The development of human female competition: allies and adversaries

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Throughout their lives, women provide for their own and their children’s and grandchildren’s needs and thus must minimize their risk of incurring physical harm. Alliances with individuals who will assist them in attaining these goals increase their probability of survival and reproductive success. High status in the community enhances access to physical resources and valuable allies. Kin, a mate, and affines share a mother’s genetic interests, whereas unrelated women constitute primary competitors. From early childhood onwards, girls compete using strategies that minimize the risk of retaliation and reduce the strength of other girls. Girls’ competitive strategies include avoiding direct interference with another girl’s goals, disguising competition, competing overtly only from a position of high status in the community, enforcing equality within the female community and socially excluding other girls.

1. Introduction

Why should women differ from men in competitiveness? Past research focused on the greater variance in men’s reproductive success and concomitantly women’s lack of need to compete [1,2]. More recent research on non-human females demonstrates that females do indeed vary significantly in reproductive success, in some species as much or more than males do [3–5]. For humans, health, physical resources, alliances and community status influence reproductive success, but women confront unique constraints.

2. Mothers’ worries

Like most female mammals, human mothers must remain healthy and safe enough to protect their finite supply of oocytes, then later gestate and lactate. They also must provide physical resources, including food, shelter and territories, for themselves and their dependent offspring throughout their lifetimes [6–10].

(a) Allies

Human mothers benefit more than most primates from allies who provide physical resources and child care [11–13]. Compared with other great apes, human females reproduce more rapidly [14,15] and produce unusually altricial offspring [7], so assistance enhances reproductive success. Like most mammals, mothers bear primary responsibility for unweaned infants [16,17], but in humans, allo-mothers can care for older, but still dependent children [12,18]. Because women often reside patrilocally, bilocally or neolocally [19], they typically disperse from their natal families for part of their adult lives [20]. Therefore, kin are not always available [21,22]. A mate and affines who share genes with a woman’s children consequently provide valuable assistance. Besides a mother’s older children and her own mother, a mother-in-law [12,13,23] and a long-term mate [24–27] can provide physical resources, child care for weaned children and maintenance of a woman’s status in the community [16,17,28].

For both sexes, unrelated same-sex peers constitute primary competitors. Women are less likely than men to engage in cooperative group activities with unrelated same-sex peers beginning in childhood [29–31] and continuing through adolescence [32,33] into adulthood [34–39]. In hunter–gatherer,
agricultural and modern communities, young and middle-age men benefit from the support and skills of similarly aged men during hunting and warfare and other group pursuits. Men’s hunting success and intergroup victories increase the reproductive success of the whole community [35,40]. By contrast, no study has demonstrated the reproductive benefits of cooperation with unrelated women as opposed to female kin.

Nonetheless, one or two carefully chosen unrelated female friends can provide emotional support [41]; protection from and assistance with competition against rivals [42] and low cost aid with child care [38], although female kin can perform similar functions. Trusted female friends however offer respite from the high costs associated with kin, spousal and affinal relationships and share a greater investment in competing against same-age competitors by enforcing rules regulating competition. Ultimately however, a woman invests first and foremost in her own spouse, children and allomothers [12,13,38,43].

(b) Status

Across cultures, high status in the community increases both women’s and men’s survival and reproductive success, enhancing access to physical resources and valuable allies for themselves and their children [44–47]. A high biological market value in a community based on personal (e.g. energy level, attractiveness, height, sociability, toughness and generosity) and familial characteristics (e.g. resources, number of kin, community connections and skills) determine status by allowing an individual to reap benefits from and dispense punishments to other community members [48]. Women typically occupy lower status positions in the community than men however, even in the most egalitarian hunter-gatherer societies [49–51]. Forming a pair bond with a higher status mate therefore increases a woman’s status [24], especially if she lacks high-status kin [50]. High status in the community allows a woman to increase her own children’s success by reducing the reproductive potential of lower status women through harassment or harming their children [52–54].

Within the female community, status is calculated differently. Generation and age determine status among female kin [32]. By contrast, unrelated women enforce equality [41,55]. Unlike unrelated men, status is not earned through skills and allegiance to a large interconnected group [56,57]. Instead, a woman forms several separate, exclusive, one-on-one friendships within the larger female community [41,58,59]. Female friends prohibit competition by one another and other acquaintances by punishing superiority [58,60], requiring reciprocity [59] and exhibiting a low threshold for dissolving relationships when conflicts arise [61–63]. These prohibitions do not apply to relationships with kin, a spouse or affines [59].

3. Principles of female competition

Women compete to acquire resources for their kin, spouse and affines and a few trusted female friends; to protect their own and threaten other women’s alliances, especially marriages, given men’s greater interest in polygamy; and to prevent other women from reducing their family’s market value and opportunity for status enhancement in the larger community [64]. Three principles appear to underlie female–female competition. First, to protect their bodies for lifelong child care, women employ competitive strategies that reduce the probability of incurring physical harm through retaliation [9,10]. Avoidance of direct interference competition, disguising competition and competing only when there is little probability of retaliation, such as having high status in the community, all minimize chance of injury.

Second, because unrelated females rarely cooperate as a group, one woman’s success brings little benefit to the female community. Demands for equality within the female community function to impede individual women’s attempts to gain additional physical resources, valuable allies or status for themselves. High-achieving women have little incentive to invest in other women, so most women benefit from punishing striving peers. By contrast, trusted, equal friends can benefit from reciprocal investment.

Third, lack of group cooperation also underlies a more extreme strategy: social exclusion [65,66]. Ultimately, with the exception of a few selected friends, additional women in the community are prime competitors for physical resources, mates and status in the community [65]. Elimination of a non-friend by a coalition therefore reduces the number of competitors. Proximately, a coalition minimizes the probability of harmful retaliation by outnumbering the victim [67]. Female friends likely serve most readily as coalition partners in acts of social exclusion: a man would be less willing to evict a potential sexual partner, whereas female kin who differ in age from the victim would find her less threatening.

Five competitive strategies result from these principles: (i) avoid interference competition, (ii) disguise competition, (iii) compete overtly only if high-ranked in the community, (iv) enforce equality among female peers and (v) use social exclusion. Girls employ these strategies against female same-sex peers beginning early in childhood.

4. Development: who helps and who hinders?

(a) Infancy (0–2 years): staying alive and connected to a caregiver

Female infants are born more physically mature and less vulnerable than males to physical and social insults [68–70], yet most mothers prefer sons over daughters [71,72]. A mother typically makes the final decision as to whether to keep a newborn alive and how much to invest in it [73]. Although either sex can be preferred [11,73], males’ higher status translates into females’ greater vulnerability to infanticide. Currently, more than 100 million girls have been murdered in Asian and African countries [51,74]. Selective mistreatment of female infants, from outright killing to deprivation of food and medical care, continues to be widespread [51,75].

Paradoxically therefore, it is likely that a mother is both a girl’s primary adversary and ally in infancy. While a father, other kin and affines indirectly influence a mother’s decision to invest in her daughter [11,73], it is an infant girl’s mother who typically keeps her alive and healthy. Attracting her mother’s investment therefore is absolutely critical [11]. A girl’s direct competitors are current or future brothers, and older sisters. Establishing a bond rapidly with a mother and other caregivers is critical.

A female newborn may compete for her mother’s investment by being easier to care for and more interactive than her brothers [76–78]. Parents tolerate crying less in female than
female infants: female infants are viewed as weak if they cry, whereas the reverse is true for males [79]. From birth, female neonates exhibit fewer negative emotions, less intense activity [80–82] and greater self-regulation [83]. Further, compared with males, female infants look more at a caregiver’s face [84] and more accurately identify adult emotions [85]. They also smile more and make more eye contact [86,87]. When they become mobile, they remain in closer proximity to their mothers [88,89]. By 14 months, female infants comply more than males with parental requests [90–92].

(b) Early childhood (2–5 years): learning to assist with and obtain assistance from kin

The relationship between a girl and her mother and other female relatives may be the emotionally closest and most enduring that exists [19,23,93–96], especially if a girl lives unxorilocally after marriage. Across diverse cultures, compared with boys, in early childhood, girls offer more assistance to mothers with child care and domestic responsibilities [21,95]. Beginning at age 2, girls mind younger siblings, and at all ages girls are more interested than boys in babies [97].

Reciprocally, in natural settings across cultures girls are more likely than boys to seek assistance from mothers and other adults [98]. Experimentally, 3- to 5-year-old girls requested more assistance from an adult than boys on structured tasks [99–101]. Cross-culturally, mothers talk more and use more supportive speech with daughters than sons [102], and daughters remain physically closer to mothers than sons do [95,103]. For girls, proximity to adults facilitates resource acquisition [104]. In preschool settings, the more same-sex peers present, the closer 3- to 5-year-old girls remain to adults, whereas the converse is true for boys [105]. A supportive mother or substitute female adult therefore likely exerts the greatest influence on a young girl’s ability to satisfy goals without incurring high costs.

When female adults are occupied, a girl spends time however with unrelated female peers owing to their common interests and because unrelated boys can be dangerous [106]. Further, from birth onwards, unrelated boys exhibit differing interests than females [84], so that mobile girls and boys segregate themselves spatially [107]. Unrelated girls who share goals and strategies, but no genetic interests, constitute both a girl’s companions and primary competitors.

In naturalistic settings, after 2 years of age, girls often avoid boys, most probably owing to boys’ rougher play styles [107–109]. At 33 months, when unfamiliar female and male peers were paired, girls were more likely to withdraw, behave passively, cry and seek proximity to their mothers when playing with a boy than a girl [110]. Between 2 and 3 years, cross-culturally boys begin to denigrate girls [95,111–113].

By age 4, despite similarities in size and strength, girls cede physical resources to boys. In a study of resource utilization, a child could view movies if another child pressed the light, and a third child turned a crank [114]. When groups of two girls and two boys were formed, girls viewed the movies less than one-third as much as boys did. Even the toughest girls viewed the movies less than boys. Boys’ physical attacks, displacement, threats and commands deterred girls.

When mixed-sex pairs of 3- to 5-year-old children operated the movie viewer, and no assistance with the light or crank was required, girls likewise gained less viewing time [104]. When a passive adult was present however, girls insisted on longer turns. Young girls rely on adults to protect their interests more than boys do, remaining closer to preschool teachers [115] and mothers [103]. Ultimately, however, girls compete against other girls, not boys.

(i) Avoid interference competition

Frequency of physical aggression peaks between 2 and 4 years for both sexes, but girls are less aggressive [116–118]. Whereas girls use physical force to resolve conflicts over possessions and space earlier than boys, after 24 months girls use less bodily force (pushing, pulling, kicking or hitting the peer’s body) than boys in conflicts over resources or territory [119–121]. Girls also are less likely than boys to directly verbally interfere (command, threat, prohibit or heckle; [60,122,123]). Instead, they use more subtle competitive strategies.

(ii) Disguise competition

Better disguised forms of competition minimize retaliation. Girls use complex verbal and non-verbal tactics and physical movements that appear non-competitive on the surface. By age 3, girls far more than boys emphasize their caring and egalitarian natures [124,125], and ‘niceness’, which means concealing their goals [126]. ‘What girls learn to do with speech is cope with the contradiction created by an ideology of equality and cooperation and a social reality that includes difference and conflict’ [60, p. 205].

Young girls’ ‘double voice discourse’ disguises conflicts over resources by expressing anger quietly, using false voices attributable to others to make demands, suggesting postponement of equal outcomes and shifting attention to cooperation from conflict [127]. Smiles, politeness (‘I’m sorry ‘thank you’), qualifiers (‘maybe’ ‘probably’ ‘yes, but’), questions rather than direct commands (‘Will you do this?’), statements that include tags (‘It is mine, right?’), inclusion of antagonists (‘Let’s do this’) and other ways of mitigating or softening conflict constitute girls’ primary means of obtaining goals [123,127]. Further, girls are more likely than boys to express agreement, allow a speaker to finish, acknowledge the prior speaker’s words and provide justifications that connect rather than oppose others’ views [122,128]. Girls ‘possess verbal negotiation skills that enable them to confront without being very confrontational; to clarify without backing down; and to use mitigators, indirectness, and even subterfuge to soften the blow while promoting their own wishes’ ([127], p. 61).

To illustrate, a triad of 3-year-old girls was attempting to gain a valuable resource, a pickle, in their preschool kitchen:

Sue: And strawberries for dinner, right?
Mary: And the- this for dinner. (Mary puts the pickle in a pot on the stove)
Sue: And the pickle. Do you like pickle? (Sue takes the pickle out of the pot)
Mary: And this (the hamburger) is for dinner. (Mary pulls the hamburger and pickle out of Sue’s hand and puts them back in the pot)
Sue: No, they aren’t for dinner, no, Lisa wants pickles. (Sue tries to grab the hamburger and pickle back from Mary but she holds on and puts them back in the pot) ([129], pp. 16–17)

By contrast, boys compete overtly:

Kevin: (at the table) Pickle. (takes the pickle)
Nick: I’m cutting- I’m cutting- No, I have to cut that! (Nick tries to take pickle back from Kevin)
(iii) Compete overtly only if high ranked in the community
Girls with high status in the community can compete more directly, because the threat of retaliation is lowered. In preschool dyadic resource conflicts, compared with boys, girls use less physical aggression and submit more. A few girls with high status in the class however refused to back down [130,131].

Lisewski, when the movie viewer study was repeated with 4-5-year-old children in same-sex groups of four [132], girls’ and boys’ groups gained equal viewing time. Girls’ groups were less egalitarian however than boys’ groups: one girl dominated and another girl was not allowed to participate. Dominant girls who viewed the most movies used more commands, physical force, blocking, pushing and disruptions than girls who never viewed the movies. By contrast, boys who viewed the movies the most and least did not differ in verbal or physical tactics. Overall, however, girls used less bodily force or physical contact than boys did.

Similarly, high status more than low status 4-5-year-old Turkish girls obtained the best roles during pretend play, then issued more commands and directives to other girls [133]. American 3-year-old girls follow the same strategy: one gains a superior ‘pretend’ role, then commands others [134]. Only a high-status girl dispenses with egalitarian behaviour, which she resumes when a similarly high-ranked girl enters [125].

(iv) Enforce equality among girls
Eliminating all uneven resource distributions and status differentials provides an effective counterstrategy. Linguistic researchers conclude that ‘a girl cannot assert social power or superiority as an individual’ (p. 205) without risking other girls’ denigration [133]. By age 3, girls enforce equality. Compared with boys, across diverse cultures girls avoid employing signifiers of high status with same-sex peers, including commands, boasts, provision of information or joke-telling [60,122,133]. Another movie viewer study with same-sex groups of four 3- to 5-year-olds demonstrates girls’ dislike of superior girls: those girls who took control and viewed the movies longest were less liked by all their female classmates than those girls who rarely viewed the movies [135]. The opposite was true for the boys.

(v) Use social exclusion
Exclusion constitutes a more extreme strategy. By age 3, compared with boys, girls more often disparage a same-sex peer in conversations [136,137]. Experimentally, when same-sex triads of 4-year-olds received only one valuable resource, girls were more likely than boys to use social exclusion in which two friends ganged up on the third. By contrast, boys individually directly attempted to grab the resource [138].

(c) Middle childhood/juvenile period (5-12 years):
developing an intimate, exclusive, reciprocal bond with another girl
Cross-culturally, responsibility for the care of younger siblings increases in middle childhood [95,139]. Further, when enough unrelated children are present, universally girls interact almost exclusively with other girls, and not boys [95,107,140]. Segregation by sex occurs partially because boys avoid [113,141] and bully [142] girls. When unsupervised by adults, girls allow boys to dominate them across domains and cultures [143]. Other girls also provide a respite from familial responsibilities, share similar interests and provide emotional support [41].

Girls form an intimate, exclusive friendship with another girl, isolated from other girls [55,144]. Two girls bond through reciprocal verbal discussions of similar personal vulnerabilities, particularly concerns about alliances with other girls and family members [41]. Unconditional acceptance, exclusivity and loyalty further define the middle childhood female friendship [63,145]. Imagining its potential dissolution generates feelings of devastating loss [146], foreshadowing a commitment to a long-term heterosexual bond.

Despite their appeal, isolated female pair bonds are not destined to last and frequently endure for shorter periods than male friendships that are embedded within a larger group [144,146-148]. Further, the intimate, repetitive discussions of personal difficulties between girls can promote negative emotions, including depression [149]. Consequently, across cultures in middle childhood girls continue to rely on and maintain proximity to mothers, female relatives, teachers and other female adults [37,95,150,151].

Competitive strategies of early childhood become accentuated between girls in middle childhood as they vie for a female friend [152]. Initiation and preservation of female friendships require continually expelling interlopers and enforcing loyalty, exclusivity, reciprocity and equality. Girls tolerate conflicts less than boys with same-sex friends, as they proceed from one female partner to the next searching for another girl who meets the requisite standards [61,63,153]. Even though female bonds are the focus in middle childhood, the highest status girls in the community begin to evaluate specific boys as potential mates [141].

(i) Avoid interference competition
Across cultures, girls continue to use less direct physical and verbal (yelling, cursing or extreme hostile language) aggression than boys [116,118]. In school competitions, a girl competes primarily against herself, as in jump rope, hopscotch, exercise or academics, whereas boys engage in zero-sum activities that require actively interfering with another’s goals [30,154].

Experimentally, when 10-year-old children played interference and non-interference versions of the same game in groups of four same-sex peers, compared with boys, girls avoided interfering with another’s goals [155]. Girls physically removed another child’s tokens, only when it was necessary to win a prize, and then they averted their gaze. When winning did not require taking another’s tokens, girls avoided it. By contrast, boys took their same-sex peers’ tokens, regardless of whether it improved their own probability of winning. Likewise, when groups of four 6- or 9-year-old same-sex children were asked to choose a leader, no sex differences occurred in length of negotiations. Girls however exhibited more discomfort than boys during negotiations, and for girls, the longer the negotiations, the greater the discomfort [156].

(ii) Disguise competition
When possible, disguising competition is safer than competing overtly [60]. In same-sex conversations, compared with boys, girls use half as many assertive or dominating speech acts designed to control a same-sex peer’s behaviour [157]. Further,
girls use more affiliative speech acts than boys, including provision of information or invitations to play. Likewise, when same-sex pairs of 10- to 14-year-old close friends played a game with a same-sex confederate who was trained to criticize, boast, boss and otherwise behave unpleasantly, girls made fewer aggressive and assertive statements than boys to the confederate [158]. Instead, girls made more subtle aggressive non-verbal facial and bodily non-contact gestures than boys.

Similarly, when 11- to 12-year-old Finnish children described the behaviours of same-sex classmates whose goals were thwarted, girls reported more instances than boys of disguised competition, including telling an untruth behind the target’s back, becoming another’s friend to take revenge on the target, telling others not to be friends with the target, sulking, putting the target to the side, pretending not to know the target and remaining angry [159]. By contrast, girls reported fewer instances of direct interference with a target’s goals, including tripping the target, taking the target’s objects, swearing at the target, kicking, hitting or Shermaning the target, and repeated expressions of anger. Likewise, in 17 classrooms of 11- to 15-year-old British schoolchildren, compared with boys, girls reported more gossiping and dirty looks and less making fun of others and hitting [160].

(iii) Compete overtly only if high ranked in the community

When overt bullying occurs, high-status girls bully lower status girls, just as high-status boys bully lower status boys [142], though girls are less likely to bully than boys [161]. More commonly, high-status girls use less overt strategies. Across diverse cultures when girls assist mothers in domestic chores, ‘pro-social dominance’ is used by older girls to control younger siblings’ behaviours [95]. By extending this strategy to pretend to hold a position of authority with unrelated same-age girls, a girl can dominate others and pursue her own interests. For example, ethnographic research in an African–American working-class neighbourhood demonstrated that girls attempted to control one another by assuming the mantle of an authority figure, such as a mother or teacher [162].

(iv) Enforce equality among girls

In response, girls denigrate superior-acting girls. Girls evaluate one another in terms of ‘niceness’, that is lack of competitiveness, whereas boys like high-status, competitive boys [56,163]. For example, 10- to 11-year-old American girls engaged in activities where everyone played the same role, such as turn-taking games or jump rope, with no winners acknowledged, whereas boys played zero-sum team games, with role and status differentiations, after which winners celebrated [30]. Likewise, working-class 8- to 15-year-old African–American girls disparaged superior-acting girls, whereas boys continually vied to be superior [162]. Experimental investigation of 6- and 10-year-old children’s responses to attaining higher in same-sex dyads showed that victorious girls exhibited more discomfort than boys after winning a game [156]. Most directly, when a same-sex confederate displayed high-status behaviours, such as boasting and bossing, compared with boys, girls rated the confederate as meaner and themselves as angrier at the confederate [158].

(v) Use social exclusion

Any lone girl risks ostracism, but superior-acting girls are particularly attractive victims. Social exclusion in middle childhood typically consists of female friends forming an alliance to eject a lone target from the community [162]. A longitudinal, naturalistic study of same-sex triads of 9- to 12-year-old American schoolchildren demonstrated that more female than male triads excluded one member to form a pair bond [164]. Experimentally, when a same-sex newcomer was introduced to pairs of 6-year-olds, initially girls were more likely than boys to ignore, avoid and refuse to interact with the newcomer [165]. Likewise, 8- to 12-year-old children nominated more girls than boys as using social exclusion and threats to end a friendship [166]. Finally, in a study of 10-year-old British children who competed to create a drama to win a monetary award, more female than male groups ganged up on a lone individual in their same-sex groups [167].

(d) Adolescence: finding a mate, bearing a child

Humans of both sexes experience an extended period of adolescence [14,168]. Girls’ adolescence however is briefer [15,169], requiring earlier acquisition of adult skills. In 40 developing countries, 50% of girls marry before age 18, and for 75% first births follow within 2 years [170]. By contrast, men often marry after age 30. Age at first marriage strongly influences life histories of both a girl and her children [170], in part because women are up to three times less likely than men to re-marry [6,49,171]. Consequently, a woman’s first marital partner is much more important than a man’s. Further, unlike boys, girls appear sexually mature well before they become fecund [15,169], increasing pressure on girls to marry early [172].

In adolescence, girls’ primary allegiance switches from natal kin to a husband and first child, with an intimate female friend bridging the transition. Where a girl resides matrilocally, the transition is eased [50]. Cross-culturally, when possible girls and young women remain closer to their mothers, other female kin and natal kin [32,95,96] and rarely aggress against older kin or affines [54]. Across 173 cultures, adolescent girls spent more time than boys in close proximity to intergenerational familial members, assisting with domestic chores [32]. In adolescence and adulthood, compared with males, girls and women still view parents and parental substitutes as more important than an unrelated close friend for providing both instrumental and emotional assistance [37]. Adolescent girls more than boys ask medical and psychological personnel, teachers and other authority figures for assistance [173]. Even in polygynous marriages, a newlywed female occasionally brokers an agreement with an older co-wife, in which the new wife provides medical care to the older wife in exchange for the older wife’s assistance [53]. A few trusted female friends who meet the requisite standards can provide emotional support [41] and serve as allies targeting rivals, or reciprocally as a bulwark from rivals’ attacks.

Nonetheless, in most societies, a husband becomes a girl’s primary ally, providing physical resources, alliances and community-wide status for a woman and her children. Even though husbands dominate and even abuse women [51], a woman’s reproductive success may be most influenced by her husband’s connections and status. As researchers who study the Tsimane conclude, ‘A good mate can mean the difference between a lifetime of support vs. a lifetime of fending for one’s self and one’s children’ ([174], p. 203). Accordingly, Ache women devoted 55% of their total time foraging exclusively to helping their spouse [38].
As earlier, adolescent girls avoid competing against boys. Experimentally, when early adolescent Hopi Indians and African–Americans competed, girls lost to boys [175]. Likewise, older adolescent European–American girls let boys dominate during dyadic [176] and group activities [177]. Instead, girls compete against other girls for a valuable mate. Although two girls can support one another emotionally, as well as form protection from and coalitions against a rival, co-rumination about relationships increases depression and anxiety markedly in adolescence [178]. Further, girls betray one another to form bonds with boys. Girls report greater anger, hurt and jealousy than boys towards close same-sex friends [179], especially if they were abandoned for a romantic partner [174,180]. Across 137 societies, 91% of women's competitive acts were targeted towards women, most frequently over men's attention, emotional investment, goods, services and sexuality [53,54,174], but also over broken social obligations, meat theft and friendships in which one young woman allied with another one against her former friend.

**Avoid interference competition**

Adolescent girls across diverse cultures still rarely directly interfere with another female's pursuit of her goals [32,116], even eschewing zero-sum sports games during exercise or individual athletic activities [181]. Although serious physical interference competition peaks for both sexes between 15 and 25 years, females use it 1/10 as often as males [106,116,182]. Young women's use of violence across cultures typically occurs when her own or her children's survival is jeopardized [54], in the absence of kin [50], when mates and resources are in short supply [183–185], when co-wives share a husband [53] and where marriages are not arranged [52].

**Disguise competition**

More commonly, competition is disguised so thoroughly that the competitors themselves are not even conscious they are competing [126]. Girls compete frequently through attempts to control other girls' romantic relationships [186]. Across cultures, girls' manipulation of another girl's alliances with same-sex and other-sex peers increases in frequency and intensity in adolescence compared with earlier and relative to boys [116,187–189]. Girls specifically attempt to end romantic partnerships by maligning another girl [163], often through denigration of the other girl's sexual reputation to a potential spouse [190,191]. Through denigration of female peers, a girl reduces the number of serious competitors for a mate. Records of conversations of pairs of older adolescent girls and boys showed that a higher proportion of girls' conversations contained negative statements about a same-sex peer [192]. Further, female conversational partners were more likely than male partners to respond positively to an initial denigration. Reputation denigration of a female competitor provides a powerful tool to increase a girl's own chances of finding a valuable mate.

**Compete overtly only if high ranked in the community**

Across diverse cultures, attributes considered markers of females' reproductive success, including appearance and energy level, as well as access to physical resources (high-socioeconomic status), determine a girl's attractiveness to potential mates and define high status in the community [24,163,193]. Studies of Canadian and American adolescents showed that both high-status girls and boys used overt and disguised forms of aggression more often [142,188,194] and in the Netherlands were more likely to be bullies, although girls bullied less than boys [195]. Similarly, high-status British adolescent girls occasionally physically harmed and often overtly manipulated the social relations of lower status girls in order to control access to high-status boys [145].

**Enforce equality among girls**

High-status adolescent girls elicit more respect from other girls than in earlier years, because the community of girls is more spatially connected to the male community than before. Lower status females who form alliances with high-status females theoretically can increase their access to valuable mates. Adolescent girls consequently compete more than boys to form bonds with high-status same-sex peers [163,196]. A lower status girl will surrender all her other friendships and accomplishments in an attempt to form a bond with a high-status girl. Practically, this rarely produces pay-offs, as a high-status girl profits little from allying with anyone but another high-status girl [163,196].

This produces even stronger denigration of high-status adolescent girls than earlier [196]. Within the girls' peer group, high-status girls who interfere with another girl's goals invite derision and social exclusion [162,163,193,196]. Niceness and equality remain the female community's norms. Girls' primary justification for being mean is that another girl is acting superior. Even in the rare girl gangs that exist, the leader must behave as an equal [184].

In the Netherlands, in an implicit association computerized task, girls approached the names of same-sex high-status early adolescents more slowly than low status adolescents, whereas the reverse was true for boys [195,197]. Likewise, high status and liking were unrelated or negatively related for early and middle adolescent American girls, but positively related for boys [198,199]. Further, high status at ages 15–16 years predicted lack of liking 2 years later for girls, but liking for boys. Likewise, Canadian girls reported feeling greater jealousy than boys if a same-sex friend were more successful [179]. Reciprocally, American [126] and Canadian [200] girls were more likely than boys to believe that if they were more successful than a close same-sex friend at making a new same-sex friend, excelling in academics or athletics or forming a romantic relationship, they would be less liked by their same-sex friend. The sex difference was strongest for finding a romantic partner.

**Use social exclusion**

Girls with high status in the community can more easily socially exclude lower status girls, because they attract more female and male allies. Ethnographic studies in American, English and Australian schools demonstrate the common use of both overt and disguised social exclusion by high-status adolescent girls as they attempt to ostracize one another, lower status girls and newcomers [145,201–203]. If lower status girls can form a temporary large group however, they can exclude a lone high-status girl [162]. This is even more true if they can elicit the support of the larger community, meaning boys [201,202].

Experimentally, when pairs of same-sex American young adolescent friends were introduced systematically to a same-sex newcomer, compared with boys, girls rated the newcomer less positively, took longer to speak to the newcomer and incorporated fewer of the newcomer's ideas [204]. Likewise, older...
adolescent French Canadian girls were more likely than boys to use social exclusion in a computerized game [42], and Canadian girls reported being socially excluded more frequently than boys [65].

5. Conclusion
In summary, from early childhood through old age, human females’ reproductive success depends on provisioning, protecting and nurturing first younger siblings, then their own children and grandchildren. To safeguard their health over a lifetime, girls use competitive strategies that reduce the probability of physical retaliation, including avoiding direct interference with another girl’s goals and disguising their striving for physical resources, alliances and status. When a girl has high market value in the community, she is afforded greater protection and can compete more openly without fear of retaliation. Within the female community, girls reduce competition by demanding equality and punishing those who openly attempt to attain more than others. Social exclusion by several girls of lone female victims provides a safe strategy for increasing physical resources, allies and status opportunities by decreasing the number of competitors.

Girls reach adulthood earlier than boys, frequently marrying and bearing their first child before age 20. Because they will re-marry less often than boys, produce children faster and bear primary responsibility for young children, girls have less opportunity than boys to change the course of their reproductive careers. By late adolescence, a girl’s success in finding a valuable spouse can influence her entire reproductive career. Forming alliances with kin, a few trusted female friends, then a spouse and affines, while reducing the power and number of female competitors, enhance the probability that a woman’s children and grandchildren will prosper.

References


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