best resources will hypothetically pass those “good genes” and resources onto their offspring. One can logically surmise that the key strategy here is to display one’s valuable resources and characteristics. Trivers reported that women should select a mate who provides material, social, and psychological resources (1972). Men who prominently display such resources will have better chances attracting a mate. On the other hand, men are thought to prefer women who are reproductively valuable (i.e., fertile, young) and available so they can increase chances of reproductive success. Also, it is thought that men prefer women who are more attractive because attractiveness symbolizes youth and health and therefore reproductive value (Buss, 1988). Empirical studies have shown that the most attractive people possess good body and facial symmetry. It is thought that the symmetry is a sign of good health and good genes (Simpson, et al., 1999). It is thought that a woman’s youthfulness will symbolize her fertility as well and is therefore beneficial for women to display this characteristic.

Geary proposed another theory regarding the role that resources play in mate competition for men. He argued that men’s desire for control in interpersonal relationships is driven by their goal of acquiring as many resources as possible. By acquiring as many resources as he can, a man will become the most desirable mate to women, as women look for a man who will invest

the most resources in their children. He also stated that even if men compete for resources that they already have, for instance a rich male competing with colleagues at work for more riches, he is doing so to keep the resource away from the competitor, not just to acquire it for himself (Geary, 2010). The assumption is that those with higher mate value are better competitors in the acquisition of resources.

One's own mate value may also predict what mating effort strategies will be used and how much energy one must put forth to obtain a mate. It is thought that a person with a higher mate value (aka someone who possesses the key qualities that the opposite sex prioritizes) will be able to find a mate who also has high mate value using "preferred mating strategies" (Buss, 2003, p. 285). Those with lower mate value will have to settle for a mate with lower mate value and possibly have to engage in alternative mating effort strategies (Buss, 2009). Further research on this topic is needed as researchers have not specified which strategies are the preferred strategies used by those with high mate value and those which are used by those with low mate value. It may be the case those with low mate value utilize more aggressive strategies than those with high mate value.

Mating effort strategies and tactics. In humans, females and males have similar tactics and strategies, though some are more commonly used by females, others, more commonly used by males. The research studies reviewed below highlight significant similarities and differences among male and female mating effort and behavior. The studies described investigate the various strategies used to find a mate, involving direct competition within gender and indirect competition (e.g., defending one's social status). Based on the research available it seems that there are gender differences in types of strategies used and evidence that, in general, males expend more energy on finding a mate than females (Lalumiere et al., 2005).

Mate retention strategies. Mate retention has been regarded previously in the literature as mate guarding and sexual jealousy (Buss, 1988b). However, Buss reported that these two strategies are actually subsumed in the larger construct of mate retention strategies. Generally speaking, mate retention behaviors aim at decreasing partner's cuckoldry. For males this is particularly important because of their parental uncertainty, and for females this is important so that they are not abandoned and left with little resources and no protection for them and their offspring.

Sexual or romantic jealousy is considered the motivation to engage in mate retention behaviors (Brewer, 2009). In the context of the social environment, jealousy may be viewed as a negative or maladaptive behavior, however in the context of reproductive success it is considered an adaptive strategy as it leads to the use of mate retention behaviors and keeping one's mate from leaving. Brewer reported, "The elicitation of jealousy allows an individual to identify those individuals or circumstances that present the greatest threat to their relationship" (Brewer, 2009, p. 479). Romantic jealousy can be separated into three elements including *emotional jealousy*, which is one's reactions and feelings about events that threaten the romantic relationship; *cognitive jealousy*, which includes being suspicious or concerned of an actual or perceived threat; and *behavioral jealousy*, which are the mate retention strategies one uses to decrease the threat to the relationship (Pfeiffer & Wong, 1989). Jealousy is also adaptive in that it helps individuals communicate to their partner that they care and love them and are committed to the relationship.

Buss conducted a series of studies to investigate what mate tactics are used to keep a member of the opposite sex as a significant other/mate and whether these tactics were effective. First, he conducted a qualitative study with college students to collect information on which

strategies/acts men and women use to keep mates. He gave participants a probe, which began with, “In this study we are interested in the things people do when they want to prevent their partner from getting involved with someone...” (Buss, 1988b, p. 296). He asked all participants to list mate retention behaviors that males use and that females use. Participants also sorted these acts into categories of tactics. Buss’ study provides evidence that there are gender differences in kinds of tactics men and women use to keep a mate. In his study, male undergraduates were more likely to display resources, such as talking about their potential or actual wealth, showing off cars, and talking about their accomplishments. Female undergraduates were more likely to use the tactic of signaling their reproductive value and availability such as altering their appearance, wearing stylish clothing, and staying well groomed. Despite these differences, both sexes generally used the same or similar strategies. For instance, the most frequently used tactic by females (out of 104 tactics) was “I was helpful when he really needed it” and this tactic was fourth most frequently used by males. Also, the most frequently used tactic by males (out of 104 tactics), “I complimented her on her appearance” was the third most frequently used tactic for females (Buss, 1988b).

In the second study, Buss used the acts from his qualitative study with a new sample of undergraduate men and women (26 females, 20 males). During this study, Buss also investigated if there was a relationship between effectiveness of an act in keeping a mate and the frequency of using each act. In this study he asked participants to rate the acts on how effective they were in successfully retaining mates for males and then for females. The data supported his hypothesis in that acts that were judged as more effective were the acts that were more frequently endorsed by college students interviewed on what their friends of the opposite sex do in study 1.

Buss concluded that the best mate retention strategies are those which emphasize one's mate value and emphasize the characteristics that potential mates might be attracted to (Buss, 1988b). In other words, the desires of the mate are what drive the kind and type of behavioral tactic that will be used. For example, via research it is known that men desire an attractive mate, so women use makeup and other products to enhance their appearance and will comment on other women's uglier features (Buss, 2007). He also concluded that intrasexual competition exists, possibly at the same strength, for women as it does for men. Buss noted that more studies are needed that explore mating tactics of different ages and ethnicities (1988b).

Mate acquisition behaviors. Walters and Crawford (1994) set out to replicate Buss' 1988a study on mating tactics. However, they slightly reframed the questions they asked participants. Instead of asking subjects what strategies they used to keep partners as Buss did, they asked subjects about how they compete with others of the same sex. No specific kind of competition was discussed to encourage the participants to come up with as many competitive situations and strategies they could. They hypothesized that competitive intrasexual behaviors would directly relate to attracting and securing a mate (Walters & Crawford, 1994).

Walters and Crawford investigated their hypotheses via four studies. In study 1 the researchers interviewed participants to find out what behavioral acts they engaged in to compete with others. The participants were recruited from an undergraduate institution and had an average age of 21. These behaviors were grouped into categories by four independent coders (two men, average age 37) with the idea being that acts grouped together have similar end goals. Acts that were not specific or too vague were eliminated during the categorizing process. Also, only acts that were considered "good examples" of intrasexual competition were included. Acts

that could not be agreed upon by three of four raters were removed from the list of tactics for subsequent analyses (Walters & Crawford, 1994).

Researchers sorted the tactics under one of two possible umbrella terms based on Buss' work (1988a). The two terms were (a) acts that included specific behaviors or actions, such as “displaying” or “acquiring” and (b) acts that included adjectives or descriptive details pertaining to competition such as “status” and “resources” (Walters & Crawford, 1994, p. 9-10). The raters were presented with a table (Walters & Crawford, 1994, p. 10). The rows include descriptors of the kinds of acts, such as intelligence, appearance and athletic ability and the columns represented the “arena of competition” (i.e., use deception, attract attention to). The cells in the table where the rows and columns intersected included a definition of the specific tactic. The raters filled in the cells with acts reported by the participants. Results of the independent coding indicated 79 acts under the categories of 26 tactics. Tactics had varying amounts of acts within them, varying from one to eight acts. These tactics were used to create the interview questions for the subsequent studies. The researchers indicated that for some acts, it was difficult to distinguish if the motive for the act was to compete to attract a mate or to compete for something else, such as social status. Walters and Crawford reported that by eliminating those acts were perceived not to be examples of competition they may have missed subtle acts of competition. An example of this was when a female reported, “I stole my friend’s eye-liner at a party so that she couldn’t apply any more make-up” (Walters & Crawford, 1994 p. 12). This may in fact be an example of the covert competition in which women engage.

In study 2, Walters and Crawford investigated how frequently the competitive behaviors were used by male and female participants by asking them how frequently they used each act in the past year using a Likert scale. Researchers then created a questionnaire with the 79 acts the

participants had identified in the first study. The participants in this study were averaged age of 23. A mean frequency score was created for each tactic. Gender differences were examined based on the results of this questionnaire. The researchers found generally that results regarding gender differences for competitive tactics and frequency of use of tactics were replicated from Buss' study. The tactics of using risk in athletics, demonstrating resources, and attracting attention to alcohol use were used more frequently by male participants than by females. The tactics of attracting attention to one's appearance and manipulating status (i.e., manipulation of social situations and gossiping) were used significantly more frequently by female participants than males. However, there was some similarity in the tactics used and frequency of use by men and women in the study. Three of the tactics that were used most frequently by both genders were demonstrating domestic ability, attracting attention to appearance, and acquiring athletic ability. The researchers commented that these behaviors may have been the most frequently used tactics for the reason of attracting a mate, but also because they are common activities 'in daily living' (Walters & Crawford, 1994, p. 15). Lastly, the result was found that men used significantly more tactics, more frequently than women in the study. This is consistent with Darwin's theory that men put forth more effort to attract more mates than women, which may be due to their potential to have more offspring compared with females' potential (Walters & Crawford, 1994).

Walters and Crawford's (2004) third study had the same aim as the second study, to measure frequency of competitive behaviors, but the information was collected via observation rather than self-report. The researchers created a questionnaire for observers to fill out based on the questionnaire used in study two. In this study 78 undergraduates participated (mean age = 20.7). The participants were instructed to think about a close, same sex friend and included only

those participants who rated their closeness to this friend as a 4, “Close”, or 5, “Very close”. The participants rated the frequency with which their close, same sex friend used the 79 acts/tactics on a 4 point Likert scale from 1, never to 4, frequently. The results regarding gender differences in use of acts replicated the findings of previous studies. Male participants reported their close friends used the tactics of using risk in athletics, attracting attention to athletic ability, demonstrating athletic ability, demonstrating resources, demonstrating social status, using deception regarding intelligence, attracting attention to alcohol use, and attracting attention to sexual activity significantly more than other tactics and significantly more than females reported using them. Female participants reported their close friends used the tactics of improving appearance and demonstrating domestic skill significantly more frequently than the use of other tactics. These results indicate that that women were observed to perform less acts of competition with their same sex than men in study three, which may provide evidence that men have more interest in engaging in intrasexual competition and spend more efforts engaging in it than females, as Darwin suggested. The overall results of study three indicated that there is reasonably good reliability between ratings of frequency of tactics by observer and self-report. For males the correlation of tactic frequency between self-report (study two) and observer report (study three) was $r = .76$ and for females the correlation was $r = .95$. This shows that women’s reports of competitive acts are highly consistent regardless of the mode in which the information was collected (Walters & Crawford, 1994).

In study four by Walter and Crawford, participants were asked how effective they felt their competitive strategies were when they were in competition with same sex. They were given the list of acts from study one and asked to rate their effectiveness on a Likert scale ranging from one to seven. Participants in this study were of average age of 22 and had not

participated in any of the previous studies by the authors. The participants rated the following tactics to be most effective for men and women: lying about having more income, hiding information from friends so friends wouldn't think they were "uncool", paying attention to neatness in other people's houses to make their own house look better, and befriending the most popular peer (Walters & Crawford, 1994).

Via analyses of variance, main effects were found for gender of rater for the acts of use of deception in sexual activity and acquiring sexual activity in that males perceived these acts to be more effective than females in the study. An example of deception in sexual activity given by the authors was "I dated another guy's girlfriend". An example of acquiring sexual activity was "I broke up with a woman so that I could go out with someone better looking" (Walters & Crawford, 1994, p. 11). There were several tactics that had significant main effects by gender of actor. Male and female participants rated use of risk in athletics, demonstrating athletic ability, demonstrating status, demonstrating resources, use of deception and acquiring sexual activity, and attracting attention to alcohol use as significantly more effective acts for men than for women. These competitive tactics were also the more frequently used tactics as reported in study two, besides the acts regarding sexual activity. Male and female participants in study four rated acquiring domestic skill, attracting attention to appearance, and improving appearance as more effective for females than for males. Similarly, in study two, the result was found that attracting attention to one's appearance was used more frequently by women. Also, results in this study supported Buss' findings and hypothesis that the more effective competitive tactics are used more frequently to attract mates than less effective tactics (Walters & Crawford, 1994).

Walters and Crawford reported that, overall, study four provided evidence for Buss' prediction and result that "tactics relating to acquisition and display of resources will be

considered more effective for men” (1994, p. 24) and that men engage in tactics relating to trying to acquire sexual activity more than females. There was support for Buss’ predictions regarding female use of appearance related tactics and that these tactics were considered more effective than other tactics for females.

Simpson and colleagues (1999) also investigated mating effort strategies. They were most interested in a specific kind of competition: the ability to draw attention to oneself, attract a mate, and initiate a romantic relationship with the opposite sex. In their study they recruited heterosexual undergraduate level men and women on a college campus who endorsed being single. Each participant was told they were being interviewed as a candidate to go on a romantic date with an opposite-sex person who was physically attractive. Participants were interviewed via a pre-recorded video and the attractive potential mate appeared on a video monitor to ask questions of them. To induce a sense of competition with another romantic rival, the participants were told that the interviewer was going to choose either them or another suitor for the date. After the interview, the interviewer asked the participant to explain to the competitor and the interviewer why the participant should be chosen for the date over the competitor. The tactics the participant used in their explanation were rated by 5 coders (undergraduate college men and women) blind to the purpose of the study (Simpson et al., 1999).

The researchers in this study predicted that men whose physical features were more symmetrical (i.e., variation of configuration of facial parts, such as eyes, lips, when a line is drawn vertically down the center of a face) and who had more unrestrictive sexual patterns (i.e., were more likely to engage in sex earlier in a relationship) would be more likely to use the tactic of direct intrasexual competition, such as sharing that they are better than the competitor. They predicted this because it can be costly to engage in direct intrasexual competition as it poses risk

to bodily harm and the risk of losing could send a message to opposite sex potential mates of weakness, lack of ability to compete, and worse, could highlight that the competitor is a better suitor. The researchers suggested that because this strategy is risky, that those who use it should have all the attributes needed to compete successfully, including symmetry and attractiveness. They also predicted that men who had physical features which were less symmetrical and were more restricted (i.e., people who require more commitment in a relationship before engaging in sexual activity) would utilize competitive tactics that were more indirect, such as boasting about their positive characteristics, especially characteristics that a mate may look for in a long-term partner. They made no predictions regarding under which conditions women in their study would use indirect or direct competitive strategies (Simpson et al., 1999).

The results revealed seven major categories of behavioral tactics coded by the undergraduate raters: just be self, assert superiority, assert niceness-promise good treatment, claim communality (e.g., having similar goals and interests), claim to be likeable, claim to be a good conversationalist, and ensure a good time (Simpson et al., 1999, p. 164). They also found gender differences in the use of these tactics. They found that men used the tactics of promising to treat their partner well, asserting superiority, and used humor and direct approaches significantly more than women. However, they found similarities in mating strategies between genders. Males and females shared that they and their partner would have a good time above any other strategy and neither sex was likely to employ the use of humor as a strategy. The research team also factor analyzed the tactics to develop clusters of behavioral tactics. Asserting superiority and directly approaching loaded positively, and just being self, and using humor loaded negatively on the first factor for men. This factor was labeled *direct intrasexual competitive tactics*. For the second factor, named *nice-guy self-presentation*, asserting niceness

and using humor loaded positively for men, while ensuring a good time and claiming communality loaded negatively for male participants on this factor. This factor represented the strategy men use to demonstrate they are caring and nice individuals who are respectful of women. The third and final factor was named *interest in getting personal*, and the behaviors that loaded on this were being a good conversationalist, focusing on conversation, just being self, and claiming to be likable (Simpson et al., 1999).

For women, only asserting superiority loaded positively, and only just being self loaded negatively for factor 1 known as *direct intrasexual tactics*. It seems that the use of direct, daring approaches did not load highly for women. The second factor for women was similar to men, and was named *ensure fun*. For this factor ensuring a good time, claiming communality, claiming to be a good conversationalist all loaded positively. This factor included some direct tactics.

In investigating their main hypotheses, Simpson and colleagues found that men with symmetrical physical features were more likely to use direct mating tactics rather than asymmetrical men. Specifically men with symmetrical features used the strategy of asserting superiority more often and used the strategies of just being self, stating communalities, communicating likability, and using humor less often than asymmetrical men. Men with the more unrestrictive sociosexual orientation were also more likely to use direct competitive tactics and were less likely to use tactics that loaded on the *nice-guy self-presentation* factor. For instance, they were less likely to claim niceness. It was deemed by researchers that the variables of symmetry and sociosexual orientation (restricted versus unrestricted) independently predicted type of behavioral tactic used for the males in their experiment. For women however, symmetry and sociosexual orientation did not correlate significantly with either of the factors of behavioral

tactics. However, one finding that emerged was that women with more symmetrical features were less likely to claim likeability, though more likely to start a conversation with their interviewer. Also, women who were more likely to ensure fun on their date and who displayed more direct competitive tactics were more likely to have feelings of rivalry and competition with their competitor. These women also endorsed being more attracted to their male interviewer than other female participants.

Mating effort and reproductive success. While some researchers have operationalized mating effort and reproductive success as one construct, the two concepts appear to be related, but are separate. Mating effort and competition can be viewed as causal influences on reproductive success and acquisition of short and long-term partners. These constructs should be analyzed separately when conducting research studies and measures of mating effort and mate strategies should not include measures of reproductive success.

Rowe, Vazsonyi, and Figueredo (1997) investigated delinquency and mating effort, which will be discussed in detail below, but they also studied how high versus low mating effort (how much effort one puts forth in competing and acquiring mates) related to actual success in mating as measured by frequency of sexual intercourse and number of sexual partners. This research also provided evidence that while mating effort behaviors to acquire mates are similar to mating success, they are measured differently and thus are two different constructs, one sequentially leading to the other. In their study of adolescent males and females Rowe and colleagues measured mating effort via a ten item scale tapping into the specific behaviors one uses to attract mates (i.e., jealously guard from others, dating several members of the opposite sex at the same time). They measured success in mating by asking participants how frequently they had sexual intercourse and how many sexual partners they had in total. They hypothesized

that participants with low numbers of intercourse and sexual partners would be more likely to expend higher mating effort tactics. The results did not support their hypothesis, for male participants who had more success in sexual activity had higher mating effort. However, there were no significant findings for females (Rowe et al., 1997).

Mating effort and mating success are also related in that people may change their mating effort strategies based on the success they have with them. So if a mating strategy is working, one might continue to use it as a way of attracting mates. However, if it is unsuccessful, it is believed that one would change strategies to find ones that worked in achieving their goal of finding a mate. Lalumiere and Quinsey reported that in their previous research they found that men who have more success in mating are often seeking a short-term mate, while men who have less success in mating tend to be seeking a long term-mate. They found the opposite is true for females (Lalumiere & Quinsey, 1996).

The Influence of Adverse Environments on Mating Strategies

Researchers have noted many factors which may influence where one falls on the r/K continuum as well as what types of strategies someone will be more likely to use to pursue mates. An adverse home environment has been found to play a major role in the sexual development of male and female adolescents. Examining how adverse home environments affect puberty and onset of sexual behavior helps to explain why some adolescents and young adults use more competitive and aggressive mating strategies than others.

In their ethnographic study, Draper and Harpending theorized that males who grew up with an absent father would show more interest in and have an easier time learning competitive behaviors, have more manipulation skills, dominance striving, and sometimes engage in more physical aggression compared with males who had fathers present. They reported that this

difference in behaviors between father-present and father-absent adolescent males may be in part because these adolescents, “perceive early that the appropriate male strategy is not stable parentalism” (Draper & Harpending, 1982, p. 259). Therefore, the father-absent males may adapt mating strategies, which are empirically linked with short-term mating and low parental investment (Schmitt & Buss, 1996).

Draper and Harpending (1982) hypothesized that females who grew up with an absent father would consider male parenting unnecessary. Like father-absent males, they therefore use mating strategies related to short-term mating. This in turn would affect their reproductive and mating behaviors such that father-absent females would be less reserved in sexual activity and would engage in sexual activity earlier than girls who had a father figure in the home. In reviewing research on American populations of teens, they found very few studies which assessed specifically father-absent adolescent girls. However, they noted that “father-absent girls show ‘precocious’ sexual interest in boys, a denigrating attitude towards males and masculinity, and little interest in maintaining sexual and emotional ties to one male” (Draper & Harpending, 1982, pg. 263). They proposed that youngsters learn this more aggressive and promiscuous style of mating via their environments and then apply it as a mating strategy (Draper & Harpending, 1982).

The researchers discussed an ethnographic study conducted by Hetherington (1972). Girls in their study were aged 13-17 and came from father-present homes or father-absent homes due to widowhood, or divorce/desertion. The girls were interviewed by either a male or female interviewer. The researcher found that the girls from father-absent homes due to divorce or desertion demonstrated body language that signals flirtatiousness and sexual interest. These girls sat closer to the male interviewer, engaged in consistent eye contact, and had body postures that

signal interest, such as legs open or smiling. Father-present girls showed less of these body signals, and father-absent girls due to widowhood sat far away from the male and rarely engaged in eye contact with him. Hetherington (1972) found no differences in body language among father-present and –absent girls when the interviewer was female. The girls were also observed in their interactions with male peers at a community center dance. Trends were similar in that girls from father-absent homes due to divorce or desertion asked boys to dance, whereas father-present girls conversed with other girls at the dance, and father-absent girls due to widowhood were often found in the bathroom during the dance (Hetherington, 1972).

Also, similar to Draper and Harpending, Ellis and Essex proposed that father absence impacts timing of pubertal maturation of offspring, referring to Draper and Harpending's idea as the paternal investment theory, and went a step further. They proposed that in the first five years of life, the daughter's "neurophysiologic systems" and "motivational systems" are impacted by the father's investment (Ellis & Essex, 2007, p. 1801). These two systems then impact the female's early pubertal status and early frequency of sexual behavior. They found support for this theory in reviewing the available literature in that, among the population of girls receiving proper nourishment, girls who lived in homes where the father was absent had earlier onset of menarche. Also, they found that mothers who had healthier relationships with partners had daughters with later pubertal onset. They noted that both absence of the father and quality of the marital relationship impacted timing of pubertal maturity when controlling for other factors relating to the family environment. They explained that theorists believe these relationships exist between early absence of father, early menarche, and early sexual debut because humans have evolved to pick up on these environmental factors and adapt to them. The authors reported, "... children respond to these familial and ecological contexts by developing in a manner that speeds

rates of pubertal maturation, accelerates sexual activity, and orients the individual towards relatively unstable pair-bonds” (Ellis & Essex, 2007, p. 1800). Ellis and Essex theorized that both ecological factors, including lack of stable resources, and family factors, including marital discord, poor parent-child relationships, and reduced support from parent, had an impact on puberty. They noted that children who have protective family and environmental factors develop more slowly in terms of puberty (2007).

To investigate the impact of family environment on pubertal timing and onset of sexual behavior, Ellis and Essex recruited participants from a larger, longitudinal study, which began when mothers were pregnant with the future child participants. Mothers were excluded from the study if they were 18 or younger, jobless, a student, disabled, or did not live with the man who impregnated them. One hundred and twenty children took part in the smaller study. Researchers found support for their hypothesis that parent support for their daughters led to lower rates of adrenarche (increase in adrenal glands just before puberty), and a lesser degree of development of secondary sexual traits in fifth grade daughters. This finding was related to support from both mothers and fathers of daughters, providing evidence for the paternal investment theory. Also, being in a higher socioeconomic status caused a later development of secondary sexual characteristics (Ellis & Essex, 2007). This finding conflicts with the theory regarding r/K continuum. It was put forth by Ellis (1988), that a species should lean more r-selected in rich environments, whereas this finding suggests that a more rich environment will influence humans to lean more K-selected.

Belsky and colleagues (2010) also researched family environment and onset of puberty and sexual activity. In their previous research they had come up with the Belsky, Steinberg, and Draper (BSD) theory. They recapped this theory as, “...BSD theory uniquely and originally

hypothesized that pubertal maturation played a previously unrecognized role in linking early rearing experiences with subsequent mating and parenting” (Belsky et al., 2010, p. 121). This theory expanded on paternal investment theory by adding other developmental factors. They argued that those individuals exposed to adverse developmental factors, including maternal harshness, and negative parent-child relationships, especially in the first 5-7 years of life, responded to adverse environments by being naturally selected to speed up menarche and sexual experiences. In addition, it was theorized that these girls had a dismal view of their futures, lacked ability to trust others, and operated on the assumption that romantic relationships were short-lived, but no specific data were cited (Belsky et al., 2010).

In their updated study, Belsky and colleagues predicated a causal model to better understand BSD theory, in which the first construct causes the second, the second causes the third. They predicted the causal path to be as follows, harsh maternal parenting in part caused early pubertal onset which in turn influenced risk taking in sexual behaviors and engaging in other risk taking behaviors including substance use, theft, and physical aggression. They tested their model with for 14-15 year old adolescents. Belsky and colleagues acknowledged several previous research studies by other researchers which provided evidence for a positive association between early maturing females and their substance use and delinquent behaviors. The 1364 families in this study were part of a larger study, which recruited participants from hospitals all over the United States. Those excluded from participation were families where the mother was aged 18 or younger, non English-speakers, those who presented with illnesses or substance abuse, families with twins, families whose babies had birth complications, and families which lived in unsafe neighborhoods or neighborhoods far from the study sites (Belsky et al., 2010).

The researchers investigated maternal harshness when children were aged 4.5 via a self-report questionnaire of parenting strategies. They measured start of puberty yearly during physical exams from age 9.5 to 15 and risk taking behaviors when the child was 15 via a survey. Via a path model the researchers found support for BSD theory in that maternal harshness predicted timing of pubertal onset and pubertal onset influenced only sexual risk taking behaviors, but not other risk taking behaviors. These findings held for all participants regardless of diverse ethnic backgrounds including African-American, Latina, and Caucasian. They interpreted their findings to mean that early maternal harshness indirectly affects sexual risk taking behaviors, via onset of puberty, and not other risk taking behaviors (Belsky et al., 2010). From an evolutionary perspective, this finding makes sense because one should only engage in risk taking behaviors that may lead to reproductive success.

Another longitudinal study investigated whether neighborhood characteristics moderate the relationship between caregiver affect towards their adolescent and the adolescent's sexual debut and amount of sex partners. Gardner, Martin, and Brooks-Gunn (2011), predicted that neighborhood conditions including neighborhood violence and community poverty may contribute to adversity for an adolescent and amplify the relationship between caregiver hostility and adolescent early sexual debut and number of partners. Researchers had a sample of 1070 10-15 year old adolescents living in Chicago. They measured sexual behavior via a self-report questionnaire. Gardner and colleagues measured caregiver hostility via the Conflict Tactic Scale (Straus, 1979). They investigated neighborhood socioeconomic characteristics via the 1990 Census data. Results indicated that parent hostility predicted adolescent early sex debut and multiple sex partners after 2.5 years. Results also indicated that neighborhood disadvantage

strengthened the relationship between parent hostility and adolescent sexual behavior (Gardner, et al., 2011).

Mating Effort and Aggression

The relationship between mating effort behaviors and aggressive and delinquent behaviors indicates that antisocial behavior may enhance reproductive success (Lalumiere et al., 2005; Quinsey, 2002). Lalumiere and colleagues reported that because of the conspicuous nature of the relationship between antisociality and mating effort, the relationship between these two constructs is rarely closely examined in research (2005). It is first necessary to parse out how antisociality, as a personality characteristic, and delinquent behaviors may separately relate to mating effort. Of note, Quinsey highlighted differences between people who engage in delinquent behaviors and people who possess the personality trait of antisociality. He reported that findings suggest that individuals who engage in delinquent behavior in adolescence begin to discontinue using these behaviors during early adulthood. These individuals use the delinquency as a mating effort strategy when they have a competitive disadvantage compared with same sex competitors. Whereas antisocial individuals express antisocial behaviors and attitudes at a younger age, with more persistence, and likely there is a neurological and genetic component to their antisocial personality trait (Quinsey, 2002, p. 9). Therefore, it is noted by Quinsey (2002), that delinquency is viewed as a separate, but related construct to antisociality.

Other researchers indicate differing causal influences of the two constructs of delinquency and aggression. Research on the Achenbach System of Empirically Based Assessment (ASEBA) indicated that scores on the Aggressive Behavior subscale were greatly influenced by genetic factors, whereas scores on the Delinquent/Rule-Breaking subscale was impacted by both genetic and environmental variables (Achenbach & Rescorla, 2007). These

researchers indicated that aggressive behaviors, like antisocial traits, are more influenced by genetic indicators, whereas delinquent behavior is influenced by environmental factors. While they are not the same construct, they measure similar aspects of human antisocial behavior. In the section that follows, literature was reviewed that examined a relationship between antisocial, aggressive, or delinquent behaviors and mating effort.

Other researchers have investigated the connection between mating effort and aggressive and/or antisocial and delinquent behaviors. A benefit of understanding this relationship is to possibly uncover reproductive motives for being aggressive towards other humans. A review of past and current research provides evidence, which suggests that aggressive and delinquent behaviors are used as strategies in mating effort to access and protect mates. From this a possible inference can be made that aggression towards others, especially same sex competitors, may be strategic in acquiring mates. Thus it may explain why humans are aggressive towards others in particular social situations. Egan and Hamilton summarized this main argument of the relationship between aggression and mating effort strategies. They wrote, “Classically, aggression seen in some bars and clubs reflects hostilities breaking out between males (and females) competing for the same finite pool of potential partners, whereby both sexes intra-sexually compete for mates with higher status and greater perceived mate value” (Egan & Hamilton, 2008, p. 371).

Rowe and colleagues assessed the relatedness between delinquency and mating effort in 116 adolescents. They analyzed adolescents (mean age = 16.8) who were part of a larger study as well as their siblings, in order to gain understanding about familial traits. The inclusion criteria for the participants were that they had a history of delinquent behavior and siblings who had a history of drinking alcohol. The researchers collected information regarding participants

mating and delinquent behaviors via coming to their home and having the participants fill out surveys (Rowe et al., 1997).

The researchers theorized that antisocial behavior, namely delinquency, was an adaptive reproductive strategy. Mating effort was measured by the total score on a scale made specifically for this research project. It consisted of 10 items, each with 5-point Likert scale response options. Reliability was reported as adequate for males ($\alpha = .79$), but fair for females ($\alpha = .63$). Social failure was measured by participants' average grades in school and attitudes about school (e.g., school spirit, joining school clubs), and the "life events failure scale" adapted from another scale. Delinquency was measured by a 20 item, self-report scale used in an earlier phase of the study. It included the behaviors of vandalism and trespassing, aggression, theft, lying, speeding, and defiance towards adults.

Rowe and colleagues hypothesized that antisocial behavior may increase reproductive success in that the use of aggression may help to successfully win a competition against an opponent in acquiring a new mate or in retaining a current mate. To make this argument they posited an "if-then strategy", if an individual fails in the social context with peers and others, and then he/she must start to use more aggressive and antisocial mating-effort strategies, such as jealousy in mate guarding. Their first hypothesis based on this "if-then strategy", was there would be no relationship between delinquency and mating effort when controlling for 'social failure'. The idea was that competence in social situations was needed in order to have success in intrasexual competition. Failure in social situations would lead to low or no success in intrasexual competitions for potential mates (e.g., not acquiring valued resources, or lack of success in derogating competitors). In turn this would lead to the use of more aggressive and delinquent mating effort strategies to acquire mates. In summary, the correlation between

delinquency and mating effort behaviors is conditional upon one's success in his environment. Specifically, Rowe and colleagues predicted that if one lacks competence in social settings they will have higher rates of mating effort and higher rates of delinquency and named this trend the conditional strategy (Rowe et al., 1997). They did not find support for conditional strategy. Reported delinquency and mating effort maintained a strong, significant relationship after social failure was accounted for in their statistical analyses. This implied that participants' failure in social situations is a result of their use of mating effort and delinquency as the researchers found, and not vice versa as they had predicted (Rowe et al., 1997).

The researchers also offered an alternative hypothesis, that mating effort was a heritable trait, and not a response to one's environment (as stated in the first hypothesis), and this was the impetus for the researchers to collect information regarding same-sex siblings' mating effort and delinquent behaviors. They did not include subjects who had opposite-sex siblings. The researchers explored the heritability of mating effort and delinquency by comparing these traits in participants and their siblings. They predicted that mating effort and delinquency would not run in families. However, they found that both delinquency and mating effort were correlated for participants and their siblings, providing evidence that they may be heritable traits. For brothers, the younger brothers' self-report delinquency was positively correlated with their older brothers' delinquency, $r = .46, p < .05$ and with his older brothers' mating effort total score, $r = .27, p < .05$. The younger brothers' mating effort correlated with their older brothers' reports of delinquency as well, $r = .29, p < .05$ as well as with the older brothers' mating effort $r = .16$, (p-value not reported). For females, similar relationships existed, though had weaker correlation coefficients, and authors did not report significance levels for females. However, authors noted that they did not collect genetic samples and therefore did not find a direct genetic link. They

concluded that environmental factors may have been able to explain the relationship found between siblings and participants' delinquency and mating effort.

For hypothesis three, Rowe and colleagues predicted that participants with low mate value would put forth more energy in mating effort and possibly turn to delinquent behaviors to access and compete for mates than those with high mate value. The researchers referred to mate value in this study as the characteristics which one possesses that are desirable characteristics to other mates. They pointed out examples of such characteristics: earning a high-income, wanting to provide parental investment for offspring, and physical attractiveness. They measured this construct via asking participants to rate themselves on three characteristics using a 4-point Likert scale. For males, this hypothesis was not supported. Physical attractiveness in male participants was correlated with mating effort, $s = .24, p < .05$ thus males with higher mate value measured by attractiveness were also engaging in more mating effort than less attractiveness males. However, the hypothesis had some support for the females. Females who reported a lower desire to invest in their offspring had higher mating efforts than females with higher desire to invest in their offspring, $r = .24, p < .05$. Lower parental investment is considered undesirable and therefore lowers one's mate value (Rowe et al., 1997). More research is needed to uncover the specific strategies used by females of high and low mate value and whether type of mating effort strategy used is influenced by females' mate value.

Other studies have found a positive correlation between mating effort and delinquency. Charles and Egan (2005) studied 564 adolescents attending a Scotland school, ranging in age from 12 to 15.9. Participants in their study completed surveys regarding their mating effort and aggressive behaviors. Charles and Egan predicted that there would be a significant, positive correlation between the variables of mating effort and self-reported delinquent behaviors. They

hypothesized that this relationship would hold true for both male and female participants. They measured delinquency via the Self Report Early Delinquency Instrument (SRED; Moffitt & Silva, 1988, as cited in Charles & Egan, 2005). They changed the Likert scale from the original measure so response choices were 0, never engaged in the behavior, 1, engaged in the behavior once, or 2, engaged in the behavior more than once. They conducted factor analyses to come up with five delinquency categories (eigen value ≥ 1.7 , accounting for 45.2% of variance) based on the scale (Charles & Egan, 2005, pg. 1040). Factor 1 was comprised of antisocial behavior, fighting, destruction of property, getting suspended or expelled, and carrying or using a weapon. Factor 2 was alcohol-vandalism, such as consumption of alcohol, graffiti, and damaging property. Factor 3 was transgressive behaviors, which included a continuum of 'serious misbehavior' including prank calls and cursing in public to illegal acts, including fare dodging and trespassing. Lastly, Factor 5 was criminal behavior, which included stealing a vehicle and breaking and entering. Researchers in this study adapted the 10 item Mating Effort Scale from Rowe and colleagues, discussed above (Charles & Egan, 2005).

Charles and Egan (2005) found that males scored higher on the Mating Effort Scale than females in their study ($t(523) = -4.25, p < 0.001$). Also, they found that mating effort had a significant, positive correlation with all five factors of delinquency. The highest correlation among the factors was a moderate correlation between mating effort and antisocial behaviors ($r = .50, p = 0.001$), next, both alcohol-vandalism and transgressive behaviors ($r = .44, p = 0.001$), lastly theft and criminal behavior ($r = .32, p = 0.001, r = .28, p = 0.001$; respectively). They found these significant relationships between delinquency subscales and mating effort to hold true regardless of gender. Lastly, the researchers found evidential support that age was positively, significantly correlated with mating effort, though this correlation was modest ($r =$

.13, $p = 0.001$). They also found a trend that delinquency increased with age into later years of adolescence (Charles & Egan, 2005).

Charles and Egan reviewed the implications and interpretation of their findings. They argued that the moderate, significant relationship between antisocial behaviors and mating effort suggests that antisocial behaviors may be specifically used for reproductive success and intrasexual competition with same-sex competitors. Behaviors such as hitting others, fighting in the streets, and carrying a weapon can be ways in which one elicits dominance, mate guarding, and strong competition against others. Also the behaviors of breaking windows and vandalizing cars can be considered purposefully destroying a competitor's material resources, as to make them seem less desirable to opposite sex mates (Charles & Egan, 2005).

Gender differences in mating effort strategies and aggression. Many researchers have analyzed aggressive mating behavior for one gender or the other because there is strong evidence that the aggressive tactics used by each gender are different and a given tactic may have differing effects on mating success for each gender. In the review of the literature that follows there is an emphasis on females' aggressive mating strategies as there is less research devoted to this population. Males' aggression in intrasexual competition will be briefly summarized.

Male aggressive mating tactics. The relationship between aggressive behaviors and mating effort strategies is well established for males (Capaldi, Stoolmiller, Clark & Owen, 2002; Lalumiere et al., 2005). It has been theorized that for males, some aggressive acts and delinquent behaviors are considered competitive mating effort strategies. Quinsey noted, "The idea that the behaviors involved in delinquency are a manifestation of mating effort and inter-male competition is supported by the correlation between degree of delinquency and the likelihood of fathering children at a young age" (2002, p. 3). Geary (2010) reported the main motives

regarding male competitive aggression are to acquire resources to support mates and offspring as well as to determine and uphold social status. He also reported that male against male aggression has been known to occur more frequently in more primitive societies such as hunter-gather, and agricultural societies. By comparison, more modern societies have less homicide due to male on male aggression than do the primitive societies. He theorized that perhaps the cultural trend of monogamy may help explain why there has been less male same-sex aggression in competition for mates. He commented that in the cases that male aggression does lead to homicide, the cause of the initial combat is usually associated with jealousy about mates or protecting one's social status (Geary, 2010).

Female aggressive mating tactics. Campbell investigated how access and availability to resources affects the intensity with which females compete. She discussed the changes that have occurred for women in modern society in which women sometimes have to choose work over child rearing or vice versa. She also reported differences between working class mothers or soon to be mothers and those of the middle and upper classes. Women in the lower economic class and ethnic minorities have fewer resources to be able to work and raise children, and also have higher rates of single parenting. Female on female violence has been analyzed in order to collect information regarding patterns and trends. Campbell researched these trends and found evidence provided by the Bureau of Justice Statistics that a majority of crimes committed by females were perpetrated against other females. Specifically, women aged 15-24 usually assault other women of the same age group. The settings in which these assaults frequently occur are at restaurants and bars that serve alcohol and on the streets. This lack of resources may cause women of low socioeconomic status to fight physically, using more aggressive tactics. Women, who may prefer in general to use indirect competitive tactics might adopt direct aggression to compete

when resources are scarce or there are a limited number of desirable suitors. Campbell noted, “Among the very poorest sections of society, the intensity of competition for ‘good’ men drives young women from display and gossip to outright attack” (Campbell, 2004, p. 23).

In 1995, Campbell researched her hypothesis that aggression peaks during adolescence due to its functional use of a strategy in obtaining mates. It was predicted that adolescent aggression increases during the time period at which they begin to explore and become interested in mating effort and during a time where mate selection processes occur. She predicted that female on female aggression occurs when there are less “good mates” available (i.e., mates with high mate value), so female competition becomes more intense. She reported that, for instance, the high mortality rate for young African-American males should spur on more intense female competition for mates. Also, she reported that there should be more intense female-female aggression in environments that are plagued with high rates of unemployment, homicide, incarceration, substance abuse, and mental disorders. In these environments there are fewer men who have high mate value and therefore less available resources and ability to provide for mothers and offspring (Campbell, 1995).

Campbell reviewed her previous qualitative and quantitative studies to investigate these hypotheses. She utilized various populations including British teens in a study of 251 females. In this study she found that 46% of fights started because of “attacks on personal integrity. This category included accusations of promiscuity, false accusations, and gossiping behind her back” (Campbell, 1995, p. 113). In a second study, she analyzed 64 female gang members in New York City. In this study, she found that the second most frequent reason for fighting (24% of female aggression) was based on protecting one’s possibly stained reputation. These fights were usually female versus female in nature. These data suggest that most fights among females were

related to sexual competition or mate guarding. In summary, Campbell noted three main causes of female on female aggression. The girls were the monitoring and protecting reputation and rumors spread regarding sexual activity; competing over scarce mates with high mate value and valuable resources; and guarding a mate from female competitors who pose a threat to the stability of a relationship with a romantic partner (Campbell, 1995).

Relational aggression. Campbell examined specific competitive tactics that were aggressive in nature in a female population. She described her theoretical framework and her view of female aggressive competition, “The present article sees competition as an inherent part of our biological status and women’s lesser willingness to escalate competition to direct aggression as arising out of their particular biology rather than from conformity to cultural expectations of femininity” (Campbell, 2004, p. 16). She explored the possible reasons that may explain why women engage in less overt aggression in competition for mates than the amount of aggression in which males engage. She reported one traditional view is that women do not need to go to such great or harsh lengths to compete because males are willing to copulate in a promiscuous manner.

Another view that may explain the gender differences in aggressive competition is that aggressive combat may be more costly for women in terms of their reproductive success. If a woman puts her life at risk it may induce stress during the gestation period. Risking one’s life may put a female’s previous offspring at risk of harm as well (Campbell, 2004; Charles & Egan, 2004; Geary, 2010).

Campbell also commented that women are less likely to engage in risky behaviors, possibly due to the anxiety involved in risk taking. She cited empirical research which reported that women have higher rates of anxiety disorders, which may relate to desiring to take less risks

compared with males. Females may weigh the costs and benefits of engaging in physical combat, and view it as more risky than males (Campbell, 2004). Still other researchers believe that the use of physical aggression in intrasexual competition may threaten a female's social status, as research demonstrates that females look poorly upon female acts of physical aggression (Crick, Bigbee, & Howes, 1996).

Campbell inferred that one way women avoid risking their lives in physical aggression in intrasexual competition is by engaging in covert, relationally aggressive tactics (2004). These behaviors are not as risky for a female to engage in because they do not involve direct physical combat and therefore may not induce anxiety (Campbell, 2004). Relational aggression has many pseudonyms in the literature, and these terms will also be included in the discussion on relational aggression as mating tactics: covert aggression, indirect aggression, and social aggression. Tactics falling under relational aggression include spreading rumors about same sex competitors, gossiping, ignoring, and excluding other females from social interactions with peers (Campbell, 2004). Relational aggression may also include manipulating peers and friends within one's social circles to also ostracize a competitor (Geary, 2010). Studies have indicated that relational aggression is more common in females than males. Studies have also demonstrated that this relational aggression can be effective because the aggressor can remain anonymous via strategically influencing peers to also engage in relational aggression against the aggressor's competitor for mates (Geary, 2010; Leenaars, Dane, & Marini, 2008).

These relational aggression tactics have been examined in many empirical studies. There is empirical support that women engage in these behaviors as mating effort strategies and do so significantly more than men (Buss 1988; Buss & Dedden, 1990; Geary, 2010; Leenaars et al., 2008; Walters & Crawford, 2004). Buss and Dedden examined relational aggression as an

intrasexual competitive strategy, and coined the term for these aggressive strategies as ‘competitor derogation’ strategies. They prompted 120 undergraduate subjects, half male, to report what they would do to make competitors seem like a bad mate choice or undesirable to suitors. Their findings indicated that women statistically more than men used the strategies of “call competitor promiscuous”, “derogate competitor’s appearance”, “call competitor a tease”, and “question competitor’s fidelity” (Buss & Dedden, 1990). Geary also reported that these subtle tactics can include women denigrating other women’s physical traits and attractiveness or lack thereof (2010). Specifically, women may use gossip and rumor spreading to share messages with their male suitors that their competitors are overweight, ugly, and have wrinkled faces (Buss & Dedden, 1990). There is also empirical support that relational aggression can lead to success in dating and mating. Research has demonstrated that indirect aggression via self-report was positively associated to number of romantic partners and negatively related to the grade when females reporting getting their first boyfriend (Vaillancourt et al. 2003a as cited in Leenaars et al., 2008).

Relational aggression is a commonly used method of intrasexual competition for female adolescents. Geary (2010) theorized that relational aggression becomes the substitute for overt aggressive behaviors when a child or adolescent realizes that her overt aggression is socially inappropriate and she may weigh the costly consequences of overt aggression as too high (i.e., school suspension). In adolescence these strategies are used directly to compete for mates or dates.

Gossiping about a competitor and spreading rumors to peers can serve two agendas for the aggressor. One aspect has been described above, and that is putting down a competitor to peers and suitors. The other is self-serving in nature; in that the aggressor belittles the victim of

the relational aggression for characteristics or behaviors the victim has, does or has done. Logically the aggressor should only make fun of someone for behaviors that the aggressor herself does not do. In this way, by putting someone else down, the aggressor is able to highlight a desirable characteristic she has, or demonstrates that she does not engage in a negative behavior by pointing out the victim's undesirable characteristic or negative behaviors (Campbell, 2004).

In their study of adolescent indirect victimization, Leenaars and colleagues (2008) investigated the extent to which relational aggression was used as a strategy of intrasexual competition in a population of 2319 students (56% female) from 25 high schools in Ontario, Canada. They inferred that if relational aggression is a strategy used in mating effort, then females considered as threats or rivals would be the most likely to be victimized by other females. They predicted that this relationship would not hold true for males because males do not regularly use relational aggression as a mating strategy. They defined peers who were 'targets'/competitors if they had the following characteristics: physical attractiveness, a history of dating and sexual activity, and success in attracting several suitors. They measured the indirect victimization via adopting a scale that already existed and altering it to fit the purposes of their study. The questionnaire included items which asked if participants had received threatening or hurtful letters, been excluded from activity, and if rumors had been spread around about them. They measured sexual behavior via Likert scale items, which tapped into quantity of past and recent sexual behavior. Dating behavior was measured by a 0-7 Likert scale item, which asked how frequently participants dated. They measured attractiveness via asking participants to endorse a Likert scale from 1-4 of how good looking they viewed themselves to be (Leenaars et al., 2008).

Leenaars and colleagues' hypothesis was supported by the finding that females who reported themselves to be highly attractive were also more likely to report experiencing significantly higher levels of indirect victimization than those that reported they were less attractive. The researchers calculated that one's self-reported attractiveness increased the odds significantly by 35% for being indirectly victimized. They also confirmed their predictions on gender differences, in that attractiveness for males significantly decreased the chances of indirect victimization by 25%. They explained that females do not put as much emphasis on physical appearance in their mate preferences, so attractive men are less of a threat to unattractive men. Not all hypotheses were supported: dating frequency, a measure of mate success, was not associated with indirect victimization. Researchers in this study supposed there would be a significant relationship here because humans should be more competitive towards a same-sex competitor who has mating success (high dating frequency), though this was not found. The researchers indicated that their measure of dating may not have directly tapped into mate success. Some teens think of 'group dates' when responding to this item and not necessarily their personal success of going out with a member of opposite sex to whom they are sexually attracted (Leenaars et al., 2008).

Leenaars and colleagues reported that research demonstrates that promiscuity is considered to be an undesirable trait. Specifically, the researchers believed that only past sexual behavior would be positively associated with indirect victimization, not recent sexual behavior because past behavior can signal a history of success in mating, whereas recent sexual behavior may signal promiscuity. This was not validated in their study because one's report of past sexual behavior was not significantly related to indirect victimization, though, conversely, recent sexual behavior was related to indirect victimization for older adolescents only. This may be because

indirect victimization was not used as a competitive mating strategy, but as a means of rejecting those females viewed as promiscuous, as promiscuity can be viewed as socially unacceptable (Leenaars et al., 2008). Also, promiscuity is viewed as undesirable from an evolutionary perspective because men parental uncertainty and therefore nonpromiscuous females are viewed by males as those who can be trusted to refrain from engaging in sexual relationships outside the partnership.

Lastly, Leenaars and colleagues hypothesized that they would find more intrasexual competition among females as the percentage of females dating and engaging in sexual activity increased, providing support for the idea that indirect victimization is used as a mating strategy for females. This hypothesis was not supported in their research, though it has been reported in previous research. The researchers commented that this could be due to the fact that they used the term 'dating' in their questionnaire, which may not have tapped into the construct they had hoped to measure (Leenaars et al., 2008). In summary, Leenaars and colleagues demonstrated in a group of adolescents that indirect victimization was used as a mating strategy, specifically females targeting females who had high mate value based on several characteristics including dating history and physical attractiveness.

Mating Effort and Attractiveness

There is very little research, which investigates the direct relationship between mating effort strategies and mate value. In light of this, research that investigates physical attractiveness, an essential aspect of mate value, and its relationship to mating effort is reviewed. Past literature suggests there is a significant relationship between mating effort and physical attractiveness. Facial attractiveness may be viewed as an aspect of one's mate value and is often

used as a measure of mate value (Rowe et al., 1997). Also, physically attractive individuals have greater success in mating with the opposite sex than unattractive individuals (Rowe et al., 1997).

Campbell noted that men put more value on the attractiveness of their possible mates than women because female attractiveness is considered a signal of being young and of high capability of procreating (2004). This conclusion has also been found in survey research. Buss and Schmitt asked a sample of 44 men and 42 women to rate a list of undesirable characteristics on a Likert scale on their undesirability (1993). They found that men had a stronger dislike for unattractiveness in their short-term mates. Men in their study also considered unattractiveness significantly more undesirable than women in both short and long-term mating. Conversely, Buss and Schmitt found that both genders in the study prioritized physical attractiveness when in pursuit of short-term mates, though men had a higher, statistically significant preference for physical attractiveness than females in the study. Men in the study also had a stronger proclivity to choose attractive females when seeking short-term mates versus long-term mates (Buss & Schmitt, 1993). It has also been noted that there are specific features that make up a female's attractiveness that appeal to men. Specifically, attractive facial characteristics include shiny hair, unwrinkled skin, large eyes, small nose and full lips (Etcoff, 1999, as cited in Campbell, 2004).

It is suggested by many theorists that one of the main competitive strategies women employ is that of improving their attractiveness (Buss, 1988a; Buss, 2009). For instance, "in the United States, 88% of women over the age of 18 wear makeup designed to correct asymmetries, signal sexuality, and mimic youth" (Etcoff, 1999, as cited in Campbell, 2004, p. 19). The maintenance of and improvement of attractiveness may be considered a mating strategy and such examples include cosmetic surgery, dressing a certain way to flaunt desirable body features, and styling one's hair and makeup in specific ways that are viewed as most attractive. It is clear via

several research studies that attractiveness plays an integral role in mating effort strategies, especially for females (Buss, 1988a; Buss, 2009; Buss & Schmitt, 1993; Campbell, 2004).

Several inconsistent hypotheses exist regarding the relationship between attractiveness and mating effort. Campbell predicted that it is rare for extremely attractive women to compete aggressively with other females for mates or dates. She reported that this is because “...(1) their probability assessment of successfully attracting a mate would be realistically higher and the attractions of risky strategies consequently lower, and (2) their larger number of suitors would offer ample choice within which to secure the best mate” (Campbell, 1995, p. 112). She predicted however, that more attractive females are the victim of more aggression than unattractive females, which was corroborated in Leenaars and colleagues’ findings, discussed above (Campbell, 1995; Leenaars et al., 2008).

In their study, discussed above, Rowe and colleagues found that for their male adolescent and young adult subjects mating effort was positively correlated with attractiveness ($r = .24, p < .05$). This contradicted with their hypothesis that low mate value, as measured by low self-perceived physical attractiveness, would be positively associated with mating effort. They suggested an explanation for this finding, “The lack of association of mate value with mating effort can be explained if different mechanisms underlie them... physical appearance may reflect heritable bone and tissue structures. Unless genetic pleiotropy occurs, the genes influencing these different traits would assort independently” (Rowe et al., 1997, p. 112). Genetic pleiotropy is when one specific gene affects multiple phenotypic characteristics, in this case, the characteristics being attractiveness, as a measure of mate value, and mating effort. The authors suggest that perhaps the heritable traits of attractiveness and mating effort originate from different genes and therefore it is more difficult to demonstrate a relationship between the two

(Rowe et al., 1997). Another explanation for the contradictory finding regarding the relationship between mating effort and physical attractiveness is that Rowe and colleagues measured self perceived physical attractiveness. It is possible that if external perceptions of one's attractiveness were correlated with mating effort, that Rowe and colleagues may have found supporting evidence for their hypothesis that attractiveness was inversely related to mating effort. Another explanation for this lack of finding may be that there are other variables affecting the relationship between mating effort and mate value, such as environmental influences, that may influence both mating effort and characteristics that are desirable in a mate (e.g., adverse family background).

Dion, Berscheid and Walster (1972) investigated college students' perceptions of attractiveness and mating success. They recruited 60 freshmen college students in an introductory psychology course, half of which male and half female, to participate in their study. Each subject was given three photos to examine and then asked to answer questions regarding the person in the photo. The three photos were of people all the same sex and approximately the same age as the subjects. Different subjects were randomly given all male, or all female photos, regardless of sex of subject. The researchers created 12 sets of photos. One of the photos was of a physically attractive person, one was a person of average attractiveness, and one photo was of a person who was unattractive (Dion et al., 1972).

Dion and her colleagues predicted that the photos of attractive people would be more likely to be rated as socially desirable by subjects as well as to have greater success in many arenas, such as occupation. The researchers confirmed that the people in the photos who were more attractive were predicted by subjects to have more prestigious jobs than the photos of people of average attractiveness and unattractiveness. They also predicted that subjects would

predict that the attractive people would have had greater mating success and happiness in marriage than unattractive individuals. This was also confirmed. This was also the case for attractive versus average attractive individuals except for the case of happiness. For happiness, participants predicted that attractive and average attractive individuals had the same happiness, which was significantly higher than the happiness of unattractive individuals. Subjects rated the attractive photos to have more happiness in marriage and have more competent spouses than photos of people who were less attractive and those who were had average attractiveness. Subjects also rated more attractive individuals as being more likely to acquire an 'acceptable partner' than the photos of less attractive individuals. It was also found that more attractive people were predicted by subjects to get married younger and remain single less frequently than unattractive people (Dion et al., 1972). This study provides evidence that when undergraduates considered only the characteristic of physical attractiveness, they assumed that those that were more attractive were more likely to have success in their mating effort, were more likely to have this success at a younger age, and were more likely to have mates with higher mate value (i.e., competent spouses, 'acceptable partners').

Mating Effort and Risk Taking Behaviors

Research demonstrates a relationship among risk taking behaviors and mating effort. Risk taking can be conceptualized as behaviors, which may lead to high benefits and/or high costs, such as gambling, vandalism, carrying a firearm or other weapon, and drug and alcohol consumption (Wilson & Daly, 1985). Geary proposed that individuals who engage in risky behaviors do so while predominantly thinking about the benefits, rather than the costs of the risk. Geary reported that the research regarding differences between sexes on frequency of risk taking behaviors is inconsistent. He reported though, that across the literature, it seems that men engage

in more risky behaviors than women because women give more consideration to the costs and benefits of taking the risk than males (Geary, 2010). This is consistent with Campbell's views on risk taking behaviors and anxiety in females (Campbell, 2004). Also, Quinsey (2002) asserted that males are predicted to be less 'risk-averse' than females (2002). There may be a biological explanation for why males engage in risky behaviors. Campbell noted, "...psychopharmacological studies suggest that men's willingness to engage in risky and dangerous behaviors may be mediated not by incentives but by an absence of inhibition. The neurotransmitter serotonin is implicated in behavioral inhibition and low levels have been linked to impulsive killings and suicide" (Campbell, 2004, p. 18). Lalumiere and colleagues found that when they examined risky behaviors specifically during the time period of adolescence, females were also likely to engage in aggressive and delinquent behaviors during adolescence, though they are less violent than males (2005). Female risk taking behaviors during adolescence were also noted by Campbell. She reported that crime rates go up for both sexes during this developmental period, which can in part be attributed to both sexes being willing to take more risk (Campbell, 1995).

Another way to examine risk taking behaviors is that some competitive mating behaviors fall under the realm of risk taking behaviors. For instance, people who are more likely to engage in a competitive behavior may have a higher probability of winning a competition with another suitor for a mate, versus the person who decides not to engage in competition because the risk may be viewed as too high (Geary, 2010). Using a 2 by 3 factorial, within subjects experimental research design, Ermer, Cosmides, and Tooby (2008) examined when young people would be more likely to engage in risk taking behaviors. They recruited 94 undergraduate students to participate in their study, 42 of them were male, mean age was 19.6. They found that male, but

not female participants, were more likely to make risky decisions when resources were up for grabs and when they were in competition with rival with whom they had a similar standing in social status. Geary also reported that men are likely to engage in risky behaviors if these behaviors will promote a male's social status to attract more opposite sex mates (2010). He also theorized that women are more attracted to men who engage in risky behaviors (Kelly & Dunbar, 2001). This would provide incentive for men to engage in risky behaviors, if being viewed as 'more risky' is considered appealing to women. Evidence for this idea is that across age groups, risk taking behaviors are more likely to occur when there is an audience close by (Geary, 2010).

The theoretical link between risk taking behaviors and competitive mating effort strategies has been discussed widely in the literature. Wilson and Daly explained their inferences relative to the relationship between mating effort competition and risk taking behaviors, "If male fitness derives from success in risky competition, then males are expected to join such competition willingly, given reasonable prospects of success" (1985, p. 66). They concluded that the reason risk taking occurs as a mating effort strategy is to display strength and engage in what they referred to as 'honest advertising' (Wilson & Daly, 1985, p. 66). The thought is that if one wants to display that they are willing to challenge a competitor, what better way to do that than to engage in the risky behavior of actually challenging the competitor, as opposed to just verbally saying they are capable of doing so. Wilson and Daly inferred that with risk taking and success in risk taking comes prestige and this prestige is a desirable quality in a mate (1985).

Wilson and Daly also tried to understand the phenomenon that from late adolescence to young adulthood, males engaged in risk taking behaviors and also fiercely competed for mates (1985). They recognized that mating effort competition and risk taking behaviors both spiked

during this developmental time period and coined this time of life ‘young male syndrome’ (Wilson & Daly, 1985). Also, there is heightened competition during this time as adolescents go through puberty and become physically stronger and more aggressive. “In late adolescence – early adulthood men are exposed to the most intense competition. At this age, young men are maximally attracted to risky activities...” (Lalumiere et al., 2005, p. 189).

While Wilson and Daly referred to the relationship between risky, aggressive behaviors and increased mating effort as a ‘syndrome’, it may be a developmental pathway instead. Not all boys who have Young Male Syndrome meet clinical criteria for a syndrome or disorder. For the purposes of this study, the traits that comprise the profile for girls who have risky, aggressive behavior and increased mating effort will be referred to as a pathway or trajectory as opposed to a ‘syndrome’.

A catalyst of the ‘young male syndrome’ found in the literature is perceived or actual low success in mating effort or having ineffective mating effort strategies. Lalumiere and colleagues stated, “High intensity of competition, low success, and perception of poor future prospects lead to more risky and dangerous activities” (2005, p. 87). Therefore, those adolescents or young adults who feel that they are at a competitive disadvantage in their mating resources and characteristics may be more likely to engage in risky behaviors.

Lalumiere and colleagues made other observations regarding the young male syndrome. They examined what occurs after males grow out of emerging adulthood (e.g., when they move on from their young male syndrome). Data show that once men advance through emerging adulthood their risk taking behaviors and delinquency tend to fade. One possible explanation for this is that they mature, find a mate, and start to raise offspring, and therefore there is no need to engage in risky behaviors anymore. Lalumiere and colleagues summarized this evidence, “...

they switch from a risky, competitive, high-mating-effort mode to a less risky, high-parental-effort mode” (2005, p. 86). This provides evidence that during the time period of young male syndrome, there is a hallmark relationship of risk taking behavior and mating effort, because of the parallel times in which these two constructs peak (young adulthood) and fade away (adulthood).

Quinsey explained that research demonstrates that men who score higher on mating effort scales also report higher levels of sensation seeking behaviors than males who score lower on mating effort measures (2002). He did not make any comments regarding female risk taking behaviors and how they relate to mating effort, namely during adolescence and emerging adulthood (Quinsey, 2002).

Charles and Egan, discussed above, also found that one of the subscales in their aggression measure, the alcohol/vandalism subscale, was positively correlated with mating effort. This provided evidence that the data on adolescents who participated in their self-report study demonstrated a relationship between risk taking behaviors such as vandalism, alcohol consumption, and gambling with mating effort (2005). There were no significant differences between males and females as for both genders mating effort and alcohol/vandalism were positively related to one another (boys, $r = .44$ $p = .001$; girls, $r = .44$, $p = .001$). The relationship between vandalism and mating effort relationship may be related to adolescents’ desire to display an image of dominance (Charles & Egan, 2005).

Barlas and Egan (2006) investigated the risky behavior of carrying a weapon among teens in the European Union and specifically in the United Kingdom (UK). They noted that carrying a weapon is related to other risky behaviors such as using the weapon and substance use both in the UK and in the United States. In their review of the literature, they gathered that

weapon carrying may be viewed as a risk taking, mating effort strategy. Like Wilson and Daly (1985), Barlas and Egan inferred that it is those males who are at a competitive disadvantage who engage in risky behaviors such as weapons carrying. Those males may have a harder time acquiring monetary and social resources and thus turn to riskier behaviors to compete with same sex competitors for mates (Barlas & Egan, 2006).

In their study, Barlas and Egan set out to provide evidence that weapon carrying is used as a mating effort strategy. They predicted that for some young adults, weapons carrying would be viewed as 'cool' by the opposite sex and therefore made these young adults appear to have a high social status, which is a desirable quality in a mate. Thus, they predicted that weapon carrying would be positively related to mating effort (Barlas & Egan, 2006).

To study these hypotheses, Barlas and Egan recruited 121 subjects in Glasgow and England, 62 of them being males. They recruited participants from diverse organizations, including general education schools, a residential school, youth groups, and a criminal justice team. A majority of subjects were Caucasian and mean age was 15.73. The researchers created a measure of attitudes towards weapons for the purposes of their research. They used items from several different questionnaires measuring attitudes towards guns and thoughts relating to conflict. They also utilized the Mating Effort Scale created by Rowe and colleagues (1997) and modified by Charles and Egan (2005).

Barlas and Egan found that males were more likely to carry a weapon than females ($\chi^2 = 9.58, p < .002$). As found in previous literature weapon carrying was related to other delinquent behaviors, as measured by the SRED. They also found certain reasons for carrying a weapon loaded together significantly in factor analyses. Such items included: "looking cool, gaining other people's respect, feeling powerful, obtaining peer admiration, and weapons being carried

by friends and weapons be carried by members of one's family" (Barlas & Egan, 2006, p. 61-62). They named this factor as 'offensive weapon carrying'. They also found moderate support for the relationship between weapon carrying and mating effort ($r = .39, p < .001$). However, in a multivariate logistic regression model, mating effort was not a significant predictor of weapon carrying. The researchers concluded that, "While there is no direct evidence for high mating effort being a predictor of weapon carrying, it is proposed that arming oneself may still constitute a tactic used in intrasexual competition, as part of a general attempt to portray oneself as a risk-taker in order to attract mates" (Barlas & Egan, 2006, p. 69). In their discussion of their finding, Barlas and Egan noted that conducting a qualitative study with adolescents may shed more light on the direct relationship between the risk taking behavior of weapon carrying and mating effort, for this relationship may be more difficult to uncover via quantitative methods (2006).

Drug and Alcohol Use. Drug and alcohol consumption, which can be considered a risk taking behavior, has also been shown to be related to mating effort for both genders. Wilson and Daly (1985) speculated that alcohol use and mating effort may be linked by virtue of the fact experimentation with drug and alcohol by teens and young adults occurs in social settings with peers who admire the drug and alcohol use. Egan and Hamilton proposed that alcohol consumption may relate to aggression and mating effort (2008) through alcohol consumption's role in heightening aggression used to attract and compete for mates. Because intrasexual competition commonly occurs in environments in which alcohol is typically consumed, alcohol-related violence expectancies were associated with mating effort behaviors. Specifically, they predicted that mating effort be correlated with alcohol related aggression indirectly (Egan & Hamilton, 2008).

In their study, Egan and Hamilton recruited 95 subjects (56 being male) from a student union cafeteria. The subjects ranged in age from 18 to 45 with a mean age of 23.7 years. They measured alcohol related aggression via the Alcohol Related Aggression Questionnaire (ARAQ) which is comprised of 28 items divided into four subscales: trait aggression, alcohol related aggression outcome expectancies (i.e. "I drink deliberately to become aggressive"), sensitivity to pain and anxiety, high alcohol/low cost beverage lifestyles (McMurrin, et al., 2006, as cited in Egan & Hamilton, 2008, p. 373). They measured mating effort via the Mating Effort Scale (Rowe et al., 1997).

First, Egan and Hamilton looked at education as a predictor of alcohol related aggression. Fifty six of their 95 subjects spent a minimum of one year at college, while 39 subjects had not. They found that those subjects who had a year or more of higher education reported higher scores on the alcohol-violence expectancy subscale, trait aggression, and drinking inexpensive, but high-alcohol content refreshments ($F(1, 91) = 5.08, p = .03, F(1, 91) = 4.09, p = .05, F(1, 91) = 4.12, p = .05$, respectively). Secondly, mating effort scores had significant, positive, moderate correlations with all four subscales of alcohol related aggression (alcohol related aggression outcome expectancies, $r = .57, p = .001$, sensitivity to pain and anxiety, $r = .55, p = .001$, trait aggression, $r = .52, p = .001$, high alcohol/low cost beverage lifestyles, $r = .41, p = .001$; Egan & Hamilton, 2008).

Via hierarchical linear regression, the researchers found support for their hypothesis. Mating effort and being younger both predicted alcohol related aggression outcome expectancies and these variables accounted for 39% of variance of this subscale of the ARAQ ($F(5, 89) = 13.17, p < .001$). Similar findings held true for the other three subscales of the ARAQ with mating effort and younger age predicting them. However for the subscale measuring high

alcohol/low cost beverage lifestyle, age did not predict scores on this subscale, whereas mating effort did. They concluded from this that mating effort significantly predicted alcohol-violence expectancies for subjects in their study. They also reported that this finding was congruent with findings in other research studies relating alcohol consumption to mating effort. Lastly, the researchers commented on sex differences as they relate to these two variables. They reported that males reported significantly higher mating effort than females. They also reported that men had higher trait aggression. They said that use of alcohol and violence has increased rapidly in recent years and this should be explored further. This study provides evidence that the risky behavior of alcohol consumption is correlated with one's mating effort strategies and ability to engage in intrasexual competition. The researchers noted that bars as a setting may induce this relationship as they are places in which people are provoked and want to respond so that others view them as having high statuses (Egan & Hamilton, 2008).

Other studies have provided evidence for the relationship between mating effort behaviors and risk taking behaviors. Capaldi and colleagues (2002) measured the relationship between sexual behavior and drug and alcohol use. Drug and alcohol use was measured by self reported frequency and quantity of four substances: tobacco, alcohol, marijuana, and other drugs. They predicted that substance use predicted sexual behaviors in their male population and the results supported this hypothesis (Capaldi et al., 2002). Also, in their study of heterosexual men, discussed above, Lalumiere and Quinsey found that mating effort was related to sensation seeking (1996).

Lalumiere and his colleagues cited other research studies that demonstrated the positive relationship between risk taking behaviors and mating effort. They reported that Fagot and colleagues followed a cohort of 206 boys in a longitudinal study, the Oregon Youth Study

sample, beginning at age 9. The researchers found that those adolescents who fathered a child were more likely to have substance abuse problems than the adolescents who had no children (Fagot, Peers, Capaldi, Crosby and Leve, 1998, as cited in Lalumiere et al., 2005). Also, there is an association between “early onset sexual activities or number of sexual partners and criminality, drug use, and sensation seeking” (Ellis & Walsh, 2000, as cited in Lalumiere et al., 2005) as well as accepting risk and being more inclined to like dangerous activities (Lalumiere et al., 2005). Also, based on Charles and Egan’s study (2005) and Campbell’s qualitative research (1995), there is a relationship between mating effort and risk taking behaviors in females, though this population is rarely studied in this context.

Conclusion

The review of the literature demonstrates that there are several types of mating strategies, which adolescents and young adults utilize. Researchers have empirically categorized the most popular, most frequent, and most successfully used strategies. The literature has dichotomized competitive strategies into indirect competition, such as protecting one’s social status, and relational aggression, commonly used by females, and direct competitive behaviors, such as physical combat typically used by males. The research has also indicated that there are several personal factors that influence when and how these strategies are used. Factors include personal traits and behaviors, such as one’s own mate value and resources possessed, aggression, and risk taking behaviors. There are also external factors that influence strategies, such as the number of suitors available for mating, adverse familial and environmental factors, and how potential mates react to the mate strategies.

In addition to competitive strategies, mating strategies that directly emphasize one’s mate value have been identified. These include trends in the literature suggest that mating strategies,

such as demonstrating domestic ability, attracting attention to appearance, and acquiring athletic ability. They are used frequently by some populations of men and women and are considered effective because they help people to display and show off characteristics that prospective mates often desire. In terms of reproductive success, they show that one has the resources to be a parent or provide food and shelter, and that one has good, healthy genes to be passed along to offspring (i.e., attractiveness and athleticism).

Other studies demonstrate the connection between aggression and mating effort behaviors. For females, recent literature suggests that they engage in aggressive mating effort strategies just as males do. While there have been reports of female direct aggression to compete for mates, research demonstrates that women are less likely to use physical aggression in mating effort strategies than males, but are more likely to use relational aggression. This may include putting down other females' physical features as well as spreading rumors and gossip about their competitors so that males are deterred from wanting to date them.

Still other researchers found that measures of delinquency and delinquent behavior are positively, significantly correlated with mating effort. This tells a different story, for it implies that acting aggressively is related to the effort one puts forth in mating, as opposed to saying that the strategies used are aggressive in nature. This may imply that those individuals that engage in aggressive and delinquent behaviors put forth more energy and effort in acquiring a mate than their peers who engage in less aggressive acts. The connection between mating effort and aggressive behaviors is complex and needs to be explored further.

The construct of risk taking behaviors may present similarly in its relationship with mating effort as aggression and delinquency. One way to look at how risk taking behaviors relate to mating effort is that some mating effort behaviors may be categorized as risk taking

behaviors. For instance, research supports that some adolescents and young adults may decide to consume alcohol or drugs in front of peers and members of the opposite sex to suggest a certain social status or seem as though they are engaging in socially cool behaviors. They may be engaging in the risky behavior of drug or alcohol consumption in order to attract a mate. Also, the research suggests that women are attracted to men who engage in such behaviors, which therefore gives incentive to behave accordingly. However, less is known about females' risky behaviors, though trends suggest that they engage in risky behaviors less frequently than males. Other theorists connect children and adolescents' adverse familial backgrounds with their use of risky mating strategies (such as promiscuity at a young age), however few researchers have examined the longer-term effects of adverse familial and environmental backgrounds in emerging adult populations.

Another factor that researchers have investigated is the relationship between physical attractiveness and mating effort behaviors. Research demonstrates that one of the main ways women compete is by enhancing their attractiveness and sabotaging or tarnishing the image of other females. Women go to varying lengths to improve their attractiveness on a continuum of simply styling their hair, going on a diet to improve their physique, or major cosmetic and reconstructive surgery. Theoretically, it seems that males and females who are unattractive would have higher mating effort, however one group of researchers found conflicting results which indicated that in their sample, the more attractive males had higher mating effort values than unattractive males. This result has not been replicated and would be interesting to investigate further, specifically the relationship between one's mate value, including attractiveness and how much mating effort they put forth in acquiring a mate. Also, it would also theoretically seem logical for someone who is unattractive to turn to aggressive strategies if

their less aggressive mating strategies were not successful in assisting one to find a mate. The relationship between the use of aggressive mating strategies and mate value needs to be examined further.

Study Rationale

Wilson and Daly (1985) noted the phenomenon that from late adolescence to young adulthood, boys engage in risk taking behaviors and also fiercely competed for mates indicating a YMS profile (1985). They connected these two constructs in that, when boys become interested in dating and mating, they begin to engage in mating strategies that are risky in order to attract opposite sex mates. The literature has provided empirical support for this phenomenon (Lalumiere et al., 2005; Quinsey, 2002). However, this spike of high mating effort and risk taking has been rarely investigated in adolescent girls. Also, other researchers have provided evidence that men and women who have high mating effort also endorse being more aggressive and delinquent (Charles and Egan, 2005; Rowe et al., 1997). Again, this hypothesis was first predicted for men, as it is classically viewed that men utilize aggression to compete for mates and often use these strategies to obtain short-term mating relationships, leaning towards the r-selected strategy. Less is known regarding the relationship between mating effort strategies, risk taking behaviors and aggression in women and young adolescence girls.

Many researchers have reported that there is still much to uncover regarding mating effort strategies in women, especially teen girls (Campbell, 1995; Hrdy, 1981). For women, some groundwork has been made regarding their use of relational aggression in mating behaviors, but these studies need to be replicated and ethnically and economically diverse populations should be included in the sample (Campbell, 1995). This may shed light on whether girls with high mating effort have increased aggression and risk taking behaviors, similar to

adolescent boys. Perhaps low income, adolescent girls engage in aggressive mating tactics in heated competition for the few desirable males. Or, perhaps early familial factors influenced their view that engaging in fleeting sexual relationships is an adaptive strategy. Some researchers noted that female intrasexual competition has been mostly studied in animal species, helping scientists to theorize and make predictions regarding female competition, such as expanding Darwin's sexual strategies theory to include female intrasexual competition (in addition to intersexual choosiness), but more data are needed to support these theories.

The areas of mate acquisition strategies, aggression, attractiveness, and risk taking behaviors have been addressed in research separately, but there are no studies which examine how these factors interplay. The few researchers who have measured and analyzed some of these factors together have noted that there is very little research available on these factors for ethnically diverse populations (Campbell, 2004). Much of the research on mating effort strategies and aggression have been done in adult populations and/or middle and low economic class Caucasian adults, limiting the ability to generalize to people of other ethnicities (Buss, 1988a; Buss, 1988b). Analyzing these factors together may provide evidence for a profile for girls, similar to YMS, and would clearly indicate which personal traits and mating strategies comprise r-selected adolescent girls. Also, by including developmental factors, such as parental psychological abuse and living in a home without one or both biological parent(s), may link home environment characteristics to how adolescent girls interact with peers, including engaging in aggressive, risky behaviors and increased mating effort (Belsky et al, 2010; Ellis & Essex, 2007).

Looking at the whole picture, it seems there are several variables interacting with one another in order to explain adolescent girls' mating effort strategies. How many and what kinds

of mating effort strategies one chooses to use may be based on several factors including their disposition of aggressiveness, attractiveness, the family in which they were raised, and their willingness to engage in risky behaviors.

Purpose of study

This study was conducted to investigate mating strategies in adolescence. This study was part of a larger longitudinal study, called the *Modifiable Risk Factors for Aggression*. The larger study followed a cohort of middle school students from sixth through eighth grades in a Northeastern suburban school district. While girls and boys were followed in the original study, this study will investigate only girls from the original study. As there is an established literature regarding adolescent boys' use of aggressive mating strategies, less is known regarding girls, especially ethnically diverse, young adolescents. This study will explore peer-rated flirting behavior in young adolescence and its relationship to many dependent variables including aggression, delinquency, drug use, dating behavior, and attractiveness (mate value).

Students participated in the study each year, during all three years of middle school. Each participant was asked to nominate three peers in the same class (as a group they are in a minimum of 4 classes, such as Language Arts, every day during the school year) who are "overly flirtatious/comes on strong with the opposite sex". Flirting behaviors of these girls was analyzed in its relationship to the dependent variables to investigate the extent to which girls have high mating effort also have increased aggression and risky behaviors similar to boys.

Hypotheses

Is peer-rated flirting a valid measure of mating effort in young, adolescent girls? If so, there should be a developmental progression that mirrors the onset of puberty with very low levels of flirting in 6th grade and rising levels in 7th and even more peer-rated flirting in 8th.

Hypothesis I. Mating effort is defined as the proportion of nominations an adolescent received from classmates out of all nominations in a class for flirting (“flirting/comes on strong with the opposite sex”). It is expected that mating effort will increase developmentally across the middle school years (ages 11-15). The National Health and Nutrition Examination Survey III (NHANES III), which ran from 1988 through 1994, indicated that a majority of girls from all ethnic backgrounds reach puberty by the end of 7th grade, at approximately 13 years of age. They measured this by breast development, start of menarche, and pubic hair. Because many sixth graders have not reached puberty in sixth grade, and sexual behaviors are closely linked with pubertal onset, low levels of flirting are expected in sixth grade with an increase in seventh and then eighth grades.

- a. It is hypothesized that if flirting is a characteristic of an individual once they enter puberty, there will be a significant correlation between flirting in grade seven and grade eight, but not from sixth to seventh.
- b. In order to examine the concurrent validity of peer rated flirting as a measure of mating effort, it is hypothesized that those mating strategies that are used more frequently also increase the success with which one mates and dates (Buss, 1988b). Thus, it is predicted that those who receive consistent, peer nominations as Flirters (i.e., are nominated as flirts in both seventh and eighth grade) will also be more frequently dating in eighth grade than those who consistently receive no nominations as flirts (i.e., are not nominated in seventh or eighth grade).

If the evidence is compelling that flirting is a valid measure of mating effort then the next hypotheses will be tested: Is there a pathway in girls that parallels YMS? Does this profile show that Flirters are significantly higher on aggressive behavior and risk taking behaviors including drug use and delinquency than Nonflirters?

Hypothesis II. The relationship between mating strategies and aggression has recently been developed in the literature for females (Campbell, 1995; Campbell, 2004). It is hypothesized that young adolescent girls who are consistently nominated by peers as Flirters, also have significantly higher rates of aggression, as assessed by the Revised-Class Play (Masten, Morrison, & Pellegrini, 1985), towards peers than those who are not nominated as flirts.

a. It has been established that girls are more likely to utilize relational aggression than overt aggression as mating strategies (Geary, 2010). Therefore, it is predicted that girls who are consistently rated by peers as Flirters have a significantly higher frequency of peer nominations for relational aggression than overt aggression as assessed by the Revised-Class Play (Masten, Morrison, & Pellegrini, 1985). If this is found to be the case, hierarchical multiple regressions will be run to see if consistent flirting in 7th-8th grade predicts overt and relational aggression in 8th grade after controlling for 6th grade overt and relational aggression and the 6th adverse background variables of living with both parents vs. other living arrangements and harsh parenting (psychological aggression by mother and father). Interactions between living arrangement in 6th and flirting, harsh parenting and flirting, 6th grade overt aggression and flirting, and 6th grade relational aggression and flirting will also be tested. These additional analyses will pose a stricter test of the hypothesis that flirting (mating) is driving the aggressive behavior (if flirting still predicts 8th grade aggression) as opposed to aggressive girls being more likely to be aggressive in their mating (if flirting no longer predicts 8th grade aggression).

Hypothesis III. Risk taking behaviors have also been associated with high mating effort in YMS. This finding has been replicated in the literature for adolescent boys (Lalumiere, et al., 2005; Wilson & Daly, 1985).

a. The risk taking behavior of drug and alcohol use has been established as having a positive relationship with mating effort (Egan & Hamilton, 2008). It is hypothesized that those girls who receive consistent nominations as Flirters, more frequently use drugs and alcohol, as measured by the self-report measure, The Personal Experience Screening Questionnaire (PESQ) (Winters, 1992), than those who are consistently not nominated. It is also hypothesized that those girls who receive nominations as Flirters have more severe problems relating to drug and alcohol use than those adolescents consistently not nominated as assessed via the self-report PESQ, Problem Severity subscale (Winters, 1992). If this is found to be the case, hierarchical multiple regressions will be run to see if consistent flirting in 7th-8th grade predicts drug problem severity in 8th grade after controlling for 6th grade adverse background variables of living with both parents vs. other living arrangements and harsh parenting (psychological aggression by mother and father). Interactions between living arrangement in 6th and flirting, harsh parenting and flirting will also be tested. No 6th grade measure of drug problem severity was available. These additional analyses will pose a stricter test of the hypothesis that flirting (mating) is driving the substance abuse (if flirting still predicts 8th grade aggression) after controlling for 6th grade adverse environment.

b. Delinquency is also classified as a risk taking behavior. There is evidence for a relationship between frequency of engaging in delinquent behaviors and mating effort as well (Barlas & Egan, 2006). Therefore, it is hypothesized that participants who receive consistent nominations as Flirters have significantly higher rates of self-reported delinquent behaviors than those who consistently do not receive nominations as Flirters as assessed by the Self-Report of Delinquency (SRD) scale (Elliot et al., 1985; Elliot, Dunford & Huizinga, 1987) administered in the 8th grade. If this is found to be the case, hierarchical multiple regressions will be run to see if consistent

flirting in 7th-8th grade predicts delinquency in 8th grade after controlling for 6th grade delinquency and the 6th adverse background variables of living with both parents vs. other living arrangements and harsh parenting (psychological aggression by mother and father). Interactions between 6th grade living arrangement and flirting, 6th grade harsh parenting and flirting, 6th grade delinquency and flirting will also be tested. These additional analyses will pose a stricter test of the hypothesis that flirting (mating) is driving the delinquent behavior (if flirting still predicts 8th grade delinquency) as opposed to delinquent girls being more likely to be aggressive in their mating (if flirting no longer predicts 8th grade delinquency).

Does adverse familial background relate to whether girls adopt aggressive mating strategies, in that adverse family background will be significantly more likely in Flirters than Nonflirters?

Hypothesis IV. The question is posed: Do consistent Flirters have significantly higher mean aggressive and risky behaviors than Nonflirters when controlling for family adversity when participants were younger? Researchers have found that sexual risk taking behaviors and early sexual debut are predicted by adversity in the family including maternal harshness and father absence (Belsky et al., 2010; Ellis & Essex, 2007). Researchers have also found that hostility and psychological abuse from the parent predicted early sexual debut (Gardner et al., 2011). Given the link between early (young adolescence) sexual experiences and earlier adverse family background, family adversity will be controlled for to assess if flirting predicts the outcome variables of aggression and risk taking behaviors. The adverse family background variables that will be used as controls will be who the girls live with and parental harshness in the form of psychological aggression. This would provide evidence that adolescent girl Flirters have a

developmental pathway, related to familial relationships and background, which in turn influence the relationship between flirting behavior and aggressiveness and risk taking.

Young, adolescent girls high on the personal characteristics of mate value (peer rated physical and sexual attractiveness using yearbook photos, self-report body image and appearance satisfaction on the Multidimensional Body-Self Relations Questionnaire – Appearance Scales (Cash, 2000)) will demonstrate more flirting than those low on these characteristics.

Hypothesis V. Attractiveness is linked to those who put forth higher mating effort, though the opposite was predicted in previous research (Rowe et al., 1997). It is hypothesized that peer perceptions of physical and sexual attractiveness and self-report of body image and appearance satisfaction measured in 8th grade by the Multidimensional Body-Self Relations Questionnaire – Appearance Scales (Cash, 2000) will be positively correlated with flirting in line with this previously found evidence. It is well established that adolescents use strategies, which are successful and that those that are more attractive also have high mating success. Therefore, it is thought that frequently flirting girls are also viewed as more attractive by self and peer-report as both constructs have been linked to the same outcome, mating success. It could be that those girls who are viewed as attractive and flirts are reinforced by their success in dating and so continue to flirt more frequently than peers who are viewed as less attractive.

CHAPTER II

METHOD

Participants

A cohort of sixth graders ($n = 732$, boys and girls) attending two urban, racially heterogeneous, low income middle schools (grades sixth – eight) in the Northeastern United States participated in a three year longitudinal study on modifiable risk factors for aggression.

The university IRB granted the study a waiver allowing for the use of passive rather than active consent. Prior to the beginning of the study, letters explaining the study and its purpose were sent home to parents in English and Spanish, and parents were given the chance to decline their child's participation. Students who participated in the study signed assent forms, after being informed about the purpose of the study and the confidentiality of their responses orally and in writing. Self-report data were obtained on 700 students in the sixth grade (47.4% Female), with an actual participation rate of 96% (27 refused, 5 absent). The age range of the sample in the sixth grade was 10-13 years old ($M=11.8$ years), with the following ethnic distribution: 42% Latina; 27.1% White; 15.8% African-American; 9.4% Biracial; 5.6% other. The socioeconomic status of the sample was estimated to be lower to middle class based on the large percentage of students who received subsidized school lunches. Below, in Table 1, is the demographic information on girls who had flirting data available in 6th, 7th, and 8th grade. These participants' data were used to investigate Hypothesis 1, which aims to provide validity for the flirting measure.

Table 1

Demographic & Descriptive Information on Participants who have Flirting data

		6 th grade (N=332) ^a	7 th grade (N=343) ^a	8 th grade (N=315) ^a
Demographic characteristics ^b				
	Mean Age (SD)	11.70 (.49)	12.65 (.47)	13.65 (.48)
	Range of Years	(10-13)	(11-14)	(12-15)
Race	%			
	Latina	42.4	43.4	41.2
	Black	15.3	20.2	21.0
	Asian	1.1	1.8	2.4
	White	25.4	23.9	24.7
	Biracial	13.6	7.3	7.9
	Other	2.3	3.4	2.7
	Eat free/reduced lunch	85.9	93.2	63.0
	Live with both parents	31.0	35.8	35.2
	Dating $M(SD)$ ^b			3.92 (1.91)

Note. This table provides demographic variables on the total sample for girls in each grade. It is not a description of the same set of individuals across three years.

^a N varies slightly per variable. ^b Based on participants for whom flirting data were collected.

Procedure

A series of individual measures, in questionnaire format, were administered in classrooms over a two-day period (approximately 45 minutes per day) once a year for three years. (The measures used in this study are described below.) In the late fall of each year, a team of trained researchers orally administered the questionnaires to the students during their language arts or social studies class. The researchers described the purpose of the study and explained to the students that the information was going to be used to gain a better understanding of relationships between students and their peers, teachers, and parents. Students were told that they would be answering questions about their friendships, relationships with teachers and parents, and their feelings about themselves. The students were told that their responses were confidential and ID codes were used instead of names, to ensure confidentiality. ID codes were based on the students' school identification number. Students were given a questionnaire with their name and ID code on a cover page and only their ID code on page one of the questionnaire. Students were asked to first check that the ID code was the same on both the cover page and page one of the questionnaire; they were then instructed to remove the cover page with their name. A key to the ID codes was maintained on one hard copy and a password protected file. Students were told that if their responses indicated harm to themselves, the primary project investigator would ask to speak with them to assess their risk, and refer them to the school psychologist or school social worker if she deemed it necessary. This information was provided on a consent form that the students were asked to sign if they agreed to participate in the study. Given the different reading abilities in the sample, a researcher read the entire questionnaire aloud while students marked their responses on the questionnaire. Another researcher monitored the classroom, answering

questions for individual students and making sure that all students were following along and understanding the questions being asked.

The questionnaire was also translated into Spanish reflecting usage in Western Massachusetts. It was translated initially by a New York Puerto Rican Spanish speaker, then back-translated by a native Western Massachusetts Puerto Rican Spanish speaker, and then reviewed by another Western Massachusetts Puerto Rican speaker. The final translated version was administered orally to the Spanish speaking students (N=70 in sixth grade) by a Native Spanish speaking researcher (Dominican with many years of experience with New York and Eastern Massachusetts Puerto Rican Spanish). Reliability analyses on the translated version of the questionnaire indicated minimal differences in coefficient alphas, thus suggesting no need to analyze data separately. Questionnaires of students, whose responses seemed questionable (i.e., they responded all true to a scale with reverse coded items) and who seemed to be distracted or not paying attention during the administration, were flagged and reviewed carefully for their validity. After careful examination, no students' questionnaires were eliminated, as responses appeared valid and reliable.

The administration of the questionnaires (over the course of two days) was approximately 1 ½ hours. All students earned attractive mechanical or colored pencils for their participation; further incentive for participating on both days was given through a raffle on the last day of data collection each year, in which 11 to 14 students were randomly selected to receive cash gift certificates (\$10 and \$20) to the local shopping mall.

In the early winter of each academic year, the team of researchers returned to the schools to administer the questionnaires to those students who did not have time to complete the questionnaire or who were absent during the data collection. These students were divided into

small groups, and the questionnaire was administered orally, as explained previously. Several students worked independently, if they indicated that they preferred to read and fill out the questionnaire themselves. (Analyses were conducted to assess the reliability of the questionnaires administered during this second period of time, compared to the first time period, and no significant differences were noted). Furthermore, in order to receive longitudinal data on those students who had participated in the study during the 1st and/or 2nd year of data collection, and were no longer attending one of the two schools used in the data collection, researchers went to various schools in the district during the last year of data collection to administer the questionnaire to these students.

Subsample Selection

In the current study, a subsample of participants who had peer nominations of flirting (including not receiving nominations) was used instead of using the technique of imputation to address concerns of missing data. In order to investigate Hypotheses 2 through 5, girls who had flirting data available were divided into two groups based on peer nominations of consistent flirting in 7th and 8th grade and consistently not flirting in either grade, which is described in detail in Methods. Table 2 provides demographic information on these Flirters (in both 7th and 8th grades) and Nonflirters (not nominated in either grade), for which there were 190 girls who had flirting data available for 7th and 8th grades. Attrition analysis, described in the results section below, suggests that the subsample of participants for whom there are data on the flirting measure in 7th and 8th grade does not significantly differ from the total sample on demographic variables. These participants do not vary from the total sample of girls on age, race, which parents/guardians they live with, SES, and parents' highest education levels. From this, one can assume that the subsample of participants for whom there are flirting data in 7th and 8th grade is

generally representative of the total study sample. A large sample size is retained with using the subsample, which will allow for adequate power analyses. For these reasons, it was decided to use the subsample of participants who had flirting data rather than to impute missing data.

Table 2

Descriptive Information on Variable Consistent Flirting by category

	Nonflirters (N=99)	Flirters (N=91)
% of subsample	52.1	47.9
Age Range of Years	11-15	11-15
Race (within group %) ^a		
Latina	34.8	51.2
Black	18.5	15.1
Asian	2.2	2.3
White	32.6	23.3
Biracial	8.7	5.8
Other	3.3	2.3
Free/reduced Lunch (within group %) ^a	54.8	72.9
Live with Both Parents (within group %) ^a	44.2	36.0
Dating, M(SD) ^a	2.96(2.01)	4.67(1.48)

^aBased on eighth grade data only

Measures

A variety of multiple-respondent measures were used for the larger research project. However, for the purposes of the current study, only the measures described below were utilized.

Revised Class Play – Peer Report. Social reputation of students based on peer report was assessed using a modified version of the Revised Class Play (RCP) (Masten, Morrison, & Pellegrini, 1985) which has been used widely in the field. Students were asked to imagine that they were directing a play, and that they were required to cast their classmates in the most appropriate roles. The students were provided with a class list and asked to identify up to three individuals who they felt best suited the role that was listed. Students were informed that a classmate could be selected for more than one role; however, students were not allowed to pick

themselves for any role listed. Students who were not originally on a class list, but were new members on a class, were manually added on the day of data collection, to ensure that they could be selected by their peers. During data cleaning, if self-selection did occur, this vote was counted as missing. The original version of the revised class play consisted of 30 roles, 15 positive attributes and 15 negative attributes. Three subscales, based on an exploratory factor analyses that determined 3 different factors, were derived, and included, Social-Leadership, Aggressive-Disruptive, and Sensitive-Isolated (Masten et al., 1985). Four dimensions have also been found through exploratory factor analyses in a study with adolescent populations, and have included Peer Popularity, Aggressive/Disruptive reputation, Isolation in the peer group, and Prosocial Orientation (Luthar & McMahon, 1996; Zeller, Vannatta, Schafer, & Noll, 2003). Zeller et al., (2003) also found support for the validity of 4 factors, in the significant patterns of association between the subscales and measures of peer acceptance that emerged across several age groups.

To accommodate the interests of the larger research project, the 30-item scale was further revised. Seven additional items developed by Luthar and colleagues were added in a pilot study, that included 6 Relationally Aggressive items (i.e. excludes people from being in their group of friends), and an item of interest to the researchers including “Is a good athlete”. Furthermore, three items from the original Revised Class Play were dropped including, “acts like a little kid”, “usually happy”, and “has good ideas for things to do.” This version of the Class Play with 35 items was used in the first year of the current study, including the flirting item discussed below (sixth grade). However, given its long length and the time constraints of data collection, the class play was reduced down to 15 of the original items for the remaining two years of data collection, including the flirting item (seventh and eighth). The remaining items were chosen based on students’ feedback of the items during the pilot study and the first year of data collection, and an

exploratory factor analysis of the pilot data. Several items from 4 of the factors were retained, though only 2 factors were used as part of the current study: Aggressive/Disruptive subscale and the Relational Aggressive subscale. There were 3 items on the Aggressive/Disruptive subscale (i.e., “Loses temper easily”), and 3 items on the Relationally Aggressive subscale (i.e., “Tries to make other kids not like a certain person by spreading rumors about them”). It is of note that the flirting item was not included in any of the factors, and rather was analyzed as a single item. Therefore, in total six items were used from these two factors for the current study.

Factor analyses on these 15 items, across all three years of data collection, however, revealed only three factors; the Relationally Aggressive and Aggressive/Disruptive dimensions were not distinguished by the factor analyses (Zybert, personal communication, 2003, as cited in Greenwald, 2004). Therefore, Relationally Aggressive and Aggressive/Disruptive items were combined into one scaled score totaling 6 items. Furthermore, it is interesting to note that the item “Is overly flirtatious” was not expected to load on any of the factors; however, in the 2nd and 3rd years of data collection, it did load on the overall Aggressive subscale.

Scores for each item were determined based on the total number of votes they received for that item within their class. Each student’s score for an individual item is the proportion of votes they received by their classmates to the total number of votes in the class for that item. Scores for each of the subscales are based on the average of their scores (the proportions) for the individual items in each subscale. It is important to note that a number of students did not receive any votes for a particular subscale. For example, on the Aggressive Behavior subscale approximately 15% of students did not receive any votes for any of the items on that scale. Internal consistency alphas revealed good internal reliability for Relationally and Overtly Aggressive/Disruptive subscale (Cronbach’s alpha = .84, .90, and .91 in sixth-eighth grades,

respectively). Luthar and McMahon (1996) found similar reliability alphas based on internal consistency (ranging from .82 to .88), in their analyses of the RCP and its correlates. Validity has been established for each of the subscales through correlations of similar measures: the Aggressive/Disruptive subscale has been shown to be positively associated with teacher ratings of aggression and learning problems and negatively associated with grades. The current study used the Aggressive/Disruptive subscale and the Relational Aggressive subscale to assess peer ratings of aggressive behavior. They were treated as two different subscales here, though they were not distinguished in previous factor analysis (Zybert, personal communication, 2003 as cited in Greenwald, 2004).

Flirting. This item was collected as part of the Revised Class Play, Peer Report discussed above (Masten, Morrison, Pellegrini, 1985), although it was not an original item in the Revised Class Play. It was asked at the end of the other Revised Class Play items and therefore students were given the same directions for this measure as they were for the other Revised Class Play items, discussed above. Students in all three years of the original study were asked to nominate up to three students who were “overly flirtatious/comes on strong with the opposite sex.” The item was developed by asking 7 multiracial 11-13 year old adolescents (4 girls, 3 boys) if they knew kids their age who were big flirts, who made an obvious effort to attract the attention of other kids that they were romantically interested in. They all said that they did. They were then asked what words they would use to describe these kids. Most suggestions were similar to the final version and all 7 agreed that “kids like them” would know what was being asked if the final wording was used. Approximately 40-50% of students across the three years did not receive a vote on the Flirtatious Behavior item.

Flirting can be viewed as a measure of mating effort as it is a mating strategy used commonly by men and women. A review of the literature suggests that mating effort is the energy one puts forth to acquire a mate (Rowe et al., 1997). Flirting, or coming on strong with the opposite sex, is considered to be subsumed under the construct of intrasexual competitive behaviors, which humans utilize in order to compete against same sex opponents for opposite sex mates. Flirting can be viewed as a mating effort strategy used to signal to the opposite sex that one is interested in engaging in a sexual and/or romantic relationship with the possible mate. Walters and Crawford (1994) investigated the behavioral acts that undergraduates engaged in to compete with others of the same sex. The participants' average age was 21. These behaviors were grouped into categories by four independent coders (two men, average age 37). One such category was *attract attention to sexual activity*, which flirting and coming on strong to the opposite sex correspond with. Buss (1988a) also investigated mating acquisition behaviors in college students and found that the act of *flirting* was reported frequently by both male and female students, with no gender differences in frequency of use (Buss, 1988a). Bleske-Recheck and Buss later included the act of flirting as an item in their Mate Attraction Tactics scale (2006).

As such, the flirting item was utilized as a measure of the participants' mating effort in the current study. The evidence supporting the flirting item as a valid mating effort measure will be covered via the specific hypotheses covered in Hypothesis I and a discussion of these results is to follow. While this mating effort measure was operationalized by the use of 1 item, this item is considered a reliable one item measure. This is because every student was given the opportunity to nominate three people who come on strong to the opposite sex. Therefore, each participant's mating effort measure of flirting was cumulated via all the votes each participant received. Because of the vast number of students who did or did not nominate their peers as

flirters, this measure is considered a reliable measure of mating effort behavior. Also, the validity of this item was established in the original study as it has a significant, positive relationship with dating behavior ($r = .174$) (Greenwald, 2004).

Self-Reported Delinquency. The Self-Report of Delinquency (SRD) scale (Elliot et al., 1985; Elliot et al., 1987) measured students' self-reported frequency of delinquent acts that they engaged in over the past year. The scale consists of 38 items that assesses a comprehensive range of both overt and covert acts of delinquency, including physical aggression, weapon possession and use, drug dealing and drug use, gang fights, stealing, vandalism, and truancy (e.g., "Stolen or tried to steal something that's worth more than \$50.00?"; "Attack someone because you wanted to seriously hurt or kill them?"). In the current study, the scale consisted of only 35 items, in order to reduce redundancy with other measures. Five items were omitted, including: "damaged or destroyed something on purpose that belongs to your parents, brothers or sister, (or other family members)?", "damaged or destroyed something on purpose that belongs to a school?", "used fake money to pay for something?", "hitch-hiked where it was against the law to do so?", "been suspended from school?" However, two items were added: "been drunk or high in school" and "used cocaine, crack, inhalants, speed, heroin, or other drugs except for marijuana/pot?" All items were responded to on a 4-point Likert-type scale (1=never; 2=once in a while (1-2 times/year); 3=pretty often (3-4 times/year); 4=very often (5+ times/year)). Students' responses to all 35 items were averaged to produce a scale score, with higher scores indicating a greater frequency of delinquency.

The SRD is one of the leading instruments used in delinquency and juvenile offender research (Elliot et al., 1985) and self-reports have been cited as advantageous with this population as subjects typically reveal many more offenses than are in official records

(Farrington, 1997). Also, official records may be less valid due to biases in police or court processing. Discriminate validity and predictive validity for the SRD have been supported with chronic offenders (Dunford & Elliot, 1984) and serious offenders (Elliot, Huizinga & Mendard, 1989). Consistent with other studies, internal consistency in this study was excellent (Cronbach's $\alpha = .93$ in eighth grade). Validity of this modified version is established through pilot data which used all original 38 items and this current study, which both indicated significant positive correlations between the SRD and teacher' ratings of aggression and number of discipline referrals.

Dating. According to the literature on adolescent development, the pubertal and social changes that occur during early adolescence reflect the onset of dating behaviors that emerge during this time (Connolly, J. Furman, W., & Konarski, R, 2000). Thus, students' amount of heterosexual dating was measured in the last year of data collection (eighth grade) when a greater majority of the adolescents, including boys, would have begun to go through puberty, and dating would seem to be most salient. Based on a dating scale used by Pellegrini (2001, as cited in Greenwald, 2004), which was originally adapted from Simmons and Blyth (1987), students were asked the question: "How often do you go out with/meet a boy/girl somewhere?" Students were told that this question was referring to "dating or going out with someone of the opposite sex." Response choices were based on a 6-point Likert-type scale (1=never; 2=once every 2-3 months; 3=once a month; 4=2 times a month; 5=once a week; 6=more than once a week).

The Personal Experience Screening Questionnaire. The Personal Experience Screening Questionnaire (PESQ) was developed by Winters (1992), to provide clinicians with a tool to assist in the identification of teenagers needing a drug abuse assessment referral. This measure was developed by selecting unused items from the pool of items used to develop the

Personal Involvement with Chemicals scale of the Personal Experience Inventory (PEI). The PESQ is a 40-item questionnaire intended for adolescents 12 to 18 years of age and provides five areas of information: a) Problem Severity b) Defensiveness c) Infrequency d) Psychosocial concerns and e) History of Drug Use. For the purposes of this study, only the subscales of Problem Severity and History of Drug Use were used. This scale was developed from a 276 item scale, the Personal Experience Inventory (Henley & Winters, 1989) which consists of 33 subscales and measures an adolescent's involvement with alcohol and other drugs.

The global measure of Problem Severity consists of 18 items and indicates the extent to which an individual is psychologically and behaviorally involved with drugs. Subjects are asked to respond using a 4-point Likert-type scale (i.e., never, once or twice, sometimes, often) and respond to questions such as "How often have you used alcohol or other drugs with older friends?" and "When using alcohol and other drugs, how often have you spilled things, bumped into things, fallen down, or had trouble walking around?" The Problem Severity Scale possesses high inter-item consistency (alpha coefficients = .90 to .95) across different settings (Public School, Juvenile Offenders, School Clinic). In our study, we found an alpha level .91 in 8th grade.

A history of drug use is also assessed in this measure by asking the frequency of use of various drugs during the last 12 months. Subjects choose from seven response types ranging from Never to Over 40 Times for alcoholic beverages or marijuana use and once or more for a list of hard drugs. This measure also encompasses two questions which assess the time when the subject first got high and first used drugs regularly. In the third year of data collection, four questions were added to this section, which assessed the subjects' use of tobacco and ecstasy.

Also included were two items assessing when the subjects smoked their first cigarette and first used ecstasy. In our study, we found an alpha level of .75 in eighth grade.

Content and construct validity for the PESQ was tied to the content and construct validity of the PEI which was judged to be adequate. A correlation of .94 represents the relationship between the PESQ Problem Severity Scale and the PEI Personal Involvement with Chemicals scale. The items used to develop the Defensiveness scale were adapted from the Marlowe-Crowne Social Desirability Scale, and appear to have adequate content validity. Criterion validity was also assessed and deemed to be strong for the PESQ. Individuals with drug treatment histories and with clinical diagnoses of dependence were found to have significantly higher PESQ Problem Severity scale scores than those with no prior treatment histories.

Mate Value. For this study, there is not a complete measure of mate value available for use. Attractiveness, both self-report on body image and appearance and peer-report on facial attractiveness will be used as it is one aspect of one's mate value.

The Multidimensional Body-Self Relations Questionnaire – Appearance Scales. This 34-item self-report inventory measures self-attitudinal aspects of the body image construct, including evaluative, cognitive, and behavioral components (Cash, 2000). The MBSRQ-AS is a shorter version of the MBSRQ (69 items) excluding subscales such as fitness evaluation and orientation, health evaluation and orientation, and illness orientation. The MBSRQ-AS includes the subscales: Appearance Evaluation, Appearance Orientation, Body Areas Satisfaction Scale, Overweight Preoccupation, and Self-Classified Weight. For the purposes of the current study, the Appearance Evaluation subscale was used. High scores on the Appearance Evaluation subscale indicate greater likelihood to be content with aspects of one's appearance. Items are scored on a 1 to 5 Likert scale that varies depending on the subscale. The scale labels include

ranges of agreement (definitely disagree to definitely agree) on items such as “I check my appearance in a mirror whenever I can”; ranges of satisfaction with various body parts (very dissatisfied to very satisfied) on items such as “Mid torso (waist, stomach)”; and frequency of occurrence (never to always) on items such as “I have tried to lose weight by fasting or going on crash diets.” Embedded in the questionnaire are 6 items that are inconsistent with body satisfaction such as “I dislike my physique” and are reversed scored. These items form a check of response set.

The full version of the MBSRQ was standardized on a sample of 2,000 men and women randomly sampled and stratified on the basis of the sex/age distribution in the United States population from the over 30,000 respondents to a national body image survey. Sample participants were 18 years of age and older. The Body Areas Satisfaction Scale and Self-Classified Weight factor subscales were altered after the 1985 survey. These two factor subscales are a combination by the author of several samples (N = 804 women; 335 men). The MBSRQ-AS was used for this study, however, it was not normed on the subjects' same aged population. Some experts in the field do not condone this. However, the comprehensive nature of this assessment of body image disturbance provided by a multidimensional approach and discussions with Cash giving his consent offer justification for its use in this case. It also has provided an opportunity to provide new norms on the population used, which is often cited as a future research goal for the field.

Cronbach's alphas were reported for each scale in the standardization sample. The Appearance Evaluation subscale alpha for females was .88. One-month test-retest reliabilities derived from college student samples were also provided for females for each scale. The test-retest correlation for this subscale was .91 (Cash, 2000). According to Brown, Cash, & Milkulka

(1990), the same 5 factors (Appearance Orientation, Appearance Evaluation, Body Areas Satisfaction, Self-Classified Weight, and Overweight Preoccupation) emerged for subjects when cross-validated. The MBSRQ was validated with two other body image instruments, the Body Cathexis Scale (BCS) by Secord and Jourard in 1953, and the Body Esteem Scale (BES) by Franzoi and Shields in 1984 (Brown et al., 1990). Factor Analyses for these measures revealed three distinct factors for both the BCS and BES. So these two measures are not perfectly congruent with the 5 factors of the MBSRQ, but there is a correlation between the appearance/attractiveness dimensions of the MBSRQ, the BCS, and the BES. Specific values were not reported. The overall factor analyses of the MBSRQ do speak to body image as a multidimensional, not a unilateral construct, as previous body image measures have indicated. In this study, the reported Cronbach's alpha for girls' Body Image Appearance is .75.

Attractiveness. In a follow-up study, twenty-four (12 male) lower income, urban multiethnic sixth to eighth graders attending a parochial school in upper Manhattan rated a random selection of 200 yearbook photos presented one at a time on a computer program in the school computer lab for one hour after school. For each black and white photo (enlarged to size: 2 and $\frac{3}{4}$ " by 2 and $\frac{1}{8}$ "") they answered the following questions using a Likert scale: 1. Do you think the person is physically attractive? [unattractive, somewhat unattractive, somewhat attractive, attractive] 2. Do you think other kids would want to 'go out' with (date) this person? [no, probably not, probably, definitely]. Only physical and sexual attractiveness, as defined by how likely peers would want to date the subject, based on photos from seventh and eighth grade was used for the purposes of this study. Seventh grade ratings were used in addition to eighth grade ratings because yearbook photos were available from eighth grade year for one middle school and for seventh grade in the other middle school. If seventh grade photos were not used

in this study this could create a bias in interpreting attractiveness and its relationship to flirting as only one middle school group would be used. Written parental consent and student assent were obtained. Students were paid \$5 for one hour's work.

Facial ratings of physical attractiveness and sexual attractiveness were investigated to ascertain if there were biases based on gender of rater. Boys' mean ratings of the physical attractiveness of the female yearbook face photos ($M = 2.66$, $SD = 1.73$) were not significantly different than girls' mean ratings ($M = 2.52$, $SD = 1.61$, $t(185) = -1.030$, $p = .305$). Boys' mean ratings of sexual attractiveness of female yearbook face photos ($M = 2.70$, $SD = 1.68$) were not significantly different than girls' ratings of females' sexual attractiveness ($M = 2.83$, $SD = 1.45$, $t(185) = .985$, $p = .326$). However, inter-rater agreement among the 4 raters of each photo (2 boys, 2 girls) was low on each variable even though some pairs of raters achieved fairly high agreement. Looking across rating studies using naïve raters it was found that participants were either trained raters to an established criterion of attractiveness or studies used a large number of raters (i.e., 28). Because the goal of these measures was to investigate the students' own perception of the photo, not their ability to rate to criterion, the variables physical attractiveness and sexual attractiveness were pooled together from each of the 4 ratings for each photo with the higher number of points corresponding with higher rates of physical and sexual attractiveness. This pooled measure had a high, significant correlation between sexual and physical attractiveness for eighth grade females ($r = .858$, $p = .01$) and for seventh grade females ($r = .572$, $p < .001$). This high correlation supported that the two pooled attractiveness variables were measuring similar constructs.

Adverse Family Background. Based on research findings, factors that contribute to having an adverse family background include who the child lives with and whether the child is a

victim of physical, sexual, and/or psychological abuse (Belsky et al., 2010; Ellis & Essex, 2007). The adverse family background variables included in this study were the child's living arrangements in 6th grade. Regarding who the child lives with, this variable was dichotomized as living with both parents versus living with only one parent or all other options, such as living with a stepparent or other relative.

As the literature suggests, parental harshness is a key aspect of adversity in the family. In this study this was measured by psychological abuse by each parent via the Conflict Tactics Scale. The Parent-Child Conflict Tactics Scales: Parent-to-Child Version (CTSPC; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998) was developed from the well-known and widely used Conflict Tactics Scale (CTS; Straus, 1979). The CTS is the only nationally normed measure of psychological and physical aggression for spousal and parent-to-child conflict and has been used in over 200 empirical studies. The five-item psychological aggression scale on the CTSPC asks the child how often each conflict resolution tactic, (e.g., "Called me dumb or lazy or some other name like that") is used by each of her parents, and is measured on a 7-point scale that includes never, once a year, two to three times in a year, four to six times in a year, seven to ten times in a year, and more than once a month. The ability to measure physical and sexual abuse was constrained as these data were collected in a public school and the school officials were not amenable to collecting this information.

CHAPTER III

RESULTS

Is peer rated flirting a valid measure of mating effort?

Predictor variable. For the current study there are Flirting data for each grade on 332 female students in sixth grade, 343 female students in seventh grade, and 315 female students in

eighth grade. Descriptive analyses were performed on the demographic variables for all three grades and for dependent variables used in the study for eighth grade data collection only. This was done for consistency because some outcome measures were only collected when the students were in eighth grade (Table 1 above).

Mean flirting nominations were examined for each grade. In sixth grade mean flirting nominations for girls was $M = 3.58$, $SD = 4.43$. In seventh grade girls mean flirting nominations was $M = 4.85$, $SD = 8.39$. Lastly, in eighth grade mean flirting nominations was $M = 5.19$, $SD = 7.99$. Mean flirting nominations increased with each grade. Mean flirting nominations in 7th grade were significantly higher than in 6th grade, $F(1, 293) = 8.04$, $p = .005$. Mean flirting nominations in 8th grade were not significantly higher than 7th grade nominations $F(1, 270) = 0.90$, $p = .345$. However, peer nominations of flirting were significantly higher in 8th grade than in 6th grade $F(1, 239) = 9.55$, $p = .002$. Correlations were examined among the peer report flirting item, which was collected in sixth, seventh, and eighth grades (see Figures 1, 2, and 3) in order to investigate Hypothesis 1. Peer nominations of flirting in seventh grade had a significant, positive relationship with peer nominations of flirting in eighth grade ($r = .452$, $p < .01$). This indicated that participants who were nominated by peers as a flirt in seventh grade were also likely to be nominated as flirts in eighth grade. There was not a significant relationship between peer nominations of flirting for sixth graders and seventh graders ($r = -.083$, $p = .16$) or for sixth graders and eighth graders ($r = .001$, $p = .98$) for the study sample.

Attrition analysis. Attrition analysis was administered in order to investigate possible significant differences on demographic variables based on whether there are data on the peer-rated flirting measure in 7th and 8th grade. Students with non-missing data on grade 7 flirting item were compared with students who had missing data in grade 7 for the flirting item. No

significant differences were found between missing and non-missing flirting item on race, who participants live with, age, mother's highest level of education, or father's highest level of education. For the measure of SES, whether students received free or reduced lunch, students with missing and non-missing data differed significantly, $X^2(3)= 9.61, p = .022$. Students with missing data were more likely to receive free or reduced lunches, 100%, versus 93% of participants who did not have missing flirting data. These results should be interpreted with caution based on this. Chi-square is sensitive to small "effect size" differences when there is a large sample, which seems to be occurring with this demographic variable of SES. In order to understand the importance of this finding, the Cramer's V was examined, based on the standards of .10 = small, .30 = medium, and .50 = large effect size. Based on this standard, the significant difference of SES based on missing versus non-missing data for the flirting item was small (Cramer's V = .17).

The same comparisons were made on 8th grade flirting data and the missing data for flirting in 8th grade. No significant differences were found between the missing and non-missing data for flirting on the demographic variables of race, SES, age, mother's highest level of education, or father's highest level of education. For the measure of who participants live with, students with missing and non-missing data significantly differed, $X^2(8)= 16.70, p = .033$. Eighth graders with missing data were less likely to live with both parents as 22% of missing data participants lived with both parents, whereas 35% of non-missing data participants lived with both parents. These results should be interpreted with caution based on this. When analyzing the Cramer's V, the significant difference of who participants live with was small (Cramer's V = .22). In summary, these findings suggest that the non-missing data on flirting in 7th and 8th grades is reasonable representative of the total study sample for these girls.

Descriptive statistics. Correlations among variables of interest were examined only for eighth grade data because some variables were only collected when participants were in eighth grade. Peer reports from both genders of Flirting in eighth grade were modestly, significantly correlated with frequency of dating ($r = .174, p < .05$), which indicated that the more nominations one had as a flirter, the more frequently they were dating. This analysis was conducted to investigate Hypothesis 1. In order to investigate Hypothesis 5, peer report of flirting did not have a significant relationship with body image appearance satisfaction. In terms of peer reports of attractiveness, there was a significant relationship between peer reports of flirting and facial physical attractiveness ($r = .231, p < .05$) and facial sexual attractiveness ($r = .229, p < .05$). Flirters were more likely to be nominated by peers as physically and sexually attractive based on their eighth grade yearbook photos.

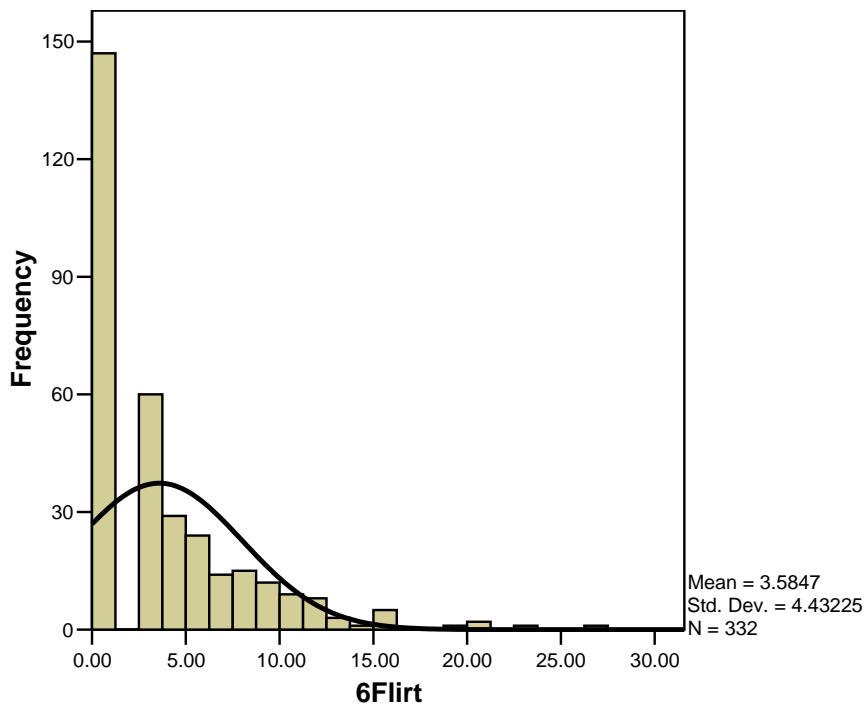


Figure 1. Peer nominations of Flirting, 6th grade

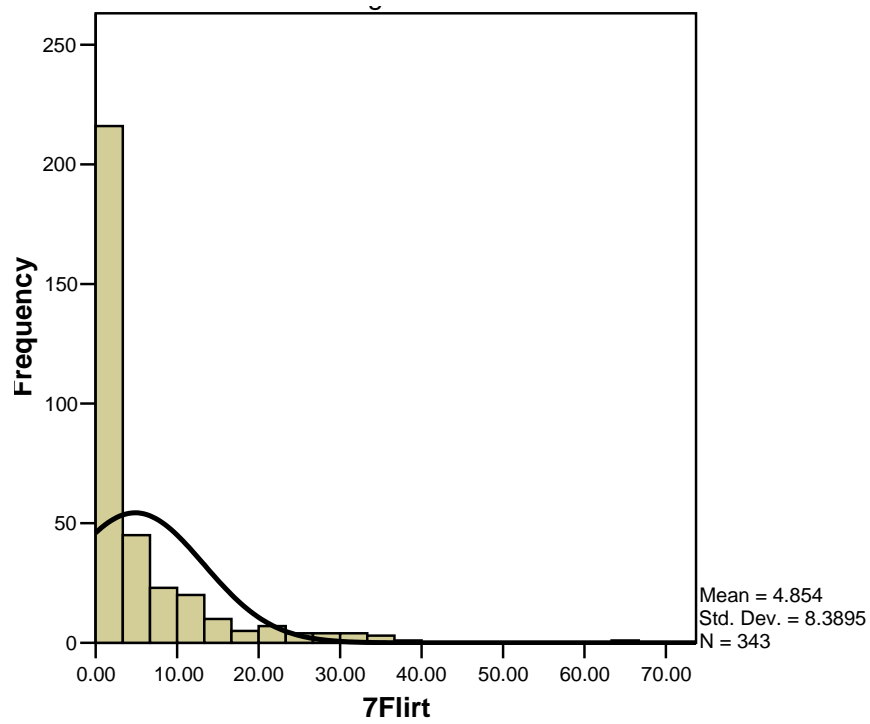


Figure 2. Peer nominations of Flirting, 7th grade

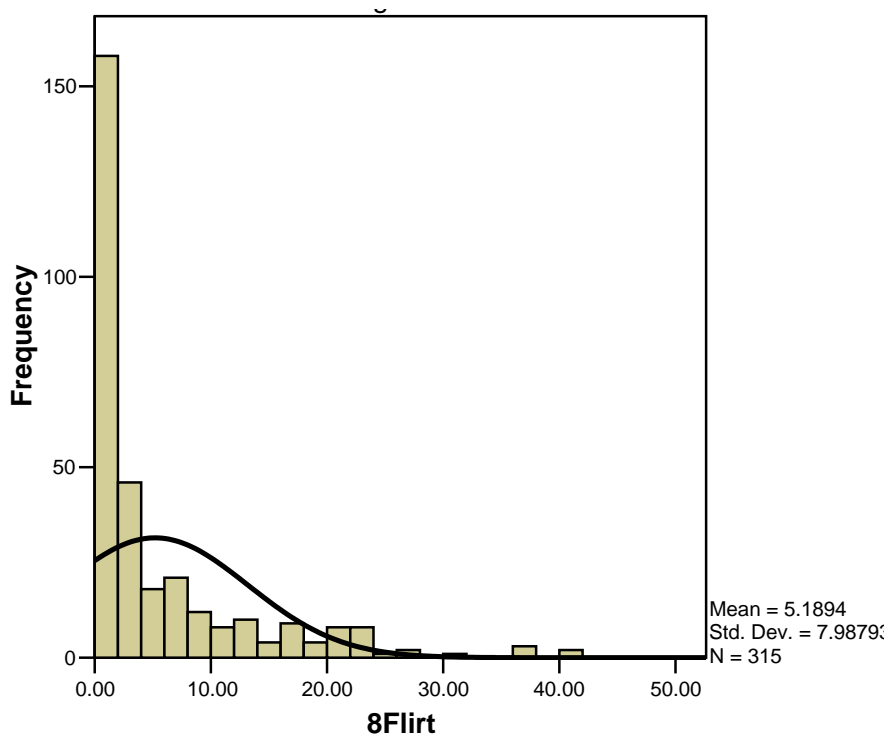


Figure 3. Peer nominations of Flirting, 8th grade

Subsample. Subjects in the current study were divided into two Flirting groups in order to analyze flirting as developmental, consistent characteristic. This variable was analyzed categorically in order to better understand the make-up of the profile and contrast it with participants who did not fit the profile. After analyses of the data were conducted, it was clear that two groups naturally formed; those seventh and eighth grade students who were not nominated by peers as flirterers in either grade, and those seventh and eighth grade students who were nominated as flirterers in both grades. These two groups were named “Consistent Nonflirterers” and “Consistent Flirterers”. Other Flirting groupings were assessed for their appropriateness, such as seventh and eighth grade students who were not nominated, students that were only nominated in seventh grade, students only nominated in eighth grade, and students consistently nominated. Via analysis of variance tests, it was demonstrated that most of the significant differences among the factors relating to the proposed hypotheses in this 4-level grouping were between the Nonflirterers and those who flirted consistently. For this reason, the two middle groups were dropped for the current study.

Thus, two groups were comprised of Nonflirterers and Flirterers (Table 2, above). Consistent Nonflirterers ($n = 99$) were participants who were not nominated in seventh or eighth grade by peers as people who were flirtatious or came on strong with the opposite sex. Consistent Flirterers ($n = 91$) were participants who were nominated in both seventh and eighth grade by at least one peer as people who were flirtatious or came on strong with the opposite sex.

Identification of covariates. Pearson’s Chi-Square test computations were conducted in order to analyze differences among consistent Nonflirterers and Flirterers on the demographic variables of race, socioeconomic status, and guardians with whom participants lived. Flirterers and Nonflirterers significantly differed on the race classification of Latina/Hispanic, $X^2(1) = 4.874$, $p =$

.034. This indicated that there were significantly more Latina participants who were nominated as consistent Flirters than Nonflirters as 51% of Flirters identified as Latina versus 35% of Nonflirters identified as Latina. Flirters and Nonflirters did not significantly differ on the race classifications of White, $X^2(1) = 1.925, p = .185$, Black, $X^2(1) = .359, p = .346$, Asian, $X^2(1) = .005, p = 1.000$, Biracial, $X^2(1) = 0.545, p = .569$, or the race classification of Other, $X^2(1) = 0.105, p = .737$.

Socioeconomic status was measured by whether students received free or reduced lunch or not. Groups differed by socioeconomic status, $X^2(1) = 6.278, p = .013$ in that 73% of consistent Flirters received free or reduced lunch whereas 54% of consistent Nonflirters received free or reduced lunch. Also, participants reported which parents lived in their home and who their primary caregivers were. This variable was measured as whether the participant lived with both parents or not. Flirting groups did not differ by who participants lived with, $X^2(1) = 1.303, p = .293$. Thus, the race classification of Latina/Hispanic as well as socioeconomic status were considered as to whether they should be included as covariates in further analysis. These two demographic variables generally did not have strong, positive correlations with the dependent variables. For the girls in this sample, identifying as Latina had a significant inverse relationship with drug problem severity ($r = -.153, p < .01$) as well as an inverse relationship with self-report delinquency ($r = -.128, p < .05$). Girls who received free or reduced lunch had a weak, significant relationship with being nominated as overtly ($r = .130, p < .05$) and relationally aggressive ($r = .134, p < .05$). There were no other significant relationships between these demographics and the outcome measures of interest. Therefore, identifying as Latina and receiving free or reduced lunch were not used as covariates in further analysis.

Regarding the family adversity variables, Pearson's Chi-Square test computations were conducted in order to analyze differences between consistent Nonflirters and Flirters on whether they lived with both parents or not in 6th grade. Flirters and Nonflirters did not significantly differ on 6th grade living arrangements, $X^2(1) = 0.265, p = .607$. Analysis of variance was used to compare means between Flirters and Nonflirters on their self-report of mean parental psychological aggression. This was a combined variable of self-report of both paternal and maternal psychological aggression in 6th grade. There was no significant difference between Flirters and Nonflirters on their mean report of parental psychological aggression, $F(1, 61) = 0.60, p = .371$, though Flirters had a higher mean self-report of parental psychological aggression ($M = 4.11, SD = 1.68$) than Nonflirters ($M = 3.70, SD = 1.88$).

Do Flirters have a profile of increased mating effort and aggressive, risky behaviors, as compared to Nonflirters?

Correlations. In terms of Flirting and measures of aggression, flirting was positively related to peer reports of overt aggressive behaviors ($r = .334, p < .05$), such that those who had more nominations of flirting also had more nominations as being overtly aggressive and disruptive. A similar, significant relationship was found between flirting and peer nominations of relational aggression as well ($r = .404, p < .05$), such that participants who were nominated more frequently as flirts were also nominated more frequently as acting relationally aggressive. Peer nominations of overt and relational aggression had a strong, significant correlation to one another ($r = .775, p < .05$), indicating that participants who were more frequently nominated as overtly aggressive were also more frequently nominated as relationally aggressive. There was no significant relationship between flirting behavior and adverse family background ($r = .119, p > .05$).

There was a significant relationship between peer nominations of flirting and risk taking behavior, such that the more frequently females were nominated as flirterers, the more severe self-reported problems they had with drug and alcohol use ($r = .191, p < .05$). A similar, significant relationship was found between flirting and drug frequency ($r = .229, p < .05$) indicating that the more frequently females were nominated as flirterers, the more frequently they were using drugs and alcohol. There was a modest, significant relationship between peer report of flirting and self-report of delinquency as well ($r = .230, p < .05$) indicating that the more frequently peers nominated a participant as someone who flirted, the more likely that participant reported engaging in delinquent behaviors. Other correlations between the variables of interest are presented in Table 3.

For the Flirterers their mean dating frequency was once a week, whereas Nonflirterers mean dating frequency was going out 2 to 3 times per month. Flirterers' scores on body image and appearance satisfaction were between 'mostly agree' and 'definitely agree', whereas mean satisfaction was 'mostly agree' for Nonflirterers. For physical attractiveness, Flirterers' mean score was rated by peers as 'somewhat unattractive' and Nonflirterers' mean score was rated as 'unattractive'. Flirterers were rated by peers to be 'somewhat sexually unattractive', while Nonflirterers were rated by peers to be 'sexually unattractive'. Flirterers were nominated by approximately 7 peers to be overtly aggressive, whereas Nonflirterers were nominated by approximately 3 peers to be aggressive. For relational aggression, Flirterers were nominated by an average of 10 peers and Nonflirterers were nominated by an average of 3 peers. Flirterers and Nonflirterers had similar responses in engaging in delinquent acts. They each reported engaging in these acts once in a while or 1 to 2 times per year. The other dependent variable drug problem severity was pooled and therefore has no qualitative ranges that correspond.

Table 3

Intercorrelations among Variables for Eighth Grade & Sixth Grade Controls

	1	2	3	4	5	6	7	8	9	10	11	12
1. Flirting ^a	1											
2. Dating	.174	1										
3. Overt Aggression ^a	.334	.128	1									
4. Relational Aggression ^a	.404	.175	.775	1								
5. Drug Problem Severity	.191	.244	.094	.095	1							
6. Drug Use Frequency	.229	.207	.109	.137	.814	1						
7. Delinquency	.230	.216	.173	.201	.606	.597	1					
8. Body Image Appearance Satisfaction	.102	.154	.215	.172	.036	.043	.106	1				
9. Physical Attractiveness ^a	.231	.223	.055	.081	.089	.092	.071	.079	1			
10. Sexual Attractiveness ^a	.229	.184	.035	.059	.055	.108	.075	.097	.858	1		
11. 6 th Living Arrangements	-.083	-.082	-.010	-.117	-.064	-.044	-.057	-.120	.019	.017	1	
12. 6 th parental psychological aggression	.057	.072	.115	.054	.104	.107	.197	.095	-.176	-.133	-.007	1

Note. Correlations in bold are significant at $p < .05$, 2-tailed.

^aPeer report

Multivariate analysis of variance. In order to decipher if consistent Nonflirters significantly differed from consistent Flirters on the dependent variables of interest, multivariate analysis of the variance (MANOVA) was conducted (Table 4). Flirters were compared with Nonflirters on their relational and overt aggression to investigate Hypothesis 2 and their risky behaviors in order to investigate Hypothesis 3. In order to investigate Hypothesis 5, Flirters and Nonflirters were compared on their attractiveness, both self and peer report. Multivariate

analysis of the variance was utilized because many of the outcome measures were significantly correlated (Table 3). However, by using MANOVA, some cases were excluded from the Flirters ($n = 91$) and Nonflirters ($n = 99$) original grouping. By use of the MANOVA, the cases decreased because if a participant had missing data on any one outcome measure, this participant was excluded from the multivariate analysis (Flirter, $n = 50$, Nonflirter, $n = 49$). For instance, by including the measure of frequency of drug use, the sample size was reduced from 190 cases to 107 cases. Frequency of drug use had a high, positive correlation with the subscale measuring drug use severity and this correlation was significant ($r = .81, p < .05$). It can be concluded that the subscales of drug use frequency and drug use severity overlap in what they measure. The subscale measuring frequency of drug use was dropped from further analysis in the MANOVA because it reduced the number of cases. Therefore, for total number of participants for all further analyses were 83 Flirters and 81 Nonflirters ($n = 164$). Appendix A provides a table of MANOVA results including the drug frequency subscale.

For the initial MANOVA analysis the assumption of equal covariance matrices was violated, Box's $M = 113.92, F(36, 88197) = 2.30, p < .001$. Also, the assumption for equal variance was violated because the Levene's Test of Equality was also significant for all dependent variables, with the exception of self-report body image and appearance satisfaction. Therefore, a rank transformation was conducted (Conover & Iman, 1981). A rank transformation ranks each data value with the smallest data value rank equal to 1, the second smallest rank equal to 2, and so on instead of the data being on different numerical scales for each measure. For instance, a total score on a measure may be the average of several items on a 4-point Likert scale. One participant's total response score may be a 1.17 on a scale of 1-4. If this is the lowest score that any participant received than the rank transformation will recode this

value into a value of 1. If the next highest value a participant received on a measure is a 1.20, that value would receive a rank transformation of a 2 and so on. If multiple participants' data values were the same the data values received the same numerical rank. This accounts for and resolves skewness of the distribution. Using the rank transformation on all dependent variables, the assumption of equal covariance matrices was met, Box's $M = 40.23$, $F(36, 88197) = 1.06$, $p = .373$. Levene's Test of Equality was insignificant for a majority of the dependent variables, which also signified that the assumption of equal variance was met. For three dependent variables the assumptions were violated including dating frequency, drug problem severity and peer-report physical attractiveness. It was investigated whether these three variables needed further transformations to satisfy the assumption of equal variances. One way analysis of variance was run for each of these three dependent variables, using a test that was robust to assumption violations, the Brown-Forsythe test. The F statistic on this analysis for dating, drug problem severity, and attractiveness was the identical value to the MANOVA analysis F statistic for these variables. From this, it was concluded that the MANOVA analyses could be interpreted without caution, though the assumption of equal variances were not satisfied for these three outcome measures.

Rank transformation means and standard deviations do not provide the reader with the true values for how Flirters and Nonflirters compared on each dependent variable. Therefore, the true values of means and standard deviations of dependent variables will be reported and interpreted below, with the F statistic and effect size analysis from the analysis with rank transformation. The rank transformed means and standard deviations can be found in Appendix B. A Bonferroni correction was used in the MANOVA analysis in order to control for the rate of possible Type I error because several significance tests were being conducted in the analysis.

Therefore, alpha level was computed to be .01, (8 dependent variables/.05) and F statistics were considered significant at .01 or lower. Effect size was computed for all dependent variables.

The scale used for effect size of partial eta squared is one that corresponds with Cohen's *d*.

Cohen (1988) reported that a small effect size is .01, corresponding to *d* of .2, a medium effect is .06, corresponding to *d* of .5, and a large effect is .14, corresponding to *d* of .8.

Mean frequency of self-report dating significantly differed based on the two groups of consistent Nonflirters and consistent Flirters participants, $F(1, 162) = 34.50, p < .001$. This indicated that, consistent Flirters had a significantly higher mean frequency of dating ($M = 4.67, SD = 1.48$) than consistent Nonflirters ($M = 2.96, SD = 2.01$). The effect size for this difference in mean frequency of dating was large, $\eta_p^2 = .176$.

Consistent Flirters had significantly higher mean body image and appearance satisfaction ($M = 3.48, SD = 0.82$) than Nonflirters ($M = 3.18, SD = 0.74$), $F(1, 162) = 7.04, p = .009$.

Flirters had higher mean satisfaction with their body image and appearance than Nonflirters.

Flirting groups significantly differed based on mean physical attractiveness as rated by peers,

$F(1, 162) = 15.77, p < .001$. Consistent flirting females had higher mean physical

attractiveness ($M = 4.61, SD = 3.11$) than consistent nonflirting females ($M = 2.88, SD = 1.64$).

The effect size for this difference was large, $\eta_p^2 = .089$. Consistent Flirters also had higher mean

peer ratings of sexual attractiveness ($M = 5.17, SD = 2.84$) than consistent Nonflirters ($M = 3.60,$

$SD = 1.88$), $F(1, 162) = 15.18, p < .001$. This difference also had a moderate effect size, $\eta_p^2 =$

.086.

Peer rated overt aggression significantly differed based on flirting groups, $F(1, 162) =$

46.75, $p < .001$. Mean overt aggression was higher for consistent Flirters ($M = 6.58, SD = 6.67$)

than for consistent Nonflirters ($M = 2.45, SD = 5.05$) and this difference had a large effect size,

$\eta_p^2 = .224$. Also, Mean relational aggression as rated by peers significantly differed based on flirting group, $F(1, 162) = 52.89, p < .001$. Consistent Flirters had significantly higher mean relational aggression ($M = 8.81, SD = 7.88$) than consistent Nonflirters ($M = 2.90, SD = 5.25$). This too had a large effect size, $\eta_p^2 = .246$.

Analysis of variance was used to compare means within subjects to ascertain differences among consistent Flirters on their mean relational aggression versus overt aggression. For consistent Flirters, there was a significant difference in mean nominations they received for relational and overt aggression, $F(1, 90) = 9.43, p = .003$. This indicated that consistently flirting females had higher mean peer nominations for relational aggression ($M = 9.13, SD = 8.02$) than overt aggression ($M = 7.39, SD = 7.62$).

Self-report drug problem severity significantly differed based on flirting group for participants, $F(1, 162) = 22.04, p < .001$. Consistent Flirters had significantly higher mean severity of drug problems ($M = 1.25, SD = 0.33$) than female consistent Nonflirters ($M = 1.10, SD = 0.25$) and this difference had a large effect size, $\eta_p^2 = .120$.

Participants had a significantly different mean self-report of delinquent behaviors based on flirting groups, $F(1, 162) = 13.83, p < .001$. Consistent Flirters had higher mean delinquency ($M = 1.38, SD = 0.38$) than consistent Nonflirters ($M = 1.21, SD = 0.26$). This difference had a moderate effect size, $\eta_p^2 = .079$.

Because Flirters and Nonflirters differed significantly on 8th grade overt and relational aggression, delinquency, and substance abuse, hierarchical multiple regressions were run to see if consistent flirting in 7th-8th grade predicted problem behavior in 8th grade after controlling for 6th grade problem behavior and the 6th adverse background variables of living with both parents vs. other living arrangements and harsh parenting (psychological aggression by mother and

father). Interactions between living arrangement in 6th grade and flirting, harsh parenting and flirting, and 6th grade problem behavior and flirting were also tested. Only the interaction between 6th grade delinquency and flirting was significant and thus presented in Table 7.

Table 4

Summary of Multivariate Analyses of Variances for Dependent Variables.

	Nonflirters ^a <i>n</i> = 81, <i>M</i> (<i>SD</i>)	Flirters ^a <i>n</i> = 83, <i>M</i> (<i>SD</i>)	<i>df</i>	<i>F</i> (1, 162)	η_p^2
Dating ^b	2.96 (2.01)	4.67 (1.48)	1	34.50**	.176
Body Image/Appearance Satisfaction ^b	3.18 (0.74)	3.48 (0.82)	1	7.04**	.042
Physical Attractiveness ^a	2.88 (1.64)	4.61 (3.11)	1	15.77**	.089
Sexual Attractiveness ^a	3.60 (1.88)	5.17 (2.84)	1	15.18**	.086
Overt Aggression ^a	2.45 (5.05)	6.58 (6.67)	1	46.75**	.224
Relational Aggression ^a	2.90 (5.25)	8.81 (7.88)	1	52.89**	.246
Drug Severity ^b	1.10 (0.25)	1.25(0.33)	1	22.04**	.120
Delinquency ^b	1.21 (0.26)	1.38 (0.38)	1	13.83**	.079

Note. *F* statistic and η_p^2 are based on MANOVA using rank transformed variables

^aPeer report ^bself-report

** *p* < .01

For the outcome variable (Table 5), overt aggression, model 3 best predicted overt aggression. Flirting behavior in 7th-8th grade and peer nominated overt aggression in 6th grade best predicted overt aggression in 8th grade. This was true, controlling for the dichotomized variable of living with both biological parents in 6th grade or not and receiving parental psychological aggression in 6th grade. The interaction terms did not significantly predict overt aggression.

Regarding relationally aggressive behavior (Table 6), the model that best predicted relational aggression in eighth grade included the significant predictors of living with both parents and relational aggression in 6th grade in model 3. Living with both parents in 6th grade had an inverse relationship with relational aggression in that girls who did not live with both parents in 6th grade were more likely to be nominated in 8th grade as relationally aggressive. In

models 1 and 2, flirting positively predicted relational aggression in 8th grade with a significant Beta coefficient, when controlling for 6th grade variables of family psychological aggression and living arrangements. However, after the 6th grade outcome measure was added in model 3, the flirting predictor was no longer statistically significant. None of the interaction terms predicted the outcome measure.

Table 5

Hierarchical Regression Analysis for Overt Aggression

Predictor Variables, $n = 63$	Model 1 .093**	Model 2 .076	Model 3 .192**
Flirting	.305* [3.67] (1.46)	.310** [3.72] (1.44)	.215* [2.58] (1.30)
Liveboth 6 th		-.226 [-2.72] (1.43)	-.144 [-1.74] (1.29)
Parental psych aggression 6th		-.168 [-0.57] (0.40)	-.205 [-0.69] (0.366)
Overt aggression 6 th			.460** [0.78] (0.19)

Note. Standardized Betas,[unstandardized beta], (standard errors in parenthesis), R^2_{change} . Outcome measure $M = 4.90$, $SD = 6.01$

* $p < .05$; ** $p < .01$

For self-report of delinquency (Table 7), model 4 best predicted the outcome measure in 8th grade. Significant positive predictors included self-report of delinquency in 6th grade, and the interaction term of delinquency in 6th grade by flirting when controlling for 6th grade living arrangements and parental psychological aggression. Sixth grade delinquency moderated the effect that flirting had on the delinquency outcome measure. It seems that Nonflirters low on

self-report delinquency in 6th grade had increased delinquency in 8th grade and Nonflirters high on self-report delinquency in 6th grade had a similar rate of increased delinquency in 8th grade (Figure 4). However, for Flirters, those low on delinquency in 6th grade remained low on self-report delinquency in 8th grade and those high on delinquency in 6th grade remained high in 8th grade. This provides evidence that there are two groups of Flirters in 8th grade: those who engage in delinquent behaviors, and those who do not. Also, when controlling for 6th grade delinquency, some Flirters had higher rates of self-report delinquency in 8th grade than Nonflirters.

Table 6

Hierarchical Regression Analysis for Relational Aggression

Predictor Variables, $n = 63$	Model 1	Model 2	Model 3
	.116**	.093*	.126**
Flirting	.341** [4.70] (1.66)	.322** [4.45] (1.61)	.164 [2.27] (1.63)
Liveboth 6 th		-.306* [-4.25] (1.61)	-.281* [-3.90] (1.49)
Parental psych aggression 6 th		-.010 [-0.04] (0.45)	-.007 [-0.03] (0.20)
Relational aggression 6 th			.389** [0.65] (0.20)

Note. Standardized Betas, [unstandardized beta], (standard errors in parenthesis), R^2_{change} . Outcome measure $M = 5.34$, $SD = 6.92$

* $p < .05$; ** $p < .01$

Regarding drug problem severity (Table 8), the model that best predicted drug problems in 8th grade was model 1. Flirting predicted drug problem severity with a significant

standardized Beta. However, flirting no longer predicted the outcome when controlling for 6th grade living arrangements and parental psychological aggression.

Table 7

Hierarchical Regression Analysis for Self-report Delinquency

Predictor Variables, $n = 62$	Model 1 .082*	Model 2 .062	Model 3 .085*	Model 4 .538**
Flirting	.286* [0.15] (0.07)	.261 [0.14] (0.07)	.229 [0.12] (0.06)	-2.10** [-1.13] (0.12)
Liveboth 6 th		.046 [0.02] (0.07)	.027 [0.02] (0.06)	-.039 [-0.02] (0.04)
parental psych aggression 6 th		.247* [0.04] (0.02)	.328* [0.43] (0.17)	.074 [0.01] (0.01)
delinquency 6 th			.328* [0.43] (0.17)	.136 [0.18] (0.10)
Interaction: flirting by delinquency 6 th				2.50** [0.95] (0.08)

Note. Standardized Betas,[unstandardized beta], (standard errors in parenthesis), R^2_{change} Outcome measure $M = 1.25$, $SD = 0.27$

* $p < .05$; ** $p < .01$

In summary, Flirting predicted overt aggression in 8th grade when controlling for 6th grade predictors of living arrangements, parental psychological aggression, and overt aggression (Table 5). Flirting predicted relational aggression in 8th grade when controlling for 6th grade living arrangements and parental psychological aggression, but not when 6th grade relational aggression was added to the model (Table 6). Flirting interacted with 6th grade self-report of delinquency in Table 7 to predict self-report of delinquency in 8th grade when controlling for 6th

grade family variables. In Table 8, flirting predicted drug problem severity in 8th grade before 6th grade family variables were added in model 2. The 6th grade measures of the outcome variables of 8th grade peer-report overt and relational aggression predicted the outcomes when controlling for flirting and 6th grade family variables (Tables 5-6). The 6th grade self-report of delinquency interacted with flirting to predict self-report of delinquency in 8th grade (Table 7). There was no measure of drug and alcohol use available from 6th grade in order to ascertain if it predicted 8th grade drug use.

Figure 4. Self-Reported Delinquency 6th Grade X Flirting Interaction Plot

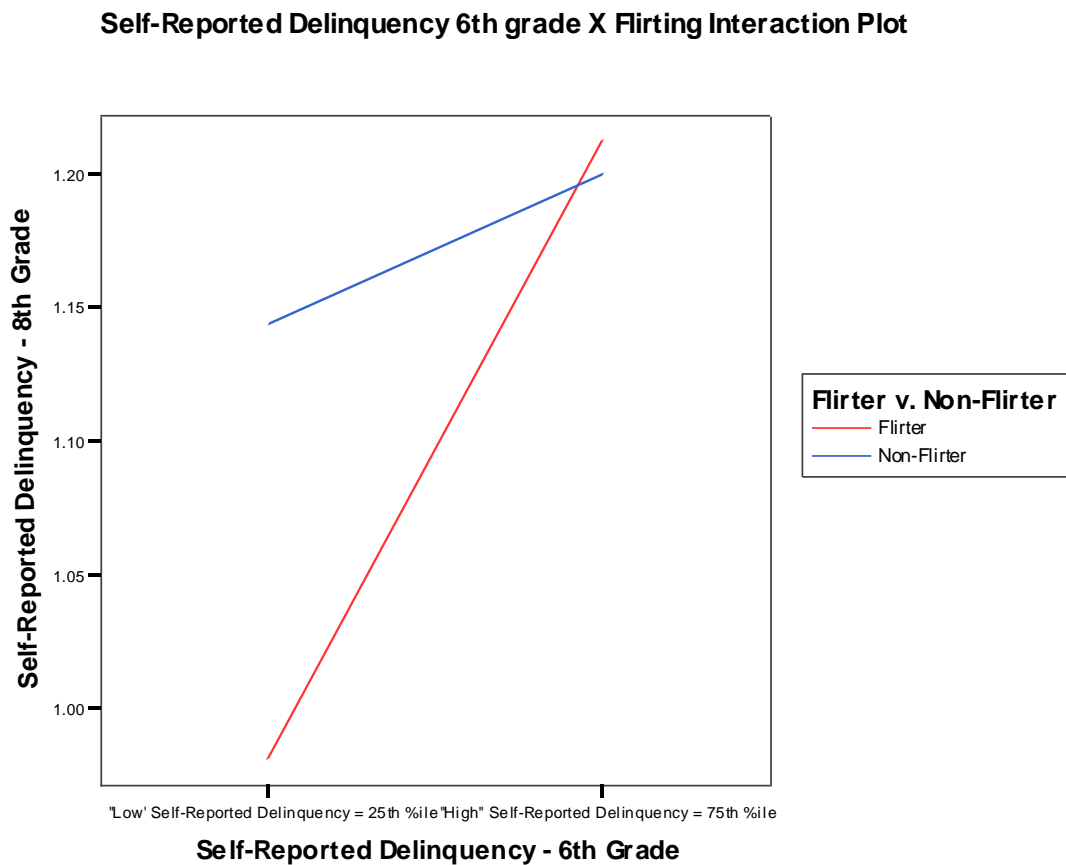


Table 8

Hierarchical Regression Analysis for Drug Problem Severity

Predictor Variables, $n = 73$	Model 1 .064*	Model 2 .036
Flirting	.252* [0.15] (0.08)	.215 [0.13] (0.08)
Liveboth 6 th		-.028 [-0.02] (0.08)
Parental psych aggression 6 th		.187 [0.04] (0.02)

Note. Standardized Betas,[unstandardized beta], (standard errors in parenthesis),

R^2_{change} Outcome measure $M = 1.16$, $SD = 0.30$

* $p < .05$; ** $p < .01$

CHAPTER IV

DISCUSSION

This study investigated the use of a peer rating of flirting as a measure of mating effort. Findings indicate that it is a valid measure of mating effort in young adolescence because flirting behavior increased with age in this sample, suggesting that it correlated with pubertal onset and it was significantly related to frequency with which participants reported dating ($\eta_p^2 = .176$). Secondly, the relationship between increased mating effort and aggressive and risky behaviors in adolescent girls was investigated. Wilson and Daly (1985) proposed a ‘Young Male Syndrome’ in which adolescent boys have a spike in mating effort and aggressive, risky behaviors. This study strongly supported the hypothesis that some adolescent girls embarked on a developmental pathway of increased mating effort, aggression, and risky behaviors in young adolescence as

consistent Flirters were significantly more likely to be nominated as overtly ($\eta_p^2 = .224$) and relationally aggressive ($\eta_p^2 = .246$) than Nonflirters. Consistent Flirters were also more likely to engage in risky behaviors including delinquency ($\eta_p^2 = .079$) and have drug and alcohol problems ($\eta_p^2 = .120$). Finally, mate value, in the form of attractiveness by peer and self-report ($\eta_p^2 = .042$) differed significantly between Flirters and Nonflirters, consistent with a previous study, showing that attractive girls engaged in more mating effort than less attractive girls. This included peer-report of physical attractiveness ($\eta_p^2 = .089$) and sexual attractiveness ($\eta_p^2 = .086$). However, when controlling for 6th grade family adversity, the problem behavior in 6th grade, and living arrangements, flirting predicted the outcome variables of overt aggression and in part, delinquency. Flirting did not predict relational aggression and drug problem severity when controlling for the family variables.

The findings strongly support peer rated flirting as a measure of mating effort. Frequency of flirting nominations was analyzed across middle school grades (6th – 8th) (see Figures 1, 2, 3). In sixth grade mean flirting nominations for girls was $M = 3.58$, $SD = 4.43$. In seventh grade girls mean flirting nominations was $M = 4.85$, $SD = 8.39$. Lastly, in eighth grade mean flirting nominations was $M = 5.19$, $SD = 7.99$. The girls' mean flirting nominations significantly increased from grade 6 to grade 7 and from grade 6 to grade 8. Flirting nominations did not significantly increase from grade 7 to grade 8. This is in line with census data on pubertal status as most girls have begun puberty in 7th grade so flirting should not have significantly increased from 7th to 8th grade. This suggests a developmental progression of mean number of nominations from peers per participant, which may begin after pubertal onset.

Correlations were examined in order to investigate hypothesis one, which predicted that mating effort grows developmentally and therefore, flirting in seventh grade would be positively

related with flirting in eighth grade. Analyses provided evidence for this hypothesis, as peer nominations of flirting in seventh grade were positively related to peer nominations of flirting in eighth grade for the sample. In hypothesis one, it was also predicted that peer nominations of flirting in sixth grade would not be significantly positively related to peer nominations of flirting in seventh grade or eighth grade. Evidence for this hypothesis was found in that for the study sample, sixth grade flirting was not significantly related to seventh or eighth grade flirting. These data were consistent with the expectation that many sixth grade participants had not undergone pubertal changes yet, and therefore had less interest in the opposite sex. Consistent flirter reported dating more frequently than Nonflirter with a large effect size ($\eta_p^2 = .176$), providing validation of peer rated flirting as a measure of mating effort. Previous research suggests that high mating effort should lead to success in mating (Buss 1988a, Buss 1988b, Rowe et al., 1997). Mating effort can be analyzed in the context of mating success, such as frequency of going on dates. This is consistent with previous research findings that mating effort correlates with mate success. It could be that for these Flirter girls that they flirted and successfully attracted dates, which reinforced them to continue flirting. The feedback they received was that their flirting led to success in attracting boys for dates. Altogether, the data provide strong support for peer nominated flirting as a measure of mating effort.

In examining the demographic variables it seems that Latina young adolescents in this study were more likely to be nominated as a flirter in both seventh and eighth than Nonflirter. There were no other significant findings with relation to race. These findings suggest a possible cultural difference for these young adolescent females in their school and community environments. It may be that in the Latina culture, flirting is modeled by older peers, siblings, and parents as a mating strategy more frequently than in other cultural populations.

Participants in the study who received free or reduced lunch were more likely to be consistently nominated as Flirters in seventh and eighth grades than to be nominated as Nonflirters. These findings suggest that environmental factors may influence the use of mating strategies during young adolescence when pubertal changes take place. This provides evidence for the theory that women of lower socioeconomic statuses utilize more aggressive mating strategies (Campbell, 1995). It also provides evidence that females who originate from adverse *environmental* backgrounds, such as an impoverished community, are more likely to flirt in middle school, which is in line with research findings that girls from impoverished communities have earlier sexual debut and several sexual partners (Gardner, et al. 2011). Familial socioeconomic status has not been used in previous research studies as a measure of adverse *family* background in assessing how family adversity influences girls' early sexual debut (Belsky et al., 2010; Ellis & Essex, 2007). However, based on the finding that more Flirters received free or reduced lunch in school than Nonflirters, perhaps it should be considered as an aspect of family adversity.

For hypothesis two it was predicted that high mating effort girls also engaged in increased aggression towards peers, as is found in the literature on adolescent boys (Charles & Egan, 2005; Rowe et al., 1997). Evidence supported this notion as Flirters in this sample were more frequently nominated as overtly aggressive by their peers than Nonflirters. For this population the developmental pathway for girls had a similar profile to Young Male Syndrome, as increased mating effort and aggressive, risky behaviors were strongly related in eighth grade. Hypothesis four, which hypothesized that flirting behavior predicted 8th grade overt aggression when controlling for sixth grade self-report of family adversity and living arrangements, was supported. Overtly aggressive girls in 8th grade utilized overtly aggressive mating strategies and

also had consistent aggressive behavior from 6th to 8th grade. This provides evidence that the adolescent girls with higher mating effort had increased overtly aggressive behaviors towards peers, which is in line with previous research (Charles & Egan, 2005; Rowe et al., 1997) and previous theoretical predictions (Campbell, 1995). The theory was not supported that adversity in family background in 6th grade predicts overt aggression or interacts with flirting to predict overt aggression in 8th grade. Previous researchers found that adversity in family led to earlier sexual debut and risky sex behaviors (Belsky et al., 2010; Ellis & Essex, 2007; Gardner et al., 2011; Mendle et al., 2009), behaviors not measured in this study, but hypothesized to be related to flirting as a measure of mating effort.

For hypothesis two, it was also predicted that Flirters in this sample were more frequently nominated as relational aggressive by their peers than Nonflirters, which was supported. When hierarchical multiple regressions were run, flirting did not predict relational aggression above and beyond family adversity and living arrangements in 6th grade as was predicted in hypothesis four. These findings do not support the theory that girls from father absent homes have higher rates of mating behavior as flirting did not account for relational aggression in 8th grade above and beyond the predictor of 6th grade relational aggression. Geary (2010) reported that girls utilize relational aggression as a mating strategy, and while this was found in model 2, flirting did not predict relational aggression above and beyond living arrangements and nominations of relational aggression in 6th grade. Previous researchers made no predictions specifically regarding the family adversity and increased relationally aggressive behaviors. From this, it can be concluded that females in the study may have also used aggression as a mating strategy. It seems that for overt aggression, flirting predicted this behavior when controlling for family adversity and living arrangements when the girls were younger. This provided more support that

these girls had aggressive mating strategies. However, this did not hold true for relational aggression. This implied that flirting behavior and relational aggression are behaviors that are related, but do not have a causal relationship. Girls who engaged in more flirting also had a higher frequency of relational aggression, but may not have specifically used relational aggression as a mating strategy. More research is needed to understand the complex relationship and motive behind young adolescent girls' mating strategies and aggressive behavior.

It was also predicted that females in this sample who were Flirters were also perceived as more relationally aggressive than overtly aggressive as previous findings support (Buss 1988b; Buss & Dedden, 1990; Geary, 2010; Leenaars et al., 2008; Walters & Crawford, 2004). This prediction was supported and provides strong evidence that those females who were Flirters utilized relational aggression as a mating strategy. These girls, similar to 'Young Male Syndrome' boys began employing the mating strategy of flirting and utilizing aggression in mating before some of their peers. Evidence supports that their use of aggression signals that they may have been most interested in short-term relationships as aggressive strategies are most often linked to short-term dating (Bleske-Rechek & Buss, 2006).

This evidence provides pertinent information regarding how girls compete with one another for opposite sex dates. Girls who had increased mating effort tendencies were overtly aggressive including physical fighting and name calling towards other girls. It is important to understand motive behind these maladaptive behaviors as they are adaptive from an evolutionary theoretical lens. Also, girls who had high mating effort engaged in relationally aggressive behavior as well. They started rumors about their female peers, excluded them from peer groups, and coaxed others to bully their competitors. It could be that their motive to engage in these behaviors was to compete for opposite sex mates.

Hypothesis three expanded on Wilson and Daly's notion of the simultaneous spike of mating effort and risk taking behaviors for girls. It included risky behaviors in the profile, such as drug use and delinquency (Lalumiere et al., 2005). Evidence suggested in this sample that consistent Flirters also used drugs and alcohol more frequently and had more severe problems with drugs and alcohol than Nonflirters. However, regarding hypothesis four, flirting behavior did not predict drug use when controlling for living arrangements and family adversity. Perhaps, flirting behavior and drug use were co-occurring for these girls, as opposed to drug use being caused by mating effort. The relationship between flirting and drug use may be explained by that the use of drugs and alcohol is considered socially "cool" and therefore may increase one's social status, which in turn improves one status as an eligible mate. Luthar and McMahon (1996) indicated that popularity was related to peer nominations of overt aggression, and it could be that drug and alcohol use is also viewed as a popular behavior by peers. Drug and alcohol use and mating effort have also been linked to mating strategies in previous research as well (Egan & Hamilton, 2008). Previous research found that early maturing girls from high household risk later developed dangerous behaviors related to alcohol use including falling down while intoxicated, binge drinking, and marijuana use (Lynne-Landsman et al., 2010). Perhaps, there is a link between early maturers, early sexual debut and mating effort, and drug abuse.

Evidence also supported hypothesis three in that Flirters engaged in more self-reported delinquency than Nonflirters and this was consistent with previous research (Charles & Egan, 2005). Regarding hypothesis four, there was partial support that flirting predicted delinquency when controlling for family adversity variables. Via interpreting the interaction between delinquency reported in 6th grade and flirting, it can be concluded that one segment of the Flirting group had high mating effort and higher rates of risky, delinquent behaviors as predicted

for adolescent boys (Wilson & Daly, 1985) and found in previous research (Charles & Egan, 2005; Rowe et al., 1997). However, not all Flirters engaged in delinquency in either 6th or 8th grade. Post hoc exploratory analyses were conducted to ascertain if the race classification of Latina and low income status affected Flirters' self-report of delinquency in 8th grade and these analyses were insignificant. Future research should assess differences between delinquent Flirters and non-delinquent Flirters.

Flirters who engaged in delinquent behavior may have done so to seem socially “cool” to desirable mates. They may also have engaged in delinquency to enhance their own mate value characteristics. For instance, a girl who has a habit of stealing may steal make-up, accessories, and clothing from department stores in order to enhance her appearance. She may steal phones, Ipods, and other devices from peers in order to appear to have financial resources that would attract a romantic partner.

There was support for Wilson and Daly's theory regarding mating effort and risky behaviors, as well as mating effort and aggressive behaviors based on the evidence provided for hypotheses two and three. As proposed, for some young adolescents, there was a simultaneous increase of flirting and aggressive, risky behaviors in eighth grade. Specifically, flirting behavior predicted overt aggression and two subgroups of Flirters were found, those that used delinquency and those who did not. Flirting did not predict relational aggression or drug use when controlling for family adversity.

Ethnically diverse females, who were consistently nominated as Flirters, had higher rates of overt ($\eta_p^2 = .224$) and relational aggression ($\eta_p^2 = .246$), drug use ($\eta_p^2 = .120$), and delinquency ($\eta_p^2 = .079$) than their peers who were consistently not nominated as flirts. Taken together, the evidence for Hypothesis 2 and Hypothesis 3, suggest that some girls are more r-selected during

the time period of young adolescence than others. This developmental trajectory may lead to earlier sexual debut and a pattern of short-term relationships. As the literature has previously connected aggressive and risky mating strategies with short-term relationship preferences, it could be that girls who began as more r-selected in young adolescence may continue on this trajectory. Though Ellis (1988) proposed that humans become more K-selected in adulthood, it could be that those adolescents on this pathway never move on the continuum to lean K-selected in adulthood. This could have implications for how much they invest in their offspring, how many offspring they have, and whether they have one long-term partner or several short-term partners in adulthood.

As found in previous research, there was also evidence for Hypothesis five, that girls high in mating effort (Flirters) had higher rates of attractiveness (Rowe et al., 1997). Flirters were also viewed as more physically and sexually attractive based on peer ratings than Nonflirters. Perhaps more attractive young adolescent girls were approached by and competed for by opposite sex peers. They may have reciprocated by also engaging in flirting and competitive behaviors and were reinforced to continue flirting based on having success in dating. Flirters also reported that they were significantly more satisfied with their appearance than Nonflirters though the effect size for this measure was smaller than in the peer-reports of attractiveness. It could be that peer-report of attractiveness more strongly reinforces the success in mating and dating whereas one's own perception of attractiveness is not as important because it does not give the girls feedback on how others view them.

There were many strengths of the study. The study included peer-report of flirting behavior, a measure of mating effort. The study also included peer-report of overt and relational aggression. This allowed for the study to include peer perceptions of participants' behaviors.

This study also included peer-report of physical and sexual attractiveness. Another strength of the study was that it included multiyear data across seventh and eighth grades and had a large sample size ($n = 164$). Finally, the study assessed young, adolescent girls and their mating effort, which is an age group that has been rarely studied in the context of mating behavior. The study included an ethnically diverse sample.

Limitations of the Study

This study examined Flirting behavior as a single construct of mating effort. There are many strategies that comprise the mating effort construct that this study did not investigate. Researchers have created measures which assess mate acquisition strategies (Buss 1988a, Walters & Crawford, 1994). These strategies enhance one's desirable characteristics to potential mates. This involves communicating to the potential mate that one would be a stable and trustworthy partner, showing off one's resources such as a well-paying job, and emphasizing attractive attributes by wearing make-up and form fitting clothing. Also this includes flirting, which draws attention to the suitor that one is sexually interested as measured in this study.

Another limitation of the study was the use of the Revised Class Play for peer report of flirting, relationally aggressive behavior, and overtly aggressive behavior. Students were given class lists in order to "cast" peers in the roles of aggressiveness and flirtatiousness. It could be that some cohorts had more or less aggressive or flirty peers than other class lists. However, by using the list that had the whole school list on it may have also posed problems because in a large school many students do not know a majority of students in their whole class. A solution could have been to allow students to "cast" someone as a flirter who was not part of their cohort.

A limitation of the study was also the volume of missing data on the drug frequency subscale. It seems that many students did not fill out this portion of the PESQ drug screening

questionnaire, though many of them filled out the severity of use subscale. It could be that students did not feel comfortable reporting on their frequency of drug and alcohol use in the classroom setting for fear that peers or their teacher would find out the results. Post-hoc analyses were conducted and it was found that those who girls who did and did not fill out the drug frequency subscale did not differ on demographic variables. However, to increase the number of cases this dependent variable was eliminated.

For the peer-report of physical and sexual attractiveness, Flirters and Nonflirters were reported to be “somewhat unattractive” and “unattractive” respectively. It could be that the peers who nominated the girls in the sample were picky or harsh in their ratings. Also, the yearbook photos that they rated were in grayscale, as opposed to color photos. It could be that the ratings were affected by the photos not being in color.

A limitation of the study was that family adversity was collected in 6th grade and consisted of psychological aggression and living arrangements at that point in time. Previous research indicates that family adversity is related to r-selected behaviors and mating strategies when the two constructed are collected at different periods of development. In previous studies, family adversity had been collected when the participants were toddler to latency age whereas the mating behaviors data were collected in young or late adolescence (Belsky et al., 2010; Ellis & Essex, 2007). Also, the adversity did not include physical aggression from parent to child or partner violence between the participant’s parents. It could be that the family adversity should include a measure of poverty or economic status as well. Economic status was not used in the operationalization of the construct based on previous researchers not including it as an adverse familial factor (Belsky et al., 2010; Ellis & Essex, 2007). Also, researchers have connected early puberty to early sexual behaviors (Belsky et al., 2010; Ellis & Essex, 2007; Lynne et al., 2007).

The study was limited in not including a measure of self-report pubertal status. A measure of self-report of start of puberty would have enhanced the ability to predict which girls embark on the developmental pathway.

Finally, the study is limited in that the measure of mating effort, peer nominated flirting, asked participants about their peers' flirting behavior with the opposite sex. It did not assess mating effort towards same sex potential mates. The generalizability of the findings is limited in that it cannot be extrapolated to populations of teen girls who engage in same sex romantic relationships. Future research should assess mating effort in same sex and opposite sex romantic relationships in order to more broadly understand adolescent mating behavior.

Future research

The current study included a peer rated measure of one type of mating effort (flirting) for adolescent girls. To better capture more subtle forms of mating effort, future studies should include measures of the differing kinds of mating effort, including self-report strategies used to directly and indirectly combat competitors. Measures can include both mate acquisition strategies and competitor derogation strategies as well. This can help to identify which strategies are used by young adolescent girls who fit the profile of having increased mating effort and aggression and which are used by those girls who do not fit this profile.

Also, for this study, overt and relational aggression were related to flirting as two separate characteristics that consistent Flirters possessed, but it is possible that these individuals utilize aggressive, high mating effort strategies, indicating a combined construct. For eighth grade females in the study, nominations of flirting were positively correlated with overt aggression, $r = .334$, and with relational aggression, $r = .404$. Future studies should analyze how and when overt and relational aggression are used as mating strategies for young adolescent

girls. Self-perceived mating success may also be a factor that influences whether these females utilize aggressive mating strategies, as this relationship has rarely been investigated. These girls may utilize a kind of strategy (i.e., aggressive or nonaggressive) multiple times if they perceive it is successful in achieving their mate goals.

This study provided evidence of a link between flirting and delinquent behaviors. Specifically the findings demonstrated a relationship between drug and alcohol use and flirting behavior for teen girls, as has been found in previous studies. However, studies have not discovered why this relationship occurs. One could speculate that girls in this study engaged in drug use to appear cool to potential mates. A follow-up study could include qualitative interviewing to investigate why these adolescent girls use substances, and how their substance use is connected to mating effort and mate success. It is also hypothesized that these girls engaged in delinquency to collect more resources and enhance appearance. In a follow-up study the specific delinquency items could be compared between Flirters and Nonflirters to analyze which items from the SRD are more frequently endorsed by Flirters.

Future research can also assess what traits and environmental factors predict flirting behavior in young adolescence. As this study utilized flirting behavior as a predictor for several dependent variables, it would be useful to analyze flirting as an outcome. It could be that the girls who engaged in high mating effort in 8th grade had early menarche compared with their peers as some studies have found (Belsky et al., 2010; Ellis & Essex, 2007; Lynne et al., 2007). Also, researchers have reviewed the bi-directional effect of early maturing girls who look older and therefore may associate with older adolescents and engage in older adolescent behaviors (Lynne et al., 2007). Here, it could be that girls who were consistently flirting in 7th – 8th grade

were treated differently by older peers because of their mating effort behaviors and were reinforced to have increased mating effort and externalizing behaviors at a younger age.

Also, in this study there was no information on the characteristics that the young adolescent girls desired in a mate. One might hypothesize that the use of aggressive strategies might be linked to desired mate characteristics in that those using more aggressive strategies might be in competition for the “best” mates with higher mate value including resources, protection, and high earning potential. However, those who are less aggressive may not attempt to find the best mates, but may settle for mates who are easily sexually accessible, or may live in an environment with many available “best” mates and do not need to fiercely compete.

In a future study, this population could be followed as they are currently emerging adults in their early twenties. There are many research studies, which support a Young Male Syndrome for older adolescents/emerging adults, but less is known regarding young adult women. Studies that have been completed regarding young adult females have primarily included populations at the university or four-year college level, whereas this population is diverse in ethnicity as well as in education status. Emerging adult women can be specifically analyzed in order to ascertain the strategies they use, and whether these strategies are aggressive and derogatory to competitors. It would be interesting to track the course of female Nonflirters and Flirters in seventh-eighth grade in order to ascertain if they continue to use aggressive strategies and engage in risky behaviors into adulthood as a way of gaining access to the best available mates. It may be the case that they continue to engage in risky and aggressive behaviors in emerging adulthood, and therefore continue to lean as r-selected into emerging adulthood. They may also have acquired unrestricted attitudes towards engaging in casual sex in order to increase their reproductive success. It may be that those girls who were identified as Flirters in 7th and 8th grade continue to use aggressive

mating strategies and engage in short-term relationships in adulthood. This may impact how much they invest in raising their children. It could be that they model these r-selected mating strategies to their children, and this cycle continues through generations of women.

Environmental factors may impact the course of these girls developmental pathway as there may be less available “good” mates and so they may need to continue to compete more strenuously for them. Or, it could be that these emerging adults settled for a mediocre mate in emerging adulthood to provide some resources and support and therefore turned to less intense mate acquisition strategies.

Familial backgrounds may affect the strategies employed by this population of emerging adult women. It could be that those exposed to harsh home environments during childhood have adopted aggressive strategies with goals of short-term mating. Those not exposed to harsh environments may employ strategies that highlight the characteristics that make them a quality mate. These females may not utilize competitor derogation or relational aggression in their mate acquisition strategies.

This study focused on antisocial behaviors of girls who frequently flirted. A future study could assess the prosocial behaviors of these girls as it is possible that while they engage in maladaptive behaviors, that they also engage in prosocial behaviors. Also, their popularity status may be a factor that contributes to their success in dating and may provide more opportunities to flirt if they are having more social interactions than Nonflirters. Post hoc exploratory analyses were conducted to assess likeability and whether these girls were prosocial leaders as reported by their classmates. These variables were measured via peer nominations in the Revised Class Play, the same assessment used for flirting and the aggressive behaviors (Masten, Morrison, & Pelligrini, 1985). Via one way-analysis of variance it was found that Flirters did not differ than

Nonflirters based on their peer nominations of prosocial/leadership behaviors $F(1, 188) = 0.24, p = .625$ though Nonflirters engaged in more prosocial and leadership behaviors ($M = 6.04, SD = 4.50$) than Flirters ($M = 5.73, SD = 4.19$). Also, there was no significant difference between Flirters and Nonflirters on how well they were liked $F(1, 188) = 1.73, p = .190$. Flirters were more well-liked ($M = 5.79, SD = 3.67$) than Nonflirters ($M = 5.06, SD = 3.95$) though this was not significant. Lastly, based on peer nominations of being liked least, Flirters were significantly more likely to be nominated as being liked least ($M = 6.40, SD = 6.34$) than Nonflirters ($M = 3.03, SD = 5.28$), $F(1, 188) = 15.93, p < .001$. These are areas to be explored further, as these high mating effort girls may have prosocial behaviors not measured here. There are many possibilities for this group of young adult females in their mating behaviors to be uncovered.

Clinical Implications

There are many clinical implications for school psychologists who work with middle school aged and older adolescent students. The research literature includes reports that adolescent girls reported being victimized by other girls as part of intrasexual competitive acts (Leenaars, L., Dane, A., & Marini, Z, 2008). Acts of repeated relational aggression may be just as harmful, if not more detrimental to its victims than physical aggression. The girls in this study who were viewed as aggressive were also more likely to flirt, thus indicating that their aggressive behaviors are mating strategies. Perhaps it is worth helping victims of relational aggression from same sex peers to understand that their competitors use derogation and relational aggression towards them in competition for mates. Victims may feel empowered by knowing this, and may be less likely to internalize subtle bullying and devalue their self-esteem and self-worth.

Understanding another source for why adolescent girls engage in severe and frequent drug use may help to prevent and/or intervene with girls who have substance abuse or

dependence. Group therapy manuals may include processing with girls how they use substances as a mating effort strategy and replace this strategy with other effective and safe strategies to interact with and compete for the opposite sex.

This study investigated a developmental pathway of girls who began flirting behavior during young adolescence and also engaged in more aggression towards peers, drug use, and delinquency than girls who did not engage in flirting in young adolescence. There is still much to learn about this trajectory and whether it is stable through young adulthood. Researchers have begun to investigate mating strategies in girls and women and have recognized that girls as well as boys engage in intrasexual competition to attract mates and dates. Here, it was found that some girls have a similar trajectory to boys who have increased mating effort and aggressive, risky behavioral patterns. More research can shed light on what factors influence which girls will be on this trajectory and how stable it is over time.

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Appendix A

Table 9

Summary of Multivariate Analyses of Variances for Dependent Variables including Drug Frequency

	Nonflirters ^a <i>n</i> = 49, <i>M</i> (<i>SD</i>)	Flirters ^a <i>n</i> = 50, <i>M</i> (<i>SD</i>)	<i>D</i> <i>f</i>	<i>F</i> (1,97)	η_p^2
Dating ^b	2.82 (2.00)	4.50 (1.45)	1	19.47**	.167
Body Image/Appearance Satisfaction ^b	3.19 (0.73)	3.47 (0.89)	1	4.33	.043
Physical Attractiveness ^a	3.06 (1.80)	5.58 (3.51)	1	15.32**	.136
Sexual Attractiveness ^a	3.51 (2.11)	5.62 (3.35)	1	11.64**	.107
Overt Aggression ^a	2.82 (5.66)	6.95 (6.96)	1	29.12**	.231
Relational Aggression ^a	3.18 (6.35)	9.66 (8.13)	1	43.82**	.311
Drug Severity ^b	1.04 (0.08)	1.23 (0.30)	1	23.20**	.193
Drug Frequency ^b	1.11 (0.22)	1.52 (0.58)	1	27.57**	.221
Delinquency ^b	1.15 (0.17)	1.35 (0.34)	1	15.45**	.137

Note. *F* statistic and η_p^2 are based on MANOVA using rank transformed variables

^aPeer report ^bself report

** *p* < .01

Appendix B

Table 10

Summary of Multivariate Analyses of Variances for Dependent Variables with rank transformations

	Nonflirters ^a <i>n</i> = 81, <i>M</i> (<i>SD</i>)	Flirters ^a <i>n</i> = 83, <i>M</i> (<i>SD</i>)	<i>D</i> <i>f</i>	<i>F</i> (1,162)	η_p^2
Dating ^b	116.65 (89.48)	192.92 (76.44)	1	34.50**	.176
Body Image/Appearance Satisfaction ^b	145.70 (90.31)	184.73 (97.77)	1	7.04**	.042
Physical Attractiveness ^a	130.57 (78.16)	184.15 (93.72)	1	15.77**	.089
Sexual Attractiveness ^a	131.64 (83.96)	185.06 (91.36)	1	15.18**	.086
Overt Aggression ^a	119.73 (77.92)	202.46 (77.02)	1	46.75**	.224
Relational Aggression ^a	109.25 (80.24)	201.10 (81.46)	1	52.89**	.246
Drug Severity ^b	142.42 (77.67)	205.03 (92.29)	1	22.04**	.120
Delinquency ^b	152.35 (96.50)	208.31 (96.22)	1	13.83**	.079

Note. All dependent variables are ranked so values do not correspond to scales on each measure.

^aPeer report ^bself report

** *p* < .01

Appendix C

Class Play

REVISED CLASSPLAY (RCP)

Below is a list of all the students in your class. We want each of you to pretend that you are the director of a play starring the students in this classroom. The director of a play has to do many things, but the most important job is to select the students who could play each part or role best. Try to pick the students who seem to fit each role in real life. You should pick at least one person for each part and you may select up to three people for each part. Since some students may fit more than one role, you may choose the same person for more than one part. That is fine, as long as you think carefully about your choices. As the director of this play, you would be too busy to play a part, so you can't choose a part for yourself. Circle the name and/or the number of the person that you feel fits the role best. Remember you can choose up to three people for each role. (Items are presented in a random order on the questionnaire.)

Prosocial/Leader items

A person who:

1. is a good leader.
2. is someone you can trust.
3. helps other people when they need it

Aggressive/Disruptive items

A person who:

1. loses temper easily
2. picks on/teases other kids
3. gets into a lot of fights

Relationally Aggressive items

A person who:

1. excludes people from being in their group of friends
2. tries to make other kids not like a certain person by spreading rumors about them
3. is too bossy

Sensitive/Isolated items

A person who:

1. rather play alone than with others
2. gets their feelings hurt easily
3. very shy
4. is often left out
5. is usually sad

Flirting item:

A person who:

1. Is overly flirtatious/comes on strong with the opposite sex

Appendix D

Self-Reported Delinquency

SELF-REPORTED DELINQUENCY (SRD)

The meaning of the numbers is as follows:

1	2	3	4
Never	Once in a while (1-2 times/year)	Pretty often (3-4 times/year)	Very often (5+ times/year)

Indicate what best describes how often you do the following behaviors. Remember only the Columbia research team will know what you write- your responses will be confidential.

1. Damaged or destroyed something on purpose that does not belong to you?
2. stolen or tried to steal a car, motorcycle, or any other major vehicle?
3. used alcohol such as beer, wine, or hard liquor (like whiskey or gin)?
4. stolen or tried to steal something that is worth more than \$50?
5. bought or sold something or tried to buy or sell something that you knew was stolen?
6. thrown objects such as rocks or bottle at car, people, or windows?
7. set fire or tried to set fire to a building, car, or other property on purpose?
8. run away from home?
9. lied about your age to get in somewhere (such as an R or X rated movie) or in order to buy something (such as alcohol)?
10. carried a hidden weapon other than a plain pocket knife?
11. stolen or tried to steal something that is worth \$5 or less?
12. attacked someone because you wanted to seriously hurt or kill them?
13. been involved in gang fights?
14. sold marijuana (pot)?
15. cheated on tests in school?
16. stolen money or anything else from parents or brothers or sisters?
17. hit or threatened to hit a teacher or other adult at school?
18. hit or threatened to hit one of your parents?
19. hit or threatened to hit other students?
20. been loud, rowdy, or out of control in a public place so that it bothered those around you?
21. sold hard drugs such as cocaine, crack, speed, or heroin, or anything else other than pot/marijuana?
22. tried to rip someone off by selling them something that had no value or it was not what you said it was?
23. used a car, motorcycle, or any other vehicle for a ride without asking the owner first?
24. used force or threats to get money or things from people?

Appendix E

History of Drug Use (Frequency)

PERSONAL EXPERIENCE SCREENING QUESTIONNAIRE (PESQ)

History of Drug Use (Frequency) – Subscale

During the past 12 months, how many times (if any):

[1=Never; 2=1-2 times; 3=3-5 times; 4=6-9 times; 5=10-19 times; 6=20-39 times; 7=40+ times]

1. Have you had alcoholic beverages (including beer, wine, and liquor to drink)
2. Have you used marijuana (grass, pot) or hashish (has, hash oil)
3. Have you used hard drugs other than alcohol or marijuana
4. Have you smoked cigarettes/use chewing tobacco
5. Have you used Ecstasy (MDMA, X, XTC, Adam, Clarity, Lover's Speed)
6. If you have used other hard drugs, circle the following drug that you have used at least once during the past 12 months.
 - Psychedelics (such as LSD, mescaline, payote, pcg, mushrooms)
 - Cocaine (coke, crack)
 - Amphetamines (such as uppers, speed, bennies; not diet pills)
 - Quaaludes (such as quads, sopors, methaqualone)
 - Barbiturates (such as downs, goofballs, yellows, blues)
 - Tranquilizers (such as Librium, Valium)
 - Heroin (smack, horse, skag)
 - Other narcotics (such as methadone, opium, morphine, codeine, Demerol)
 - Inhalants (such as glue, aerosol cans, gases, correction fluid)

The Problem Severity Scale – Subscale

Directions- This page asks about you and your experiences, including those with alcohol and other drugs. Some questions ask how often certain things have happened. Others ask if you agree with a statement. Please read each question carefully. Place an "x" under the answer that is right for you. Mark only one response for each question. Please answer every question.

Likert scale: never, once or twice, sometimes, often

How often have you used alcohol or other drugs:

1. At home
2. At places on the street where adults hang around
3. With older friends
4. At homes of friends or relatives
5. At school activities, such as dances or football games.

6. At work
7. When skipping school
8. To enjoy music or colors, or feel more creative
9. While driving a racing boat

How often have you:

10. Made excuses to your parents about your alcohol or drug use
11. Used alcohol or drugs secretly, so nobody would know you were using
12. Made excuses to teachers about your alcohol or drug use
13. Been upset about other people talking about your using or drinking
14. Lost your sense of taste for several days after using drugs
15. Gotten drugs from a dealer

When using alcohol or other drugs, how often have you:

16. Spilled things, bumped into things, fallen down, or had trouble walking around
17. Seen, felt, or heard things that were not really there
18. Spent money on things you would not normally buy
19. Found out things you said or did while using or drinking that you did not remember

Appendix F

Self-report Body Image and Appearance Satisfaction

MULTIDIMENSIONAL BODY-SELF RELATIONS QUESTIONNAIRE – APPEARANCE SCALES (MBSRQ-AS)

Please indicate how much you agree or disagree with each of the following statements.

1. Before going out in public, I always notice how I look.
2. I am careful to buy clothes that will make me look my best.
3. My body is sexually appealing.
4. I constantly worry about being or becoming fat.
5. I like my looks just the way they are.
6. I check my appearance in a mirror whenever I can.
7. Before going out, I usually spend a lot of time getting ready.
8. I am very conscious of even small changes in my weight.
9. Most people would consider me good-looking.
10. It is important that I always look good.
11. I use very few grooming products.
12. I like the way I look without my clothes on.
13. I am self-conscious if my grooming isn't right.
14. I usually wear whatever is handy without caring how it looks.
15. I like the way my clothes fit me.
16. I don't care what people think about my appearance.
17. I take special care with my hair grooming.
18. I dislike my physique.
19. I am physically unattractive.
20. I never think about my appearance.
21. I am always trying to improve my physical appearance.
22. I am on a weight-loss diet.

Please indicate how satisfied or dissatisfied you are with each of the following areas or aspects of your body.

Likert scale: very dissatisfied, mostly dissatisfied, neither satisfied nor dissatisfied, mostly satisfied, very satisfied

1. Face (facial features, complexion)
2. Hair (color, thickness, texture)
3. Lower torso (buttocks, hips, thighs, legs)
4. Mid torso (waist, stomach)
5. Upper torso (chest or breasts, shoulders, arms)
6. Muscle tone
7. Weight
8. Height
9. Overall Appearance

Appendix G

Psychological Abuse

*CONFLICT TACTICS SCALE – PSYCHOLOGICAL AGGRESSION SUBSCALE

Here is a list of things that your mother (or adult female who you have regular contact with in our home) might have done when you were having a conflict. Conflicts can be fights, disagreements, or just differences in opinion. Think about all the conflicts that you have had in the past year (both serious and not so serious) and say how often these things were done.

[1=Never; 2=Once a Year; 3=2 or 3 Times a Year; 4=4 to 6 Times a Year; 5=7 to 10 Times a Year; 6=More than Once a Month]

1. How often did your mother refuse to talk about the conflict or sulk?
2. How often did your mother shout, yell, or scream at you?
3. How often did she swear or curse at you?
4. How often did she threaten to hit you but not actually do it?
5. How often did she say she would kick you out of the house?
6. How often did she call you dumb or lazy or some other name like that?

The father items were identical except that father replaced mother and he for she.

*This scale was used to form the latent construct of Adverse Family Background

Appendix H

Demographics

Please fill in the box to indicate your response for each of the questions.

1. Are you: Male Female

2. Who do you live with most of the time? (Pick only one)

- | | |
|--|--|
| <input type="checkbox"/> Both Parents | <input type="checkbox"/> Only my mother |
| <input type="checkbox"/> My mother and stepfather | <input type="checkbox"/> Only my father |
| <input type="checkbox"/> My father and stepmother | <input type="checkbox"/> Other relatives |
| <input type="checkbox"/> Sometimes with my mother and sometimes with my father | |
| <input type="checkbox"/> Guardian or foster parent who is not a relative | |
| <input type="checkbox"/> Alone or with friends | |

3. Choose the category which best describes you. (Pick only one)

- | | |
|--|---|
| <input type="checkbox"/> Latino/Hispanic | <input type="checkbox"/> Black/African-American |
| <input type="checkbox"/> Asian | <input type="checkbox"/> White |
| <input type="checkbox"/> Biracial | <input type="checkbox"/> None of the above |

4. What do you do for lunch on school days?

- | | |
|---|---|
| <input type="checkbox"/> Bring lunch from home | <input type="checkbox"/> Get free lunch from school |
| <input type="checkbox"/> Buy lunch at reduced price | <input type="checkbox"/> Buy lunch at full price |

5. How often do you attend religious services?

- | | |
|--|---|
| <input type="checkbox"/> Once a week or more | <input type="checkbox"/> 2 or 3 times a month |
| <input type="checkbox"/> Once a month | <input type="checkbox"/> A few times a year |
| <input type="checkbox"/> Hardly ever | <input type="checkbox"/> Never |

6. What is the highest grade finished by your mother?

- | | |
|---|--|
| <input type="checkbox"/> Less than 10 th grade | <input type="checkbox"/> 10 th -12 th , but didn't graduate from high school |
| <input type="checkbox"/> High School | <input type="checkbox"/> Some college |
| <input type="checkbox"/> 4 year college or more | <input type="checkbox"/> Don't know |

7. What is the highest grade finished by your father?

- | | |
|---|--|
| <input type="checkbox"/> Less than 10 th grade | <input type="checkbox"/> 10 th -12 th , but didn't graduate from high school |
| <input type="checkbox"/> High School | <input type="checkbox"/> Some college |
| <input type="checkbox"/> 4 year college or more | <input type="checkbox"/> Don't know |