

### Original Article

## Sport Participation Influences Perceptions of Mate Characteristics

Albrecht I. Schulte-Hostedde, Department of Biology, Laurentian University, Sudbury, Canada. Email: [aschulte@hostedde@laurentian.ca](mailto:aschulte@hostedde@laurentian.ca) (Corresponding author)

Mark A. Eys, Departments of Kinesiology/Physical Education and Psychology, Wilfrid Laurier University, Waterloo, Canada

Michael Emond, Department of Psychology, Laurentian University, Sudbury, Canada

Michael Buzdon, School of Human Kinetics, Laurentian University, Sudbury, Canada

**Abstract:** Sport provides a context in which mate choice can be facilitated by the display of athletic prowess. Previous work has shown that, for females, team sport athletes are more desirable as mates than individual sport athletes and non-participants. In the present study, the perceptions of males and females were examined regarding potential mates based on sport participation. It was predicted that team sport athletes would be more positively perceived than individual sport athletes and non-participants by both males and females. A questionnaire, a photograph, and manipulated descriptions were used to gauge perceptual differences with respect to team sport athletes, individual sport athletes, and extra-curricular club participants for 125 females and 119 males from a Canadian university. Both team and individual sport athletes were perceived as being less lazy, more competitive, and healthier than non-participants by both males and females. Interestingly, females perceived male athletes as more promiscuous than non-athletes, which upholds predictions based on previous research indicating (a) athletes have more sexual partners than non-athletes, and (b) females find athletes more desirable as partners than non-participants. Surprisingly, only males perceived female team sport athletes as more dependable than non-participants, and both team and individual sport athletes as more ambitious. This raises questions regarding the initial hypothesis that male team athletes would be perceived positively by females because of qualities such as the ability to cooperate, likeability, and the acceptance of responsibilities necessary for group functioning. Future studies should examine similar questions with a larger sample size that encompasses multiple contexts, taking into account the role of the social profile of sport in relation to mate choice and perception.

**Keywords:** athlete, sexual selection, individual quality, status

---

## **Introduction**

Sex differences in reproductive strategies are often ascribed to the profound differences in parental investment that males and females typically make (Trivers, 1972). Parental investment is defined as any effort that raises the chance of offspring survival at the cost of future reproduction by the parent (Trivers, 1972). In the context of mammals, where females generally invest more in reproduction than males, females are predicted to be more discerning in their choice of a mate relative to males (Clutton-Brock and McAuliffe, 2009). Thus, females tend to select mates based on genetic and/or material benefits (e.g., resource-holding potential), and males tend to mate with most females encountered (Andersson, 1994).

In humans, although males and females may both benefit by choosing their mates based on specific criteria, females invest more heavily in reproduction than males and are thus expected to exercise stricter choice (Buss, 2006). The types of traits that females use as cues of male quality include facial attractiveness and physique (Fink and Penton-Voak, 2002; Fredrick and Haselton, 2007). Males may choose females based on physical attractiveness and perceived fertility (e.g., waist-to-hip ratio; Singh, 1995; Singh and Singh, 2006). Perceptions based on physical cues (e.g., physique, attractiveness, etc.) can also lead to conclusions regarding the personality, social status, and financial success of others. For example, attractive individuals are judged, at least initially, as possessing more positive characteristics such as being “happier”, “more sensitive”, and “more confident” than less attractive individuals (Gross and Croften, 1977). Attractiveness also influences impression formation in terms of perceived marital competence, professional happiness, and occupational status, with more attractive individuals judged to be more likely to marry, be happier, and have higher status occupations than less attractive individuals (Dion, Berscheid, and Walster, 1972). Thus, perception of individual quality based on physical cues can play an important role in mate selection.

The use of cues to form impressions or perceptions and thus influence mate choice may extend to a broad range of contexts that allow the evaluation of the quality of a potential mate. As an example, there is ample evidence to suggest participating and excelling at sport can influence mate competition and selection. For example, females prefer males with athletic physiques relative to average physiques (Dixon, Halliwell, East, Wignarajah, and Anderson, 2003; Li and Kenrick, 2006; Singh, 1995). Specifically, females prefer the V-shaped torso that males concomitantly focus on by enlarging their upper body and gaining muscle through exercise (Jonason, 2007). Performance in sport can thus serve as an honest signal of physical condition and ranking among other competitors relative to athletic ability, motivation, and competitiveness. Individuals who are successful in a sporting context may thus be more desirable as mates.

The importance of sport in general, and specifically the level and type of sport performance, for mate acquisition were highlighted by two recent studies. Faurie, Pontier, and Raymond (2004) compared the number of self-reported sex partners by male and female athletes to those of non-athletes. On average, both males and females who participated in sport reported more sexual partners than non-participants. In addition, the *level* of sport achievement affected the number of self-reported partners, with more partners

reported by both males and females who had performed at a high level (national and international competition) of sport than those who participated in lower level sport (Faurie et al., 2004). Schulte-Hostedde, Eys, and Johnson (2008) argued that the *type* of sport that an individual participates in may also influence female mate choice. Indeed, females found males who participated in team sports more desirable than both males who participated in individual sports as well as non-sport participants with respect to long and short term relationships.

In the present study, the recent work conducted by Schulte-Hostedde et al. (2008) was extended to investigate whether perceived characteristics of others are attributed differentially based on sport participation (i.e., to determine *why* team sport athletes were viewed as more desirable than individual sport athletes and non-participants). While hypotheses related to physical cues (i.e., physique, strength, agility) offer possible explanations for sport vs. non-sport differences, they fall short in explaining mate choices between team and individual sport participants. The previous work by Schulte-Hostedde et al. offered specific hypotheses, tested in the present study, as to why females may have more favorable impressions of team sport athletes than individual sport athletes and non-participants. First, a male's successful and continued involvement in teams/groups may suggest positive qualities such as a willingness to cooperate, likeability, and the acceptance of responsibilities necessary for group functioning; all characteristics that could be ultimately viewed as indicators for better parenting and willingness for long-term commitments. Second, given the North American context of the previous study and the culture's focus on lucrative sports such as football/basketball/hockey, the possibility that team sport involvement triggers perceptions of greater future earnings was also recognized; albeit to a lesser degree.

A second extension of the present study to previous research (Schulte-Hostedde et al., 2008) is the examination of *male perceptions* of females based on sport involvement. While the previous study did not try to determine whether male mate choice was influenced by females' participation in sports, previous research found female athletes tend to have a lower waist to hip ratio and body mass index (Malina, Bouchard, and Bar-Or, 2004), which are considered attractive to males (Furnham, Petrides, and Constantinides, 2005). Thus, the objective was to determine if perceptual differences also exist based on female sport involvement and, if so, whether these differences display a similar pattern to male sport involvement.

Finally, underlying the prediction that athletes are desirable as mates are other traits that can influence mate choice via positive perceptions. Physical attractiveness and status are important factors that have been found to influence mate preferences (Bereczkei, Voros, Gal, and Bernath, 1997; Li et al., 2002; Rhodes, Chan, Zebrowitz, and Simmons, 2003; Rhodes, Simmons, and Peters, 2005). In the present study, an attempt is made to understand the relative contribution of sport participation to perceptions of individual characteristics in light of attractiveness and status differences.

## **Materials and Methods**

### *Participants*

Participants in the present study consisted of 125 females and 119 males from a Canadian university who ranged in age from 18 to 25 years (Male  $M_{\text{age}} = 19.47 \pm 1.51$ ;

Female  $M_{\text{age}} = 19.53 \pm 1.42$ ). The academic profile of the participants included first year ( $n = 117$ ), second year ( $n = 68$ ), and upper year ( $n = 58$ ) students enrolled in biology, kinesiology, commerce, and engineering programs. Previous involvement in athletic pursuits was indicated by 45% of female participants and 65% of male participants. Finally, in keeping with the previous Schulte-Hostedde et al. (2008) study, participants in the present investigation were delimited to those who self-categorized as Caucasian, heterosexual, and not opposed to premarital sexual intercourse. The present sample of 244 participants was drawn from an initial pool of 291 individuals who completed the questionnaire.

*Independent variable: Stimulus picture and description*

Participants were presented a picture of one of two possible individuals of the opposite sex who were determined to be either high or low in attractiveness. Attached to each picture was one of six possible descriptions of the individual presented. With respect to the process of obtaining female perceptions of males, a description is provided in the methodology communicated by Schulte-Hostedde et al. (2008), which was based on procedures and stimulus construction from previous research (e.g., Townsend and Levy, 1990). The exact process was replicated in the current follow-up study for stimuli presentation to females and it was also used as a template for devising stimuli for which males would respond. A description of the latter (i.e., stimuli for males) is presented herein.

In an effort to select appropriate pictures for high and low attractive females, a pilot study was conducted with 29 males who did not participate in the larger study but who were similar in characteristics to those outlined in the Participants' section of this report. The individuals in this pilot study were instructed to rate the attractiveness of nine females on a 7-point Likert-type scale (1 = "very unattractive"; "7 = very attractive"). All photos were black and white, non-smiling head shots that were of similar quality. The picture that yielded the highest mean score ( $M = 5.72$ ,  $SD = 0.88$ ) was used as the higher attractive photograph, whereas the picture that obtained the lowest mean score ( $M = 2.48$ ,  $SD = 0.98$ ) was used as the lower attractive photograph. The mean rating scores were found to be significantly different ( $t = 12.20$ ,  $p < .001$ ). In sum, there were practical and statistical differences in attractiveness ratings between the two females presented in the stimulus description for males.

Following from Schulte-Hostedde et al. (2008), the descriptions of the target person were manipulated to highlight type of sport involvement (i.e., 3 levels; team sport vs. individual sport vs. no sport involvement) and status of the target person (i.e., 2 levels; high vs. low status). As previously communicated (Schulte-Hostedde et al. 2008), it was assumed that the use of the term "extra-curricular club" would be interpreted by the participants as describing an individual who did not participate in sport. The description was as follows:

*This is Sarah. She is a member of a(n) [either (a) varsity team sport, (b) varsity individual sport, or (c) extra-curricular club]. She is ranked as one of the [either (a) less skilled members or (b) more skilled players] and is [either (a) not regarded highly or (b) regarded highly; to match (a) and (b) of the previous choice] by other members. She grew up in [location of study] and has a younger sister and older brother. She loves to eat out and watches television occasionally. She loves dogs.*

Taking into account the pictures (2 levels), and both sport involvement (3 levels) and status (2 levels) manipulations, male and female participants were given one of twelve possible independent stimulus conditions.

## **Measures**

*Demographic questions.* The information contained in the Participants' section reflects a summary of relevant responses to a series of demographic questions. These included open-ended and dichotomous response option questions pertaining to age, ethnicity, program of study, year of study, sexual orientation, ethnic preferences for potential mates, participation in sport (indicating type, level, and duration of sport involvement), past and present involvement in romantic relationships, duration of relationships, beliefs about premarital sexual relations, sexual activity, and information pertaining to menstrual cycle (females only).

*Individual characteristics.* Participants were asked to react to a series of statements pertaining to their perceptions of the target person's characteristics. The characteristics chosen followed from previous research that explored mating preferences in males and females. It has been well documented that both males and females seek out partners who have high social status and good financial prospects, in addition to being physically attractive, kind, intelligent, healthy, emotionally stable, ambitious, mature, dependable, and committed (Botwin, Buss, and Shackelford, 1997; Buss, 2004; Buss and Barnes, 1986). There were 19 statements in total to which participants responded on a 7-point Likert-type scale ranging from 1 ("*Strongly Disagree*") to 7 ("*Strongly Agree*"). Instructions indicated that participants were required to circle the degree to which they felt each statement represented the target person. Specifically, these statements included: (S)he (a) would be committed to a relationship, (b) has good financial prospects, (c) has a dependable character, (d) has a pleasing disposition, (e) is impulsive, (f) has high status among peers, (g) has good social skills, (h) is ambitious/industrious, (i) has a quick temper, (j) is intelligent, (k) is lazy, (l) is healthy, (m) is confident, (n) is insecure, (o) is competitive, (p) is selfish, (q) is emotionally stable, (r) is promiscuous, and (s) would want children. To control for order effects, questions were presented in 6 different arrangements and were randomly assigned to each of the 12 different mate questionnaire conditions. We culled these characteristics from established studies of human mate choice (Buss and Barnes 1986, Buss et al. 1990, Botwin et al. 1997).

## *Procedure*

Approval from the lead author's institutional research ethics board was obtained prior to initiating the study. Participants were recruited through their university classes. Instructors were initially approached to allow the fourth author to request participation from the students. Once permission was obtained, the researcher explained the purpose of the study, distributed letters of information and consent, and subsequently gave the questionnaire to those who agreed to participate and who had signed the letter of consent.

**Table 1.** Means (standard deviations) of males' and females' perceptions of individual characteristics based on sport involvement

Characteristic	Male Perceptions of Females			Female Perceptions of Males		
	Individual	Team	Extra Curr	Individual	Team	Extra Curr
Committed	4.77 (.99)	4.83 (1.00)	4.79 (1.22)	4.09 (1.04)	3.98 (1.41)	4.53 (1.15)
Financial prospects	4.36 (.90)	4.29 (.87)	4.28 (1.28)	4.16 (1.00)	4.17 (1.12)	4.08 (1.49)
Dependable <sup>m</sup>	4.72 (.97)	5.07 (1.06)	4.36 (1.16)	4.28 (1.05)	4.07 (.89)	4.33 (1.40)
Pleasing disposition <sup>m,f</sup>	4.31 (1.10)	4.83 (1.12)	4.28 (1.15)	4.30 (.99)	4.14 (1.03)	3.75 (1.24)
Impulsive	3.49 (1.19)	3.41 (1.14)	3.74 (1.04)	3.74 (1.16)	3.76 (1.01)	3.35 (1.15)
High status	4.54 (1.80)	4.24 (1.93)	3.87 (1.66)	4.19 (1.86)	4.19 (2.09)	3.85 (1.85)
Social skills <sup>m,f</sup>	4.54 (1.39)	4.85 (1.22)	4.18 (1.45)	4.44 (1.45)	4.60 (1.59)	4.03 (1.46)
Ambitious <sup>m</sup>	4.77 (1.39)	4.85 (1.22)	4.00 (1.56)	4.33 (1.30)	4.43 (1.23)	4.13 (1.68)
Quick temper	3.10 (1.17)	3.32 (1.49)	3.26 (1.04)	3.70 (1.10)	3.69 (1.12)	3.53 (1.11)
Intelligent	4.79 (.95)	4.73 (.95)	5.05 (1.17)	4.47 (.96)	4.14 (1.03)	4.68 (1.25)
Lazy <sup>m,f</sup>	2.77 (1.20)	2.66 (1.44)	3.87 (1.51)	3.12 (1.45)	3.17 (1.53)	3.93 (1.72)
Healthy <sup>m,f</sup>	5.41 (1.27)	5.88 (1.05)	4.21 (1.56)	5.21 (1.13)	5.10 (1.30)	3.68 (1.39)
Confident <sup>f</sup>	4.87 (1.63)	4.78 (1.52)	4.38 (1.46)	4.65 (1.29)	4.67 (1.49)	4.03 (1.56)
Insecure	3.13 (1.28)	3.34 (1.49)	3.36 (1.25)	3.47 (1.32)	3.52 (1.42)	3.83 (1.36)
Competitive <sup>m,f</sup>	4.97 (1.69)	5.32 (1.44)	3.31 (1.58)	4.98 (1.47)	5.14 (1.34)	3.55 (1.41)
Selfish	2.92 (1.04)	3.39 (1.16)	2.87 (.89)	3.81 (1.12)	3.64 (1.14)	3.38 (1.06)
Emotionally stable	4.59 (1.31)	4.49 (1.23)	4.23 (1.27)	4.33 (.99)	4.10 (.91)	4.08 (1.05)
Promiscuous <sup>f</sup>	3.38 (1.23)	3.63 (1.18)	3.44 (1.37)	3.88 (1.56)	4.14 (1.72)	3.18 (1.34)
Wants children	4.69 (1.42)	5.00 (1.32)	4.97 (1.25)	4.14 (1.15)	4.10 (1.36)	4.30 (1.14)

*Note.* Mean responses range from 1 (“*Strongly Disagree*”) to 7 (“*Strongly Agree*”).  
<sup>m</sup>Significant differences found with respect to males’ perceptions of females. <sup>f</sup>Significant differences found with respect to females’ perceptions of males.

The questionnaire contained the information described above in the “measures” and “independent variable” sections. Participants were randomly assigned to one of twelve independent conditions and asked to complete the questionnaire without interaction with their peers in the classroom. All data collection periods were monitored by the fourth author to ensure that participants were completing the questionnaires on an individual basis and to answer any questions that arose. Confidentiality and anonymity of all responses were guaranteed to participants and their involvement was completely voluntary (i.e., not a course requirement).

## **Results**

Two multivariate analyses of variance were performed on the 19 dependent variables (i.e., perceived characteristics). The independent variables included sport involvement (three levels: team sport involvement vs. individual sport involvement vs. non-sport condition), attractiveness (two levels: high vs. low), and status (two levels: high vs. low). The first MANOVA was conducted to analyze females’ perceptions of the male stimulus picture/description while the second MANOVA was conducted to analyze males’ perceptions of the female stimulus picture/description. Due to the number of variables in relation to sample size and in addition to conducting two separate analyses, a more conservative criterion value ( $p < .01$ ) was employed to evaluate multivariate results. Descriptive statistics (i.e., means and standard deviations) are found in Table 1.

### *Females’ Perceptions of Male Characteristics*

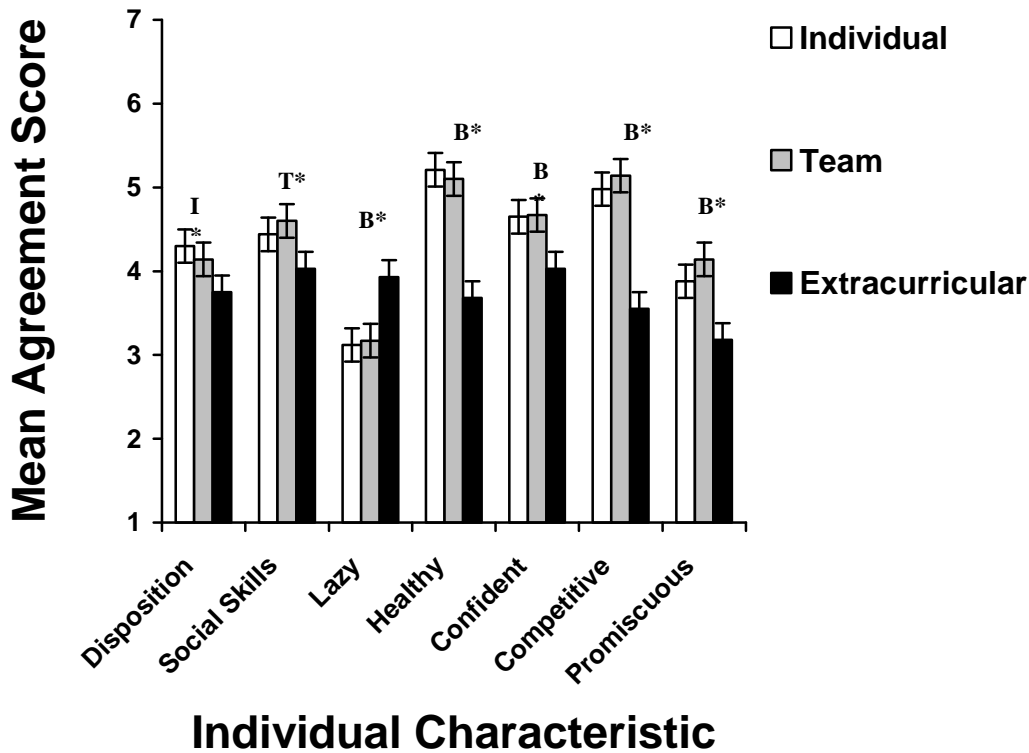
The multivariate analysis of variance demonstrated significant overall main effects for the manipulation of sport involvement, Wilks’  $\lambda = .43$ ,  $F(38,190) = 2.64$ ,  $p < .001$ ,  $\eta^2 = .35$ , attractiveness, Wilks’  $\lambda = .57$ ,  $F(19,95) = 3.78$ ,  $p < .001$ ,  $\eta^2 = .43$ , and status, Wilks’  $\lambda = .39$ ,  $F(19,95) = 7.71$ ,  $p < .001$ ,  $\eta^2 = .61$ . No interaction effects were found between any of the three independent variables.

As it pertains to our main independent variable of interest, these results indicated that there were general differences in the perceptions of individual characteristics of males based on their described *sport involvement*. Further univariate analyses indicated differences in responses to the three conditions with respect to perceptions of disposition,  $F(2,113) = 3.97$ ,  $p < .05$ ,  $\eta^2 = .07$ , social skills,  $F(2,113) = 4.31$ ,  $p < .05$ ,  $\eta^2 = .07$ , laziness,  $F(2,113) = 4.47$ ,  $p < .05$ ,  $\eta^2 = .07$ , health status,  $F(2,113) = 24.05$ ,  $p < .001$ ,  $\eta^2 = .30$ , confidence,  $F(2,113) = 5.89$ ,  $p < .01$ ,  $\eta^2 = .09$ , competitiveness,  $F(2,113) = 27.38$ ,  $p < .001$ ,  $\eta^2 = .33$ , and promiscuity,  $F(2,113) = 7.53$ ,  $p < .01$ ,  $\eta^2 = .12$ .

Given that three conditions were present, post-hoc analyses (Tukey HSD) were conducted to determine specific differences between team sport, individual sport, and non-sport conditions (see Figure 1 and Table 1). For disposition perceptions, the mean for the individual sport condition ( $M = 4.30$ ) was significantly higher than the non-sport condition ( $M = 3.75$ ,  $p < .05$ , Cohen’s  $d = .49$ ). In the case of social skills perceptions, the mean for the team sport condition ( $M = 4.60$ ) was significantly higher than the non-sport condition ( $M = 4.03$ ,  $p < .05$ , Cohen’s  $d = .37$ ). With regard to *laziness*, means for both the individual sport condition ( $M = 3.12$ , Cohen’s  $d = .51$ ) and the team sport condition ( $M = 3.17$ , Cohen’s  $d = .47$ ) were significantly lower (both  $p$  values = .05) than the non-sport

condition ( $M = 3.93$ ). Similarly, with respect to perceptions of health status, confidence, competitiveness, and promiscuity, males involved in both team sport ( $M = 5.10, 4.67, 5.14,$  and  $4.14$ ; Cohen's  $d = 1.06, .42, 1.16,$  and  $.62$  respectively) and individual sport ( $M = 5.21, 4.65, 4.98,$  and  $3.88$ ; Cohen's  $d = 1.21, .43, .99,$  and  $.48$  respectively) were rated higher in these characteristics than those in the non-sport condition ( $M = 3.68, 4.03, 3.55,$  and  $3.18$  respectively; all  $p$  values  $< .05$ ). With respect to Cohen's  $d$ , generally it is suggested that values of  $.20, .50,$  and  $.80$  represent small, medium, and large effect sizes. As such, the significant comparisons noted above range between lower medium to large effects ( $.37 \leq d \leq 1.21$ ).

**Figure 1.** Main effect of male sport involvement on females' perceptions of associated characteristics (only statistically significant results demonstrated; standard error of means represented). <sup>B</sup> indicates significant differences between both types of sport involvement and the non-sport condition. <sup>T</sup> indicates a significant difference between only team sport involvement and the non-sport condition. <sup>I</sup> indicates a significant difference between only individual sport involvement and the non-sport condition. \* $p < .05$ ; \*\* $p < .01$

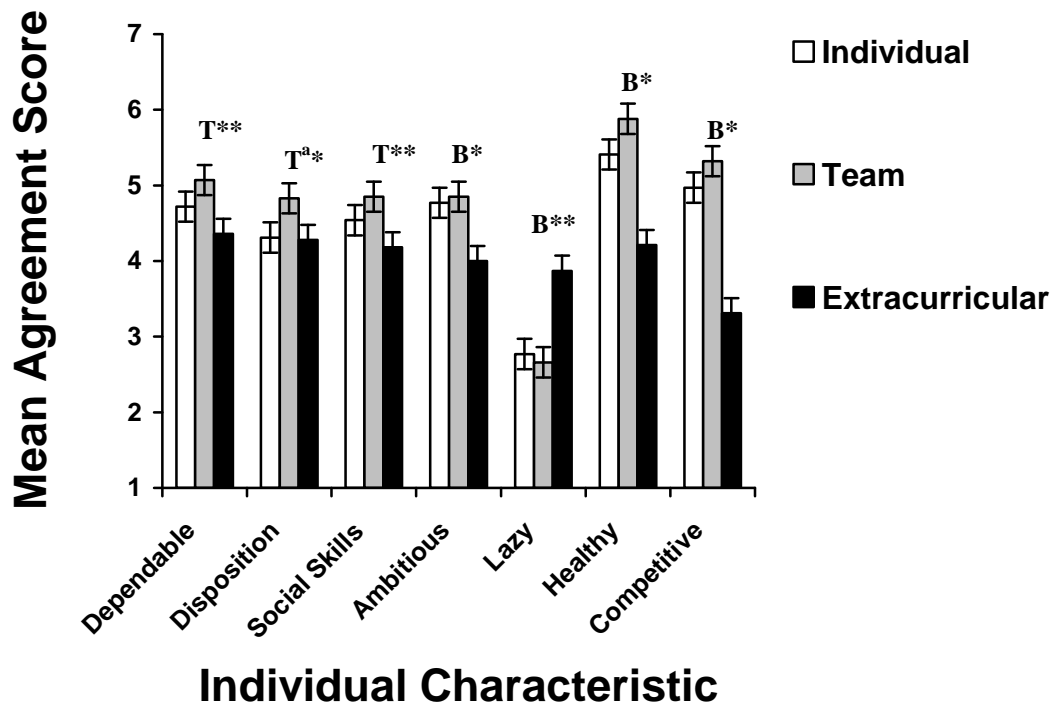


A secondary objective of this study was to examine the effect of sport involvement on perceptions of personal characteristics *relative* to other variables (i.e., attractiveness and status) previously shown to be influential. An examination of the main effect sizes presented above (i.e.,  $\eta^2$  values) suggests that male sport involvement explains a relatively similar amount of variance in females' perceptions of personal characteristics ( $\eta^2 = .35$ ) in comparison to attractiveness ( $\eta^2 = .43$ ) and is somewhat lower compared to status ( $\eta^2 = .61$ ). While no specific presentation of the univariate results for these latter two variables is



presented, an examination of Tables 2 and 3 highlights that the high attractiveness and high status conditions yielded more positive perceptions of personal characteristics.

**Figure 2.** Main effect of female sport involvement on males' perceptions of associated characteristics (only statistically significant results demonstrated; standard error of means represented). <sup>B</sup> indicates significant differences between both types of sport involvement and the non-sport condition. <sup>T</sup> indicates a significant difference between only team sport involvement and the non-sport condition. <sup>I</sup> indicates a significant difference between only individual sport involvement and the non-sport condition. <sup>a</sup>In the case of perceptions for the disposition characteristic, the team sport involvement condition was significantly different than both individual sport and non-sport conditions. \* $p < .05$ ; \*\* $p < .01$



*Males' Perceptions of Female Characteristics*

Overall, a very similar pattern of results was found with respect to males' perceptions of female characteristics. The multivariate analysis of variance demonstrated significant overall main effects for the manipulation of sport involvement, Wilks'  $\lambda = .39$ ,  $F(38,178) = 2.79$ ,  $p < .001$ ,  $\eta^2 = .37$ , attractiveness, Wilks'  $\lambda = .69$ ,  $F(19,89) = 2.15$ ,  $p < .01$ ,  $\eta^2 = .31$ , and status, Wilks'  $\lambda = .35$ ,  $F(19,89) = 8.65$ ,  $p < .001$ ,  $\eta^2 = .65$ . No interaction effects were found between any of the three independent variables.

Further univariate analyses pertaining to the effect of our main variable of interest (i.e., sport involvement) indicated differences in responses to the three conditions with respect to perceptions of dependability,  $F(2,107) = 6.57$ ,  $p < .01$ ,  $\eta^2 = .11$ , disposition,  $F(2,107) = 5.02$ ,  $p < .01$ ,  $\eta^2 = .09$ , social skills,  $F(2,107) = 6.49$ ,  $p < .01$ ,  $\eta^2 = .11$ , ambition,  $F(2,107) = 6.00$ ,  $p < .01$ ,  $\eta^2 = .10$ , laziness,  $F(2,107) = 10.25$ ,  $p < .001$ ,  $\eta^2 = .16$ ,

health status,  $F(2,107) = 20.74, p < .001, \eta^2 = .28$ , and competitiveness,  $F(2,107) = 24.39, p < .001, \eta^2 = .31$ .

Post-hoc analyses (Tukey HSD) to determine specific differences between team sport, individual sport, and non-sport conditions (see Figure 2 and Table 2) revealed that the means for the team sport condition ( $M = 5.07, 4.85$ ) were significantly higher than the non-sport condition ( $M = 4.36, 4.18$ ; both  $p$  values  $< .01$ ; Cohen's  $d = .64, .50$ ) for perceptions of dependability and social skills respectively. Further, for disposition perceptions, the mean for the team sport condition ( $M = 4.83$ ) was significantly higher than *both* the individual and non-sport conditions ( $M = 4.31, 4.28$ ; both  $p$  values  $< .05$ ; Cohen's  $d = .47, .48$ ). In the case of perceptions of ambition, health status, and competitiveness, the means for both team sport ( $M = 4.85, 5.88, 5.32$ ; Cohen's  $d = .61, 1.26, 1.33$ ) and individual sport conditions ( $M = 4.77, 5.41, 4.97$ ; Cohen's  $d = .52, .84, 1.01$ ) were significantly higher than the non-sport condition ( $M = 4.00, 4.21, 3.31$ ; all  $p$  values  $< .05$ ). Finally, with regard to *laziness*, means for both the individual sport condition ( $M = 2.77$ , Cohen's  $d = .81$ ) and the team sport condition ( $M = 2.66$ , Cohen's  $d = .82$ ) were significantly lower ( $p = .01$ ) than the non-sport condition ( $M = 3.87$ ). Finally, the significant comparisons noted above range between medium to large effects. ( $.47 \leq d \leq 1.33$ )

An examination of the effect of sport involvement on perceptions of personal characteristics *relative* to the other independent variables (i.e., attractiveness and status) suggests (similar to females' perceptions of male characteristics) that female sport involvement explains a relatively similar amount of variance in males' perceptions of personal characteristics ( $\eta^2 = .37$ ) in comparison to attractiveness ( $\eta^2 = .31$ ) but lower in comparison to status ( $\eta^2 = .65$ ). Again, no specific presentation of the univariate results for these latter two variables is presented, but an examination of Tables 2 and 3 highlights that the high attractiveness and high status conditions yield more positive perceptions of personal characteristics.

## **Discussion**

Overall, the perceptions that males and females hold for team sport athletes, individual sport athletes, and non-participants demonstrated consistencies as well as differences that are in agreement with theoretical predictions. First, both team and individual sport athletes were perceived as being less lazy, healthier, and more competitive than non-participants. This result occurred for male perceptions of females, and female perceptions of males. Intuitively, this result is expected. Varsity athletes are physically active, with a focus on individual fitness and a commitment to practicing their sport that would generally be perceived as an engaged, healthy, and active lifestyle. Further, varsity athletes compete at a relatively high level on behalf of their institution and thus should be competitive in orientation. Interestingly, perceptions of the health of athletes do not reflect the apparent complexity of the health behaviors of this population. For example, despite developing a healthy physical activity profile, varsity athletes tend to demonstrate (a) higher risk-taking behaviors associated with alcohol consumption and smokeless tobacco use (in males), (b) a greater number of sexually transmitted diseases and lower contraceptive use, and (c) a higher prevalence of eating disorders and lower body image perceptions (Nattiv, Puffer, and Green, 1997; Pritchard, Milligan, Elgin, Rish and Shea, 2007).

**Table 2.** Means (standard deviations) of males' and females' perceptions of individual characteristics based on attractiveness (high vs. low)

Characteristic	Male Perceptions of Females		Female Perceptions of Males	
	High	Low	High	Low
Committed	4.78 (1.08)	4.81 (1.05)	4.00 (1.27)	4.37 (1.16)
Financial prospects	4.38 (1.04)	4.22 (1.00)	4.18 (1.25)	4.09 (1.18)
Dependable	4.86 (1.00)	4.56 (1.19)	4.31 (1.06)	4.14 (1.19)
Pleasing disposition <sup>m,f</sup>	4.78 (1.01)	4.11 (1.19)	4.36 (.97)	3.80 (1.16)
Impulsive	3.57 (1.22)	3.52 (1.01)	3.75 (.96)	3.50 (1.23)
High status	4.48 (1.65)	3.91 (1.96)	4.25 (1.89)	3.92 (1.95)
Social skills <sup>m,f</sup>	4.82 (1.35)	4.19 (1.33)	4.70 (1.42)	4.03 (1.53)
Ambitious <sup>f</sup>	4.63 (1.22)	4.44 (1.66)	4.56 (1.30)	4.05 (1.47)
Quick temper	3.28 (1.26)	3.17 (1.24)	3.77 (.84)	3.52 (1.30)
Intelligent	4.86 (.98)	4.85 (1.09)	4.41 (1.17)	4.44 (1.02)
Lazy	3.14 (1.49)	3.04 (1.49)	3.15 (1.63)	3.63 (1.54)
Healthy <sup>f</sup>	5.25 (1.38)	5.09 (1.59)	4.98 (1.36)	4.39 (1.47)
Confident <sup>m,f</sup>	4.98 (1.38)	4.31 (1.66)	4.89 (1.33)	4.05 (1.49)
Insecure	3.22 (1.35)	3.35 (1.33)	3.51 (1.29)	3.69 (1.44)
Competitive <sup>f</sup>	4.40 (1.89)	4.72 (1.65)	4.80 (1.55)	4.36 (1.56)
Selfish	3.12 (1.13)	3.00 (.97)	3.75 (1.04)	3.48 (1.17)
Emotionally stable <sup>f</sup>	4.65 (1.26)	4.19 (1.25)	4.38 (.88)	3.97 (1.04)
Promiscuous <sup>m,f</sup>	3.71 (1.26)	3.22 (1.21)	4.39 (1.35)	3.12 (1.57)
Wants children <sup>f</sup>	4.82 (1.33)	4.98 (1.33)	3.93 (1.15)	4.41 (1.23)

*Note.* Mean responses range from 1 (“Strongly Disagree”) to 7 (“Strongly Agree”).  
<sup>m</sup>Significant differences found with respect to males’ perceptions of females. <sup>f</sup>Significant differences found with respect to females’ perceptions of males.

**Table 3.** Means (standard deviations) of males' and females' perceptions of individual characteristics based on status (high vs. low)

Characteristic	Male Perceptions of Females		Female Perceptions of Males	
	High	Low	High	Low
Committed	4.82 (1.16)	4.78 (.98)	4.07 (1.32)	4.30 (1.12)
Financial <sup>m,f</sup> prospects	4.66 (1.05)	4.00 (.90)	4.68 (1.01)	3.65 (1.17)
Dependable <sup>m,f</sup>	5.09 (1.07)	4.40 (1.03)	4.64 (.98)	3.85 (1.13)
Pleasing disposition <sup>m,f</sup>	4.79 (1.12)	4.21 (1.10)	4.44 (.99)	3.74 (1.10)
Impulsive <sup>m</sup>	3.82 (1.19)	3.30 (1.01)	3.73 (1.22)	3.53 (1.01)
High status <sup>m,f</sup>	5.61 (1.29)	2.98 (1.21)	5.49 (1.29)	2.82 (1.47)
Social skills <sup>m,f</sup>	5.45 (1.06)	3.71 (1.07)	5.19 (1.28)	3.62 (1.31)
Ambitious <sup>m,f</sup>	5.18 (1.34)	3.98 (1.28)	4.90 (1.24)	3.76 (1.34)
Quick temper	3.34 (1.34)	3.13 (1.16)	3.81 (1.04)	3.48 (1.14)
Intelligent <sup>m,f</sup>	5.09 (1.10)	4.65 (.92)	4.66 (.98)	4.21 (1.16)
Lazy <sup>m,f</sup>	2.84 (1.59)	3.32 (1.35)	3.03 (1.53)	3.71 (1.60)
Healthy <sup>m,f</sup>	5.66 (1.44)	4.75 (1.38)	5.10 (1.34)	4.30 (1.44)
Confident <sup>m,f</sup>	5.48 (1.39)	3.97 (1.31)	5.15 (1.30)	3.83 (1.33)
Insecure <sup>m,f</sup>	2.91 (1.35)	3.60 (1.25)	3.31 (1.33)	3.86 (1.35)
Competitive <sup>m,f</sup>	5.27 (1.67)	3.90 (1.65)	5.36 (1.24)	3.88 (1.49)
Selfish <sup>f</sup>	3.05 (1.03)	3.08 (1.08)	3.83 (1.02)	3.42 (1.16)
Emotionally stable <sup>f</sup>	4.61 (1.36)	4.29 (1.17)	4.51 (.90)	3.86 (.96)
Promiscuous <sup>f</sup>	3.68 (1.35)	3.32 (1.15)	4.19 (1.44)	3.35 (1.62)
Wants children <sup>f</sup>	4.91 (1.41)	4.87 (1.26)	4.46 (1.22)	3.92 (1.15)

*Note.* Mean responses range from 1 (“*Strongly Disagree*”) to 7 (“*Strongly Agree*”).  
<sup>m</sup>Significant differences found with respect to males’ perceptions of females. <sup>f</sup>Significant differences found with respect to females’ perceptions of males.

The present study also found that male athletes were perceived to be more promiscuous than non-participants. This perception of promiscuity of male athletes appears to be grounded in reality. Athletes, especially males, appear to have more sexual partners than non-participants (Faurie et al., 2004; Nattiv et al., 1997), and high-level athletes (both male and female) reported more sexual partners than low level athletes (Faurie et al., 2004). Why do athletes, especially male athletes, have more sexual partners than non-participants, and why are they thus perceived as more promiscuous? There are several issues that may influence this point. First, male athletes tend to have athletic physiques that are considered attractive by females (Dixon et al. 2003; Jonason, 2007; Li and Kenrick, 2006). However, this alone may not explain the attractiveness of athletes because it is unclear whether individuals who engage in fitness related activities (e.g., individuals who workout in a fitness facility) but do not compete in sport are as desirable to females as athletes. Alternatively, or perhaps concurrently, athletes (especially team sport athletes) may be more desirable (Schulte-Hostedde et al., 2008) and perceived as more promiscuous than non-athletes because of their enhanced status. Specifically, the social status afforded to athletes may render them attractive, leading to more sexual partners. Participation in sports is associated with enhanced status in young men (Miller, Sabo, Farrell, Barnes, and Melnick, 1998), and females prefer mates that are of high status for both long and short-term relationships (Hopcroft, 2006; Li and Kenrick, 2006).

Underlying the perception that athletes are more promiscuous than non-athletes is the physiological reality that androgens such as testosterone influence the development of the attractive physiques of athletes (Bhasin et al. 1996), as well as dominant and hypersexual behaviour (Davidson et al. 1982, Mazur and Booth 1998). Thus, testosterone is expected to play a key role in human mate choice (e.g. van Anders et al. 2007).

The initial goal of the present study was to test the prediction that potential mates identified as team sport athletes will elicit more favorable ratings of positive characteristics than individual sport athletes or non-participants. This prediction was generated from the discussion of our previous study's results (Schulte-Hostedde et al., 2008) in which we proposed that team athletes might be perceived as better mates due to associated perceptions related to greater cooperativeness, dependability, and (to a lesser degree) financial prospects. These results were upheld with respect to male perceptions of female team sport athletes. Males perceived female team sport athletes as more dependable, having better social skills, and, weakly, being of a more positive disposition.

What is most surprising, however, is that females did not share the same perceptions as males. Indeed, the initial hypothesis that male team athletes might be viewed as having more positive attributes such as willingness to cooperate, acceptance of responsibility, etc. (i.e., traits associated with good parenting and willingness to engage in long-term commitments; Schulte-Hostedde et al., 2008) appears to not be supported given the absence of the perception of these types of positive attributes. Females viewed male athletes, in general, as healthy, confident, and competitive relative to non-athletes, but other than male team athletes being perceived as having greater social skills, there was no evidence that females perceive male team sport athletes as better long-term mates. If females perceived team sport athletes in particular as more likely to accept relation-based roles and better able to communicate than non-athletes (as proposed in Schulte-Hostedde et al. 2008), we would have expected that this would be reflected in the results of this study by having female subjects assign individual characteristics related to those personality traits

to the target male. An alternative hypothesis explaining why male athletes, and especially team sport athletes, might be more desirable mates is that sport provides a venue with which males can display physical dominance and prowess. Team sport athletes must not only compete against members of another team, but also against members of the same team to gain a relative ranking (e.g. starters vs. benchwarmers). Given the results of this study, this hypothesis may be particularly relevant and merits further investigation

There were no differences detected in terms of the perception of financial prospects among team and individual sport athletes, and non-athletes; a second suggestion proposed in our previous study. There are two reasons why we expected that athletes (particularly team sport athletes) would be perceived as having better financial prospects. First, varsity athletes, especially those competing in sports for which there are professional opportunities, may have a higher probability of achieving professional status and earning a much higher salary than the average (Rosner and Shropshire, 2004). Given the context of our current study, however, this explanation would appear to be unlikely because the probability of an individual from a small Canadian university becoming a professional athlete is small relative to counterparts from larger institutions or from other countries (e.g., the United States). Nonetheless, this type of argument may have merit in colleges and universities in the United States where varsity athletes participate in the National Collegiate Athletics Association (i.e., NCAA) and professional prospects are arguably greater. A second reason for our hypothesis was that there is some evidence that former varsity athletes earn more income than non-athletes in the labor market (Henderson, Olbrecht, and Polachek, 2006; Long and Caudill, 1991). While the saliency of this prior evidence to study participants can be debated (i.e., it is likely that average university students are not aware of the general financial prospects of varsity athletes vs. non-athletes), it appears that there is no effect of sport involvement on perceptions of earning ability by potential mates.

An important confounding factor in our study may be the underlying cultural bias toward specific sports that exists in North America. For example, in Canada, hockey is highly popular, and in the United States basketball, American football, and baseball are very popular sports. Given that the subjects of our study may have a biased view of sport and athletic competition, it would be of interest to examine the issues of mate choice and perceptions of potential mates in a different context. For example, competitive swimming has a very high profile in Australia (Swimming Australia, 2009), and in the Scandinavian countries competitive cross-country skiing (Dølvik, 1990) is also very popular. Perceptions of individuals (whether male or female) may be affected by these underlying biases, thus our results may be dependent on the cultural framework of the population of subjects. It would be interesting to examine issues of sport and mate choice in other jurisdictions where the profile of both team and individual sports differs from the North American context.

One of the most novel results of this study is the finding that the manipulation of sports participation produced effect sizes similar to the effect sizes produced by the manipulation of physical attraction (although less than those of status) in both the male and female conditions. This indicates that sports involvement has the potential to cause changes in the perceptions of individuals on par with changes in perception due to their physical appearance and highlights the role that sports involvement plays in influencing human mate preferences. While there was only a limited difference between the team and individual sports manipulation, the differences of the characteristics perceived between the sport participants in comparison to the non-participants were quite pronounced. Future studies

could further follow up on this study by attempting to determine why sports involvement produces these changes in perception and how large a role these changes play in affecting mate choice in humans and between the two genders.

**Acknowledgements:** Each investigator contributed significantly to the research for this article and considers its authorship as joint. The authors thank the participants of this study and their faculty instructors. AIS-H and MAE particularly thank C. Meagher for inspiring this line of inquiry.

**Received 24 June 2011; Revision submitted 11 November 2011; Accepted 25 January 2011**

## **References**

- Andersson, M. (1994) *Sexual selection*. Princeton, NJ: Princeton University Press.
- Bereczkei, T., Voros, S., Gal, A., and Bernath, L. (1997). Resources, attractiveness family commitment; Reproductive decisions in human mate choice. *Ethology*, 103, 681-699.
- Bhasin, S., Storer, T.W., Berman, N., Callegari, C., Clevenger, B., Phillips, J., Bunnell, T. J., Tricker, R., Shirazi, A., and Casaburi, R. (1996). The effects of supraphysiologic doses of testosterone on muscle size and strength in normal men. *New England Journal of Medicine*, 335, 1-7.
- Botwin, D.M., Buss, M.D., and Shackelford, K.T. (1997). Personality and mate preference: Five factors in mate selection and marital satisfaction. *Journal of Personality*, 65, 107-136.
- Buss, D.M. (2004). *Evolutionary psychology: The new science of the mind*. Pearson Publishing: New York.
- Buss, D.M. (2006). Strategies of human mating. *Psychological Topics*, 15, 239-260.
- Buss, D.M., and Barnes, M. (1986). Preferences in human mate selection. *Journal of Personality and Social Psychology*, 50, 559-570.
- Buss, D.M., Abbott, M., Angleitner, A., Asherian, A., Biaggio, A., Blanco-Villasenor, A., et al. (1990). International preferences in selecting mates: A study of 37 cultures. *Journal of Cross-Cultural Psychology*, 21, 5-47.
- Clutton-Brock, T., and McAuliffe, K. (2009). Female mate choice in mammals. *Quarterly Review of Biology*, 84, 3-27.
- Davidson, J.M., Kwan, M., and Greenleaf, W.J. (1982). Hormonal replacement and sexuality in men. *Journal of Clinical Endocrinology and Metabolism*, 11, 599-623.
- Dion, K., Berscheid, E., and Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology*, 24, 285-290.
- Dixon, A., Halliwell, G., East, R., Wignarajah, P., and Anderson, M. (2003). Masculine somatotype and hirsuteness as determinants of sexual attractiveness to women. *Archives of Sexual Behavior*, 32, 29-39.
- Dølvik J.E. (1990). *Sports, recreation and organisation*. FAFO Report No. 99. Oslo: Institute for Applied Social Sciences.
- Faurie, C., Pontier, D., and Raymond, M. (2004). Student athletes claim to have more sexual partners than other students. *Evolution and Human Behavior*, 25, 1-8.

- Fink, B., and Penton-Voak, I. (2002). Evolutionary psychology of facial attractiveness. *Current Directions in Psychological Science*, *11*, 154-158.
- Fredrick, A.D., and Haselton, G.M. (2007). Why is muscularity sexy? Tests of the fitness indicator hypothesis. *Personality and Social Psychology Bulletin*, *44*, 1167-1183.
- Furnham, A., Petrides, K. V., and Constantinides, A. (2005). The effects of body mass index and waist-to-hip ratio on ratings of female attractiveness, fecundity, and health. *Personality and Individual Differences*, *38*, 1823-1834.
- Gross, E.G., and Crofton, C. (1977). What is good is beautiful. *Sociometry*, *40*, 85-90.
- Henderson, D.J., Olbrecht, A., and Polachek, A. (2006). Do former college athletes earn more at work? A non parametric assessment. *Journal of Human Resources*, *XLI*, 558-577.
- Hopcroft, R.L. (2006) Sex, status, and reproductive success in the contemporary United States. *Evolution and Human Behavior*, *27*, 104-120.
- Jonason, P.K. (2007). An evolutionary psychology perspective on sex differences in exercise behaviors and motivations. *Journal of Social Psychology*, *147*, 5-14.
- Li, N.P., and Kenrick, D.T. (2006). Sex similarities and differences in preferences for short-term mates: What, whether, and why. *Journal of Personality and Social Psychology*, *90*, 468-489.
- Li, N.P., Kenrick, D., Bailey, J., and Linsenmeier, J. (2002). The necessities and luxuries of mate preferences: Testing the tradeoffs. *Journal of Personality and Social Psychology*, *82*, 947-955.
- Long, J.E., and Caudill, S.B. (1991). The impact of participation in intercollegiate athletics on income and graduation. *Review of Economics and Statistics*, *73*, 525-531.
- Malina, R.M., Bouchard, C., and Bar-Or, O. (2004). *Growth, maturation, and physical activity*. Human Kinetics: Champaign, IL.
- Mazur, A., and Booth, A. (1998). Testosterone and dominance in men. *Behavioral and Brain Sciences*, *21*, 353-397.
- Miller, K.E., Sabo, D.F., Farrell, M.P., Barnes, G.M., and Melnick, M.J. (1998). Athletic participation and sexual behavior in adolescents: The different worlds of boys and girls. *Journal of Health and Social Behavior*, *39*, 108-123
- Nattiv, A., Puffer, J.C., and Green, G.A. (1997). Lifestyles and health risks of collegiate athletes: a multi-center study. *Clinical Journal of Sport Medicine*, *7*, 262-272.
- Pritchard, M.E., Milligan, B., Elgin, J., Rush, P., and Shea, M. (2007). Comparisons of risky health behaviors between male and female college athletes and non-athletes. *Athletic Insight*, *9*, 67-78.
- Rhodes, G., Chan, J., Zebrowitz, L.A., and Simmons, L.W. (2003). Does sexual dimorphism in human faces signal health? *Proceedings of the Royal Society of London B*, *270*, S93-S95.
- Rhodes, G., Simmons, L.W., and Peters, M. (2005). Attractiveness and sexual behaviour: Does attractiveness enhance mating success? *Evolution and Human Behavior*, *26*, 186-201.
- Rosner, S., and Shropshire, K.L. (2004). *The business of sports*. Jones and Bartlett Publishers: Sudbury, MA.
- Schulte-Hostedde, A.I., Eys, M.A., and Johnson, K. (2008) Female mate choice is influenced by male sport participation. *Evolutionary Psychology*, *6*, 113-124.



- Singh, D. (1995). Female judgment of male attractiveness and desirability for relationships: Role of waist-to-hip ratio and financial status. *Journal of Personality and Social Psychology*, *69*, 1089-1101.
- Singh, D., and Singh D. (2006). Role of body fat and body shape on judgement of female health and attractiveness: An evolutionary perspective. *Psychological Topics*, *15*, 331-350.
- Swimming Australia (2009). Annual Report 2008-9. Accessed at [https://console.clubsonline.com.au/customitem/attachments/Swimming%20Aust%20A\\_R%202008\\_09\\_FINAL.pdf](https://console.clubsonline.com.au/customitem/attachments/Swimming%20Aust%20A_R%202008_09_FINAL.pdf) on Nov. 9, 2009.
- Townsend, M.J., and Levy, D.G. (1990). Effects of potential partners' physical attractiveness and socioeconomic status on sexuality and partner selection. *Archives of Sexual Behavior*, *19*, 149-164.
- Trivers, R.L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man, 1871-1971* (pp. 136-179). Chicago, IL: Aldine.
- Van Anders, S.M., Hamilton, L.D., and Watson, N.V. (2007). Multiple partners are associated with higher testosterone in North American men and women. *Hormones and Behavior*, *51*, 454-459.