Evolutionary Psychology
2015: 1–14

DOI: 10.1177/1474704915604563
evp.sagepub.com
SAGE

Height and Body Mass on the Mating Market: Associations With Number of Sex Partners and Extra-Pair Sex Among Heterosexual Men and Women Aged 18–65

David A. Frederick[1] and Brooke N. Jenkins[1]

Abstract

People with traits that are attractive on the mating market are better able to pursue their preferred mating strategy. Men who are relatively tall may be preferred by women because taller height is a cue to dominance, social status, access to resources, and heritable fitness, leading them to have more mating opportunities and sex partners. We examined height, education, age, ethnicity, and body mass index (BMI) as predictors of sexual history among heterosexual men and women ($N = 60{,}058$). The linear and curvilinear associations between self-reported height and sex partner number were small for men when controlling for education, BMI, and ethnicity (linear $\beta = .05$; curvilinear $\beta = -.03$). The mean and median number of sex partners for men of different heights were: very short (9.4; 5), short (11.0; 7), average (11.7; 7), tall (12.0; 7), very tall (12.1; 7), and extremely tall (12.3; 7). Men who were "overweight" reported a higher mean and median number of sex partners than men with other body masses. The results for men suggested limited variation in reported sex partner number across most of the height continuum, but that very short men report fewer partners than other men.

Keywords

sex partner number, mate preferences, attraction, height, body mass, evolution, mating market.

Date received: May 14, 2015; Accepted: August 10, 2015

Introduction

The primary goal of this study was to examine whether height is linked to sexual history for men in ways that are predictable based on mating market and evolutionary perspectives. In addition, we also examined how current body mass and how female height, along with other traits, are linked to sexual history in a sample of 60,058 heterosexual participants.

Possessing Attractive Traits on the Mating Market: Potential Links With Sexual Behavior

The metaphor of the "mating market" can illuminate patterns of mate preferences and behaviors (Pawlowski & Dunbar, 1999). Mate choice is a two-way process. Who a person enters into a relationship with depends on (a) what traits *that person* prefers and (b) what traits *potential partners* prefer. If a person possesses preferred traits, then that person has a strong bargaining hand when seeking a mate. If that person possesses nonpreferred traits, then that person has a weak bargaining hand. *People with more attractive traits are in a better position to pursue their preferred mating strategy on the mating market.* This mating market perspective can explain how the mate preferences of one sex dictate the bargaining hands and mating strategies of members of the other sex.

Both men and women pursue short-term and long-term mating strategies, but men are more open than women to sexual encounters across a wide variety of contexts (Buss & Schmitt, 1993; Schmitt et al., 2012). This gender difference may emerge, in part, due to the fact that men have higher reproductive potential and lower obligatory biological costs associated

[1] Crean School of Health Sciences, Chapman University, Orange, CA, USA

Corresponding Author:
David A. Frederick, Crean School of Health Sciences, Chapman University, Orange, CA, USA.
Email: enderflies1@aol.com

with reproduction (Trivers, 1972). The preferred mating strategy, therefore, may vary systematically by gender.

For many men, pursuing short-term strategies or a combination of short-term and long-term strategies may be the preferred mating strategy. Not all men, however, can successfully pursue short-term strategies. Strategic pluralism theory suggests that men who are in good condition and possess attractive traits are better able to pursue short-term mating opportunities and will, therefore, have more sex partners (Gangestad & Simpson, 2000). For example, men who are more muscular than average are rated more attractive and report more sex partners, brief sexual affairs, and affairs with mated women (Frederick & Haselton, 2007).

Using evolutionary mating market perspectives, it is difficult to make a priori predictions regarding the links between attractiveness and sexual behavior for women. Very attractive women are in the best position to be particularly choosy and to secure an attractive long-term partner who possesses resources, kindness, and willingness to invest in her and her offspring, leading to attractive women having fewer sexual partners. On the other hand, if attractive women receive the most solicitations for mating, this could lead to attractive women having more partners. Past research has found that self-rated attractiveness is weakly correlated with sexual experience for women, but ratings of women's attractiveness by independent judges do not generally correlate with sexual history (for a brief review, see Weeden & Sabini, 2007).

What traits are attractive to men and women that might impact their desirability on the mating market and thus may ultimately impact their sexual experiences and dating opportunities? Here we focus on height and body mass and provide explanations for why people may attend to these aspects of the body when selecting mates.

Theoretical Perspectives on Preferences for Relatively Tall Men

Women may prefer relatively tall men because tall height is a cue to indirect (genetic) benefits or because of the direct benefits that taller men may provide. Alternatively, or in addition, taller men may be more effective in intrasexual competition, which can result in more mating opportunities (for a review, see Stulp & Barrett, 2014). Finally, there are also likely sociocultural factors that increase women's preferences for relatively taller men.

Mate choice for indirect benefits. Indirect benefits are conferred to offspring of females through genetic inheritance. Some traits can only be produced by men with certain heritable qualities, resistance to disease, and low genetic mutation loads (Kaplan & Gangestad, 2005; Kokko, Brooks, Jennions, & Morley, 2003; Sear, 2010). Men who are tall may have a reproductive advantage if tall stature is a cue that the male was in good condition or if developing taller stature would enhance the attractiveness or reproductive success of offspring. Height itself is highly heritable, with estimates placing heritability around 0.80 (Macgregor, Cornes, Martin, & Visscher, 2006; McEvoy & Visscher, 2009; Silventoinen, Kaprio, Lahelma, Viken, & Rose, 2001; Silventoinen, Krueger, Bouchard, Kaprio, & McGue, 2004). Women who chose taller men as mates could directly pass this propensity for taller height to offspring, and, therefore, women prefer taller men as mates.

Mate selection for direct benefits. In contrast to indirect benefits, selection for direct benefits refers to the idea that females choose a mate because he possesses a trait that directly increases her health, survival, or lifetime reproductive output. This can include selection of males who provide superior resources, offer more parental care, or otherwise reduce female reproductive costs (Kokko et al., 2003). Height may be a particularly useful cue of access to resources and socioeconomic status (Cassidy, 1991; Judge & Cable, 2004; Murasko, 2013; Ranasinghe et al., 2011). Women who preferred tall men as mates could have experienced greater reproductive success because of the direct benefits that taller men may have been able to provide. These benefits could include resources and protection in either a short-term or a long-term mating context, and, thus, women may prefer taller men as mates (or may happen to choose taller men as mates when they exercise their preferences for access to resources or socioeconomic status).

Intrasexual competition. Although much research in evolutionary psychology has focused on the importance of female choice (e.g., Frederick, Reynolds, & Fisher, 2013; Gallup & Frederick, 2010; Miller, 2000), intrasexual competition also plays an important role in human mating (Puts, 2010). Taller men may be better able to intimidate rivals and thus gain control of resources or access to mates. Taller men are viewed as more dominant, more masculine, and better fighters. They are also more likely to be stronger, able to strike with greater force, hold positions of authority in the workplace, be less sensitive to cues of dominance in other men, be perceived as leaders, and exhibit greater aggression and interpersonal dominance (for reviews, see Blaker et al., 2013; Carrier, 2011; Stulp, Buunk, Verhulst, & Pollet, 2013, 2015).

Social norms. One explanation for women's preferences for taller men is that cultural transmission of certain ideals and behaviors is internalized by men and women, in particular, cultures. Men are expected to display masculine traits, and tallness may be perceived as a social cue of masculinity. If a man is shorter than his partner, this may cause people to view the man as less masculine and the woman as less feminine and lead to social stigma. Past research has only found weak correlations, however, between women's preferences for taller men and endorsement of male gender roles and norms (Salska et al., 2008; Swami et al., 2008).

Preferences for Male Height

Consistent with multiple evolutionary perspectives, height is considered an important feature of male attractiveness (for a review, see Courtiol, Raymond, Godelle, & Ferdy, 2010). In

two studies, women were more likely than men to indicate that height matters when selecting a mate (Salska et al., 2008; Yancey & Emerson, 2014), and taller men were more likely to be selected for dates at speed dating events (Kurzban & Weeden, 2005). In a study of personal advertisements, relatively short men were less likely to be contacted than other men. Tall men, however, did not appear to have an advantage over medium height men (Pawlowski & Koziel, 2002). Past research has found that taller men were more likely than shorter men to find a long-term partner and to have multiple long-term partners (Nettle, 2002a). Men who are shorter than average appear to be at a disadvantage on the mating market: Their partners are more likely to be less healthy, have lower incomes and education, and have higher body mass index (BMI; Stulp, Mills, Pollet, & Barrett, 2014).

Preferences for taller men, however, are not universal across all women within a culture or across cultures. One study found that among the Himba of northern Namibia, 52% of women preferred a taller partner, 34% of women preferred a partner of the same height, and 14% preferred a shorter partner (Sorokowski, Sorokowska, Fink, & Mberira, 2012). Among the Datoga people of Tanzania, only half (52%) of women preferred a taller partner (Sorokowski & Butovskaya, 2012).

One key to many women's preferences is that they tend to prefer relatively taller men, not necessarily very tall men (Courtiol et al., 2010; Pawlowski, 2003; Salska et al., 2008; Stulp, Buunk, & Pollet, 2013). The association between height and reproductive success across different cultures is frequently curvilinear, with the very shortest men having the fewest children and men in the center of the distribution having the most (for a review, see Stulp, Pollet, Verhulst, & Buunk, 2012). Extremely tall men are more likely to be excluded from the dating pools of shorter women and may have fewer dating options compared with men who are slightly taller than average.

Preferences for Male Body Mass

Cross-cultural research on preferences for male body mass is limited. In a U.S. sample, very slender and very fat men were preferred less than other men (Frederick & Haselton, 2007). In a study of 41 sites across 26 countries, however, preferences for body fat in men were highly variable (Frederick, Swami, & The 56 Members of the International Body Project, 2010). In Western contexts, there is a strong curvilinear association between BMI (weight/height^2) and body satisfaction. Men in the "normal/healthy" and "overweight" categories typically feel most satisfied with their bodies and evaluate their appearance more positively, presumably because they are perceived to have a healthy or athletic body-build (Frederick, Forbes, Grigorian, & Jarcho, 2007; Frederick, Peplau, & Lever, 2006; Peplau et al., 2009). It should be noted that the category overweight is a medical classification and does not necessarily conform to perceptions of who is overweight in a social context (e.g., George W. Bush fell in the middle of the overweight range during his presidency; Kolata, 2004).

Preferences for muscularity are clearer. Men with toned and muscular bodies are featured as prestigious and attractive in popular U.S. media (Frederick, Fessler, & Haselton, 2005), are rated more attractive than other men (Dixson, Dixson, Bishop, & Parish, 2010; Frederick & Haselton, 2007; Gray & Frederick, 2012), and report more sex partners (Frederick & Haselton, 2007; Lassek & Gaulin, 2009). Most men desire increased muscularity to attract women and to be more successful in intrasexual competition (Frederick, Buchanan, et al., 2007). Men with very high or low muscularity, however, are rated as less attractive than men with moderate muscularity (Frederick & Haselton, 2007).

Both muscularity and body fat contribute to the overall body mass. In the general population, BMI is strongly correlated with body fat percentage. For example, BMI is strongly correlated with abdominal visceral adipose tissue (range: $r = .61$–$.69$), abdominal subcutaneous adipose tissue (range: $r = .86$–$.93$), and fat mass (range: $r = .91$–$.94$; Camhi et al., 2011). The associations of both body fat and muscularity with attractiveness are curvilinear (Frederick, Buchanan, et al., 2007; Frederick & Haselton, 2007), and, therefore, we expected a curvilinear association between BMI and number of sex partners.

Preferences for Female Height

Using the logic of different evolutionary perspectives, it is less clear what height men would prefer in women. On the one hand, whereas it may be advantageous for males to allocate significant resources to developing tall body size in order to compete with rivals and to signal their fitness or social status to potential mates, female reproductive success may be enhanced by allocating available energy toward other processes such as enhancing fertility, pregnancy, lactation, and somatic upkeep (see Hrdy, 1981; Nettle, 2002b; Stearns, 1992; Stulp, Verhulst, Pollet, & Buunk, 2012). Shorter women also have a larger potential dating pool because women typically prefer men who are taller than themselves and men typically prefer women who are their height or shorter (Salska et al., 2008). Based on this logic, one might expect that shorter women would have more mating opportunities.

On the other hand, tall female height may be valued to the extent that height in women is a cue of access to resources, healthy development, dominance, and high status. Taller female height may be valuable because taller females may have relatively taller sons who might increase both their and their mate's reproductive success. It is clear that in some contexts, tall women are viewed as attractive. Prestigious mass media models, playgirl models, and beauty pageant winners tend to be taller than the average woman (Spitzer, Henderson, & Zivian, 1999). Taller women may be perceived to be more dominant than shorter women (Boyson, Pryor, & Butler, 1999), have higher social esteem and higher incomes (Judge & Cable, 2004), and be more satisfied with their height (Lever, Frederick, Laird, & Sadeghi-Azar, 2007). In one speed dating study, although women preferred men who were 25 cm taller on

average, men preferred women who were only 7 cm shorter on average (Stulp, Buunk, Kurzban, & Verhulst, 2013). Based on these findings, one might expect that taller women might have more mating opportunities, but it is difficult to make any a priori predictions regarding the links between height and sexual history for women.

Preferences for Female Body Mass

The existing research on body mass provides a clearer picture regarding which female body types are considered most attractive. Preferences for body fat level in women vary substantially across cultures, with relative thinness being considered most attractive in most industrialized countries (Frederick, Forbes, & Berezovskaya, 2008; Gray & Frederick, 2012; Swami et al., 2010). Women at the lower end of the ''normal'' range of BMI in industrialized countries are generally rated most attractive, and BMI is a particularly strong predictor of attractiveness ratings (Swami & Tovee, 2005; Tovée, Reinhardt, Emery, & Cornelissen, 1998). In parallel, women who have higher body masses tend to be less satisfied with their appearance than women with lower body masses (Frederick, Forbes, et al., 2007; Frederick et al., 2006). Popular media and news media often promote the idea that higher BMI is linked to poorer health, which causes people to have more negative attitudes toward women (and men) with higher body masses (Saguy, Frederick, & Gruys, 2014). Thus, slender women likely have the greatest bargaining hand in industrialized countries. It is unclear, however, whether having a stronger bargaining hand and greater attractiveness will lead to more or fewer sex partners for women.

Hypotheses and Research Questions

Hypothesis 1: Taller men will report a more extensive sexual history than shorter men (although this association may be curvilinear, given very tall men are not preferred by very short women). If the link between height and sex history is strongly linear across the entire height continuum, even at the high end, this may indicate that other factors than female choice for indirect benefits are leading to more sex partners among tall men (e.g., intrasexual competition; direct benefits such as ability to provide resources). If the association is strongly curvilinear (e.g., inverted U-shaped), this is consistent with the proposal that women's preferences are dictating men's mating opportunities.

Hypothesis 2: Men in middle BMI ranges will report a more extensive sexual history than underweight or obese men.

Research Question: What are the associations between height, BMI, and sexual history for women? We explored these links but were unable to make clear a priori predictions with the exception that thinner women, who have the strongest bargaining hand, would be less likely to be single.

Material and Method

Participant Recruitment

We analyzed the results of an online survey of heterosexual participants ($N = 60{,}058$) with a mean age of 37 ($SD = 11$). The present study is based on secondary analyses of anonymous data collected via a survey posted on the official website of NBC News for 10 days along with other websites (e.g., ELLE.com). The study was advertised as the ''ELLE/MSNBC.com Sex and Love Survey designed for both men and women'' in order to attract a diverse group of participants. Only participants who completed the survey via the MSNBC.com portal were included in the analyses.

Market research on NBCNews.com (formerly MSNBC.com) shows that at the time of the survey it routinely ranked among one of the most popular websites in the United States. Its 58-million unique monthly visitors include a broad diversity of people in terms of age, income, and political orientation (NBCNews.com Media Kit, 2012; note that msnbc.com, the general news website, was a different entity than MSNBC TV and had substantially different demographics, including approximately equal numbers of Democrats and Republicans). Data sets garnered through this site have been used to examine sexual jealousy (Frederick & Fales, 2014), sexual history (Fales, Frederick, Garcia, Gildersleeve, Haselton, & Fisher, in press), sexual regrets (Galperin et al., 2013), friendship (Gillespie, Frederick, Harari, & Grov, 2015; Gillespie, Lever, Frederick, & Royce, 2014), and aspects of body image (Frederick, Lever, & Peplau, 2007; Frederick et al., 2006; Frederick, Peplau, & Lever, 2008; Lever et al., 2007; Lever, Frederick, & Peplau, 2006; Peplau et al., 2009).

Participants

Of the 60,058 heterosexual participants, 52% were men ($M_{age} = 40$; $SD_{age} = 11$) and 48% were women ($M_{age} = 34$; $SD_{age} = 10$). Sexual orientation was determined in response to a question asking participants to identify as heterosexual, bisexual, or gay/lesbian. The reported ethnicities were 86% White/Caucasian ($n = 51{,}731$), 3% Black/African American ($n = 1{,}999$), 4% Hispanic/Latino(a) ($n = 2{,}313$), 2% Asian/Pacific Islander ($n = 1{,}449$), 3% other or mixed ethnicity ($n = 1{,}683$), and 2% preferred not to say ($n = 883$). The sample was diverse in terms of education, with participants reporting some high school education or less (1%), high school degree (9%), some college or associates degree (35%), college degree (36%), and postgraduate degree (19%). We did not collect information on what country they currently resided in. In another data set collected via this website, however, over 97% of participants indicated they were living in the United States and 99% reported living in the United States or Canada (Frederick, Sandhu, Morse, & Swami, 2015). Finally, in one data set participants were asked to indicate their zip code, and over 95% of participants provided a U.S. zip code, with 5% declining to provide a zip code (Gillespie et al., 2014, 2015).

Predictors

Height. Participants were asked "how tall are you" and were given a drop-down menu where they could record their height from 4′10″ or under to 6′7″+. *In regression analyses, the continuous measure of height was used as the predictor variable*. To facilitate data presentation, we then conducted a series of analyses where participants were split into six categories consisting of approximately 3-inch intervals, starting with the "average" category encompassing the U.S. average population height for men and for women ±1 inch, and then moving up and down in 3-inch categories. Due to the way height was distributed, some of the extreme categories (short women and extremely tall men) do not contain precisely 3-inch intervals.

We label these categories: very short, short, average, tall, very tall, and extremely tall. For men, these were very short (5′2″–5′4″; 157–164 cm; 1%), short (5′5″–5′7″; 165–171 cm; 9%), average (5′8″–5′10″; 172–178 cm; 33%), tall (5′11″–6′1″; 179–186 cm; 40%), very tall (6′2″–6′4″; 187–194 cm; 15%), and extremely tall (6′5″+; greater than 194 cm; 2%). For women, these were very short (4′11″ or less; 151 cm or less; 1%), short (5′0″–5′2″; 152–159 cm; 17%), average (5′3″–5′5″; 160–166 cm; 38%), tall (5′6″–5′8″; 167–174 cm; 33%), very tall (5′9″–5′11″; 175–182 cm; 10%), and extremely tall (6′0″–6′2″; 183–189 cm; 1%).

BMI. Participants were asked "how much do you weigh" and were given a drop-down menu where they could record their weight so that BMI could be calculated (weight/height^2). The drop-down started at <85 pounds and then in intervals of 5 from 86 to 200 (e.g., 85–89), and then by 10 from 200 to 300 (e.g., 200–209). These were recoded at the midpoint of each range (e.g., 87). *The continuous BMI variable was used in regression analyses*. The mean BMIs were in the overweight range for men ($M = 27.8$; $SD = 4.4$) and for women ($M = 25.5$; $SD = 5.9$).

We created BMI categories using Centers for Disease Control and Prevention (CDC) guidelines. The percentages of men and women who fell into each category of the BMI CDC variable were underweight (<18.5; 2%), healthy weight (18.5–24.99; 39%), overweight (25–29.99; 37%), obese (30–39.99; 15%), and morbidly obese (40.0+; 7%). For some analyses, we created a BMI CDC SPLIT variable where BMI was further broken down into nine categories: underweight (<18.5; 2%), low healthy (18.5–20.99; 10%), mid healthy (21–22.99; 13%), upper healthy (23–24.99; 16%), lower overweight (25–27.5; 20%), upper overweight (27.51–29.99; 16%), obese I (30–34.99; 15%), obese II (35–40; 6%), and obese III (>40; 2%).

Education. In order to retain the relative ordering of the education levels when using education as a predictor variable (Pasta, 2009), education was coded from lower (0 = *some high school education or less*) to higher (4 = *postgraduate degree*).

Ethnicity. This variable was dummy coded with Whites as the reference group.

Sex History Outcome Measures

For convenience, when referring to the collective set of outcome variables, we use the phrase "sex history variables" rather than "sex history and current relationship variables."

Number of sex partners. Participants indicated "In total, since you've been sexually active, about how many sex partners have you had?" Response options ranged from 0 to 14 by ones and then 15–20 (recoded 18), 21–25 (recoded 23), 26–50 (recoded 30), or more than 50 (recoded 50). Due to the fact that the variable was mostly continuous but with some unequal increases at the tail end of the variable, we also created two categorical outcome variables: more than 5 sex partners and more than 14 sex partners, as described below.

More than five sex partners. We created a dichotomous variable that indicated whether people had greater than five partners (56% of women and 58% of men; code = 1) or five or fewer (44% of women and 42% of men, code = 0).

More than 14 sex partners. We also created a dichotomous variable that indicated whether people had more than 14 partners (23% of women and 29% of men; code = 1) or 14 or fewer (77% of women and 71% of men; code = 0).

Extra-pair sex. Participants were asked "Have you had sex with another person since you became serious with your partner?" coded 0 = no and 1 = yes. Note that this item does not assess infidelity per se, but rather any instance in which an individual has sex with someone other than their partner (e.g., could include "swinging").

Relationship status. Participants indicated their current relationship status. The percentage of men and women indicating each status was not currently dating (9%), dating or seeing more than one person (3%), dating or seeing one person (17%), living together but not married (12%), married (54%), or remarried (5%). To test whether or not height or BMI predicted the likelihood of being single, people who were not currently dating were coded as 1 and all other participants were coded as 0.

Overview of Data Analysis Strategy

Regressions, multicollinearity, and curvilinear relationships. Linear regressions were conducted for the continuous sex partner number variable, and logistic regressions were conducted on all of the other outcome measures. Tolerance was high (0.90–1.0) and VIF was low (<2.5) for all analyses, suggesting that multicollinearity was not an issue. All continuous predictor variables were z scored. In all regression analyses, BMI and height were entered simultaneously to examine the linear associations between these variables and sexual history, as is commonly recommended (e.g., Michels, Greenland, & Rosner, 1998). BMI is one's body mass independent of their height (or more specifically, weight per unit of height^2), and as a result, height and BMI are essentially uncorrelated (in this

sample, $r = .05$ for women and $r = .01$ for men). The BMI measure enables us to directly compare body masses of people with differing heights. Entering BMI and height as predictors allows us to examine the effect of having a higher body mass given a certain height. The interaction term was entered to determine whether the association between BMI (i.e., weight per inch) and number of sex partners differs by height. The squared BMI and height variables were entered as predictors to test the curvilinear associations with sexual history.

One concern with these data is that BMI might change across the life span, and thus current BMI might differ from BMI at the time a person was accruing sex partners or having extra-pair sex. In this sample, there was a weak correlation between BMI and age for men ($r = .13$) and women ($r = .14$). We entered age as a predictor in the model.

Additionally, education level may be linked to height, BMI, and sexual behavior. We elected to treat education as a continuous predictor in order to examine the linear relationship between increasing education level and sexual history (see Pasta, 2009). There were weak but statistically significant correlations of education to height (men, $r = .04$; women, $r = .07$) and to BMI (men, $r = -.08$; women, $r = -.11$). Finally, ethnicity might covary with BMI, height, and sexual history, and, thus, ethnicity was included as a predictor. It is also possible that the link between the predictor variables and the sex history variables varies by ethnicity. Although we had no a priori hypotheses regarding ethnic differences, we analyzed the results without any interactions with ethnicity and again with all interactions of each predictor with ethnicity (dummy coded with White as the reference group). To conserve space and because few interactions were statistically significant, we describe any significant interactions in text rather than presenting all 24 interactions for each analysis in the table.

Skew and kurtosis. Skew and kurtosis were within acceptable ranges for all variables. The sex partner variable did, however, have a subgroup of individuals scoring relatively high, leading the mean to be higher than the median. We analyzed the results once with the sex partner outcome variable and once with a log-transformed version. The pattern of results did not change, and thus we report the results for the nonlog-transformed version. We also report median number of partners and the percentage of participants who have more than 5 and more than 14 sex partners according to their BMI and height categories.

BMI and height categorical variables. One-way analyses of variance were conducted to examine the main effects of height group (six categories) and the two BMI group variables (five and nine categories) on number of sex partners for each gender. Post hoc least significant difference tests were then conducted to examine whether groups differed from the central categories for the height groups, BMI CDC 5, and BMI CDC SPLIT 9 category variables (Table 1).

Statistical significance and effect size. Our large sample size enabled us to detect even miniscule effects. Further, we conducted numerous statistical tests, raising the possibility of Type I errors. As a result, we set the level for determining statistical significance at $p < .001$. Even with the more stringent criteria for statistical significance, however, correlation (r) and β (i.e., standardized coefficient) values as small as .02 were statistically significant when using the full samples of men or women. Therefore, in addition to reporting statistical significance, we also attend to effect size. There are established rough guidelines for interpreting Cohen's d effect sizes as small (.20), moderate (.50), or large (.80; Cohen, 1988).

Overview of data presentation in tables. Table 1 shows the mean sex partner number for height and BMI categories in men and women. Table 2 shows the percentage of participants who had more than 5 sex partners, had more than 14 partners, who engaged in extra-pair sex, and who are currently single. Table 3 presents the linear regression analyses predicting the number of sex partners. Table 4 presents the results of logistic regression analyses predicting the dichotomous outcome variables for the full samples of men and women.

Overview of data presentation in figures. Figure 1 shows the mean sex partner number for heterosexual men and women for each inch of height containing at least 25 participants. Figure 2 shows the mean sex partner number for each BMI unit for which there are at least 25 participants.

Results

Hypothesis 1: Taller men will report a more extensive sexual history (although this association may be curvilinear).

Mean differences. Contrary to our expectations, as shown in Table 1, there was little variation in mean number of sex partners across most of the height continuum. Looking at mean differences in the number of partners between the tall men and other categories, only the very short men differed from tall men by an effect size larger than $d = .20$, reporting fewer partners ($d = -.22$). The mean number of partners for every inch of height can be seen in Figure 1.

Regressions. Regression analyses examining height as a predictor found that height was a weak but statistically significant predictor of number of sex partners in the overall sample (linear $\beta = .07$; curvilinear $\beta = -.04$), with height being linked to higher sex partner number more so at the lower end of the height continuum than at the higher end (Table 3). Adding interaction terms with ethnicity did not notably increase percentage of variation explained in number of sex partners by the predictors (adjusted R^2 from .044 to .046). None of the interactions between ethnicity and height or height^2 were significant at the $p < .001$ level, although the interaction of Black ethnicity with height was close to this threshold ($p = .005$). At first glance, it appeared that the linear association between height and sex partner number was stronger for Black men than for White men, but this was primarily due to the fact that very short Black men (5′2″–5′4″; 158–163 cm) reported substantially

Table 1. Sex Partner Number by Height and BMI Categories in Men and Women.

	Men					Women				
	Mean	*SD*	Median	*d*	*d*	Mean	*SD*	Median	*d*	*d*
Height category										
Very short	9.4	11.6	5	−.19**	−.22***	8.2	8.4	5	−.16**	−.20***
Short	11.0	11.8	7	−.06*	−.08***	9.3	9.4	6	−.04**	−.08***
Average	11.7	12.3	7	Ref	−.02*	9.7	9.9	6	Ref	−.04*
Tall	12.0	12.5	7	.02*	Ref	10.1	10.1	7	.04*	Ref
Very tall	12.1	13.0	7	.03*	.01	10.6	10.8	7	.09***	.05*
Extremely tall	12.3	13.1	7	.05	.02	10.0	10.1	6	.03	−.01
BMI CDC										
Underweight	8.2	10.9	4	−.23	−.39***	7.8	8.0	5	−.20***	−.26***
Normal weight	10.9	12.1	6	Ref	−.15***	9.6	9.6	6	Ref	−.06***
Overweight	12.8	12.8	8	.15***	Ref	10.2	10.2	7	.06***	Ref
Obese	11.7	12.6	7	.06**	−.09***	10.6	10.8	7	.09***	.04
Obese III	9.3	10.8	5	−.14***	−.30***	10.3	10.8	7	.06*	.01
BMI CDC SPLIT										
Underweight	8.2	10.9	4	−.17	−.40***	7.8	8.0	5	−.22***	−.26***
Low healthy	8.5	10.8	4	−.15*	−.37***	9.2	9.4	6	−.05	−.10***
Mid healthy	10.2	11.7	6	Ref	−.22***	9.8	9.7	7	Ref	−.04*
Upper healthy	11.6	12.3	7	.11***	−.10***	9.9	9.8	7	.01	−.03
Lower overweight	12.9	12.8	8	.22***	Ref	10.2	10.2	7	.04	Ref
Upper overweight	12.6	12.8	8	.19***	−.02	10.2	10.1	7	.03	.00
Obese I	11.7	12.6	7	.12***	−.09***	10.6	10.8	7	.07*	.04
Obese II	9.4	10.8	5	−.06	−.30***	10.1	10.6	7	.03	−.01
Obese III	8.7	10.7	5	−.13	−.36***	10.6	11.1	6	.07	.04
Overall	11.8	12.5	7	—		9.8	10.0	6	—	

Note. BMI = body mass index; CDC = Centers for Disease Control and Prevention. Cohen's *d* represents the difference from the reference category in that column for each variable. For example, average height men are the reference category for the first column examining height group differences in number of sex partners. A positive Cohen's *d* indicates that the mean in the current category is higher than the mean in the reference category. A negative Cohen's *d* indicates the reverse.
*$p < .05$. **$p < .01$. ***$p < .001$.

fewer partners than other Black men. When restricting the sample to men 5′5″ (165 cm) or taller, the associations of height to sex partners for Black men were similar to other ethnic groups and there was no significant interaction of Black ethnicity with height ($p = .63$).

Height did not predict history of engaging in extra-pair sex, but there were weak linear and curvilinear associations of height with most of the other categorical sex history variables (Table 4). There were no significant interactions with ethnicity.

Hypothesis 2: Men in middle BMI ranges will report a more extensive sexual history than underweight or obese men

Mean differences. Consistent with the hypothesis that men in the middle body mass ranges would have the most partners, overweight men had the highest number of sex partners (median = 8, mean = 12.8; see Table 1). Compared to the overweight men, fewer partners were reported by underweight men (median = 4, mean = 8.2, $d = -.40$) and obese III men (median = 5, mean = 9.3, $d = -.30$). Differences from other groups were smaller than $d = .20$.

Regressions. Consistent with our expectations, there was a curvilinear association between BMI and number of sex partners in the overall sample, and technically, the linear association was statistically significant despite the small effect size (linear $\beta = .03$; curvilinear $\beta = -.10$; Table 3). In particular, men in the middle BMI ranges had reported having more partners than men at the ends of the distribution. This pattern can be seen clearly in Figure 2, where mean number of sex partners is plotted for each unit of BMI. There were no significant interactions with ethnicity.

The linear and curvilinear associations of BMI and BMI^2 were generally weak with the categorical sex history variables, with the exception of likelihood of being single (linear OR = 0.62; curvilinear OR = 1.22; Table 4). Relatively thinner men were more likely to be single, with little variation among overweight–morbidly obese men. There were no significant interactions with ethnicity.

Research Question: What are the associations between height, BMI, and sexual history for women?

All other comparisons between tall women and other women were smaller than $d = .20$ in size, except very short women had fewer partners than tall women ($d = -.20$; Table 1). Underweight women reported the fewest partners (7.8), which were fewer partners than both healthy weight ($d = -.20$) and

Table 2. Percentage of Participants With Differing Sexual Experiences by Height and BMI.

	Men				Women			
	More than 5 sex partners (%)	More than 14 sex partners (%)	Extra-pair sex (%)	Currently single (%)	More than 5 sex partners (%)	More than 14 sex partners (%)	Extra-pair sex (%)	Currently single (%)
Height groups								
Very short	49	19	20	14	50	17	15	12
Short	56	26	23	10	54	21	14	10
Average	58	29	22	9	56	22	14	10
Tall	59	30	22	8	57	24	14	10
Very tall	57	30	22	8	59	25	14	12
Extremely tall	58	30	22	7	53	27	14	11
BMI CDC groups								
Underweight	40	18	17	20	49	16	14	11
Normal weight	54	26	19	12	56	22	14	10
Overweight	62	32	23	7	58	25	14	10
Obese	57	28	23	6	58	26	14	11
Morbid obese	48	21	19	8	55	24	15	14
BMI CDC SPLIT								
Underweight	40	18	17	20	49	16	14	11
Low healthy	43	19	17	21	54	21	13	10
Mid healthy	52	24	18	15	57	23	14	10
Upper healthy	57	29	21	10	57	22	14	10
Low overweight	63	33	23	8	58	25	14	11
Upper overweight	62	32	23	6	57	25	13	10
Lower obese	57	28	23	6	58	26	14	11
Upper obese	49	22	19	8	56	24	15	12
Morbid obese	45	19	18	10	55	25	15	16
Overall	58	29	22	8	56	23	14	11

Note. BMI = body mass index; CDC = Centers for Disease Control and Prevention.

overweight women ($d = -.26$). Looking across all other BMI CDC and BMI CDC SPLIT categories, the mean number of sex partners ranged from 9.2 to 10.6. In regressions, however, all associations were quite weak even when significant (Tables 3 and 4).

Discussion

Key Findings for Men

Height. The existing literature has generally found that relatively tall men (but not extremely tall men) are consistently considered more attractive to women (Courtiol et al., 2010; Salska et al., 2008; Swami et al., 2008). Interestingly, however, men's reported sexual behavior only partially reinforced the preference data. Consistent with the idea that women prefer relatively tall men, the shortest men in the sample reported fewer partners than other men. These findings confirm that height is relevant on the mating market. Across most of the height continuum, however, there was little variation in mean or median number of reported sex partners. Further, men between 5′7″ and 6′3″ (170–191 cm) varied little in whether they had more than 5 partners, had more than 14 partners, engaged in extra-pair sex, or were currently single. Given that very tall men may have a smaller dating pool, the lack of downturn among taller men in number of sex partners may indicate that these males are successfully using intrasexual competition or direct benefits to obtain more mating opportunities, a point future research may clarify.

The relatively limited variation in sex partner number for men across much of the height continuum is difficult to explain. Research on other traits generally considered attractive to women has found that men with these traits have more sex partners (e.g., muscularity; Frederick & Haselton, 2007; Lassek & Gaulin, 2009). One possibility is that women may prefer relatively tall height, but other factors more strongly dictate sexual behavior. Research on the relative importance women place on height versus other traits would clarify this matter. The existing research, however, suggests that height is an important component of women's mate preferences: One study

Table 3. Linear Regression Predicting Number of Sex Partners.

	Men	Men with interactions	Women	Women with interactions
	β	β	β	β
Height	.07***	.05***	.04***	.04***
Height^2	−.04***	−.03**	−.01	−.01
BMI	.03**	.02*	.04***	.03***
BMI^2	−.10***	−.10***	−.03***	−.03***
Height × BMI	−.01	−.01	.01	.02
Age	.15***	.14***	.15***	.15***
Education	−.06***	−.06***	−.03***	−.03***
Black	.10***	.09***	.03***	.02***
Asian	−.03***	−.04***	−.05***	−.04***
Hispanic	.04***	.04***	−.02*	.00
Other	.03***	.03***	.02***	.03**
df	11, 31,407	35, 31,383	11, 27,744	35, 27,720
F	133***	44***	81***	27***
Adjusted R^2	.044	.046	.031	.032

Note. BMI = body mass index. For the ethnicity variable, White men were used as the reference group. For the analyses where the interactions between ethnicity and the other predictors were examined, none of 24 interactions terms were significant at the $p < .001$ level and thus are not shown.
*$p < .05$. **$p < .01$. ***$p < .001$.

found that women gave height the fifth highest rating out of 21 traits for how desirable it is in their ideal mate (Montoya, 2007). It is possible that for most women there is a certain minimal threshold of height, after which they will consider a male as a potential sex partner, and thus men above that height end up with similar numbers of sex partners (e.g., Salska et al., 2008). Finally, if relatively taller men are chosen more often as long-term partners, this may reduce the total number of sex partners they have time or ability to pursue. Future research can determine if the patterns found in this study are replicable.

Body mass. Men in the normal and overweight categories reported the highest number of sex partners and engaged in extra-pair sex more often than men in the underweight or obese categories. As previously mentioned, it may be the men in the normal and overweight categories who are perceived to be the most athletic, healthy, powerful, or muscular, and previous research has shown that men in these middle BMI ranges (normal/healthy and overweight) feel most confident in their bodies (Frederick, Forbes, et al., 2007; Frederick et al., 2006; Peplau et al., 2009). Although it might be initially surprising that overweight men reported the highest number of partners, it is important to note that the medical classification overweight does not necessarily map onto social perceptions of who is overweight. Our findings suggest that possessing this body type, or associated traits (e.g., confidence), may translate to these men having higher numbers of sex partners.

Key Findings for Women

Height. Our examination of the relationships between height and sex partner number for women was exploratory. These analyses generally revealed no associations or very weak associations between height and sexual history. Very short women reported fewer partners compared to tall women (although this effect size was small).

Body mass. Generally speaking, there was little variation in the number of sex partners for women of differing body masses. Underweight women, however, reported fewer partners than other women. This parallels the finding that underweight men had fewer partners as well. Very slender women may be highly dissatisfied with their weight and be suffering from anorexia and thus motivated to not expose their bodies. Additionally, however, being in the underweight category is associated with relatively high mortality rate (Flegal, Graubard, Williamson, & Gail, 2005). It is also possible that underweight individuals may be more likely to be suffering from a variety of ailments and wasting diseases that cause weight loss and thus may have fewer sex partners because they are more likely to be dealing with serious health issues. Alternatively, attractiveness may play a role here: Very slender women may be highly attractive (Kościński, 2013), but attractive women may also be very choosy (Buss & Shackelford, 2008) and, therefore, have fewer partners.

Limitations and Strengths

This study provided a unique look at the links between height, BMI, and sexual history. Although our sample was unusually large and diverse, it was not nationally representative. It is possible that the survey title "Sex and Love" appealed to people with more liberal attitudes toward sex. For example, the median number of sex partners reported in one nationally representative survey of adults aged 30–44 was around seven female sexual partners for men and four male sexual partners for women (Mosher, Chandra, & Jones, 2005). The median number of sex partners in our sample was slightly higher (eight for men and eight for women ages 30–44). On the other hand, the rates of extra-pair sex in our sample were similar to other large-scale studies (Blow & Hartnett, 2005). A further issue is what, precisely, number of sex partners indicates. It is not a measure of reproductive success and is not a direct measure of sexual strategy (e.g., a man with 10 partners may have had multiple partners simultaneously or a series of monogamous relationships). We took number of sex partners to be one rough indicator of men's appeal on the mating market, but multiple factors influence number of sex partners (e.g., attractiveness, how coercive a male is, and income).

A related issue is that some people might purposely misreport answers to key variables in socially desirable ways. Furthermore, when reporting number of sex partners, different people might be using different criteria for who counts as a sex partner (Brown & Sinclair, 1999; Cecil, Bogart, Wagstaff, Pinkerton, & Abramson, 2002). Men and women may not always accurately report their height and/or weight. In a review of 64 studies on self-reported versus directly measured height and weight, self-reported measures differ only slightly from people's actual heights and weights (Gorber, Tremblay, Moher, &

Table 4. Logistic Regression Predicting Differing Sexual History by Height and BMI.

	Full sample							
	Men				Women			
	>5 Sex partners OR	>14 Sex partners OR	Extra-pair sex OR	Currently single OR	>5 Sex partners OR	>14 Sex partners OR	Extra-pair sex OR	Currently single OR
Height	1.13***	1.21***	1.09	0.82***	1.01	1.13***	1.08	1.15**
Height^2	0.94**	0.93***	0.98	1.04	0.98	0.99	1.03	1.03
BMI	1.06*	1.04*	1.14***	0.62***	1.01	1.09***	0.97	1.08**
BMI^2	0.86***	0.84***	0.91***	1.22***	0.97***	0.97***	1.01	1.03**
Height × BMI	0.99	0.99	0.99	1.06	1.02	1.04	1.02	1.07**
Age	1.26***	1.30***	1.24***	0.71***	1.34***	1.31***	1.21***	1.08**
Education	0.89***	0.88***	0.98	0.86***	0.94***	0.95**	0.89***	1.10***
Black	2.43***	3.10**	2.89***	1.50*	1.37**	1.17	2.20***	2.56***
Asian	0.62***	0.42***	1.13	1.01	0.56*	0.88	1.63	1.65
Hispanic	1.61***	1.57***	2.30***	1.16	1.04	0.60	1.38	1.16
Other	1.23	1.37*	1.62***	1.01	1.40*	1.39*	1.49*	1.06
df	35	35	35	35	35	35	35	35
n	31,419	31,419	28,759	31,419	27,756	27,756	24,842	27,756
χ^2	1,179***	1,170***	569***	790***	778***	578***	245***	244***
Nagelkerke R^2	.050	.052	.030	.056	.037	.031	.018	.018
Nagelkerke R^2 model without interactions	.046	.050	.028	.053	.035	.029	.017	.016

Note. BMI = body mass index; OR = odds ratio. For the ethnicity variable, Whites were used as the reference group. The 24 interaction terms between ethnicity and the other variables were included in the analyses but are not shown due to the fact that few interactions were significant and adding the interactions did not notably increase the percentage of variance explained.
*p < .05. **p < .01. ***p < .001.

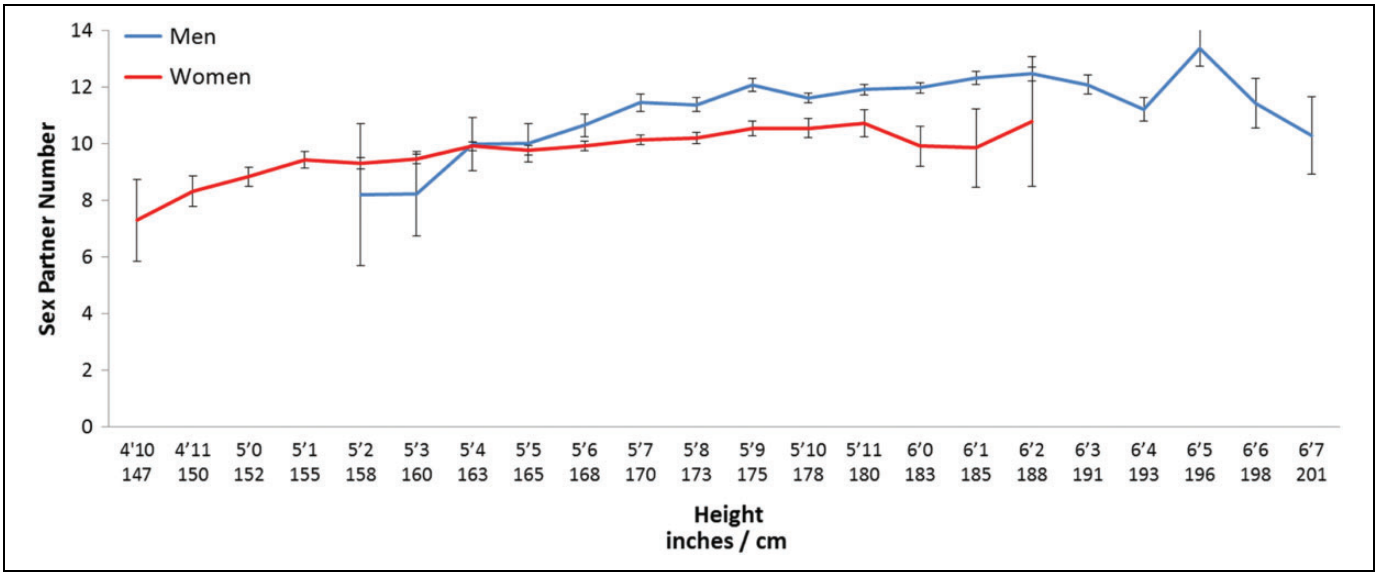

Figure 1. Height and mean sex partner number with standard errors for heterosexual men and women. Means and standard errors are shown for each height. All heights listed have 50–5,114 participants with the exception of 5′2″ men (n = 25) and women 4′10″ and under (n = 47). Heights with fewer than 25 participants are not shown.

Gorber, 2007). Consistent with these findings, a study of over 4,000 British men and women found that self-reported and measured height, weight, and BMI were strongly correlated (rs > .90; Spencer, Appleby, Davey, & Key, 2002). Systematic biases in responses across participants, however, could be problematic. For example, if men who exaggerate their height by an inch or so are more likely to exaggerate their number of sex partners, then this study may overestimate the strength of the

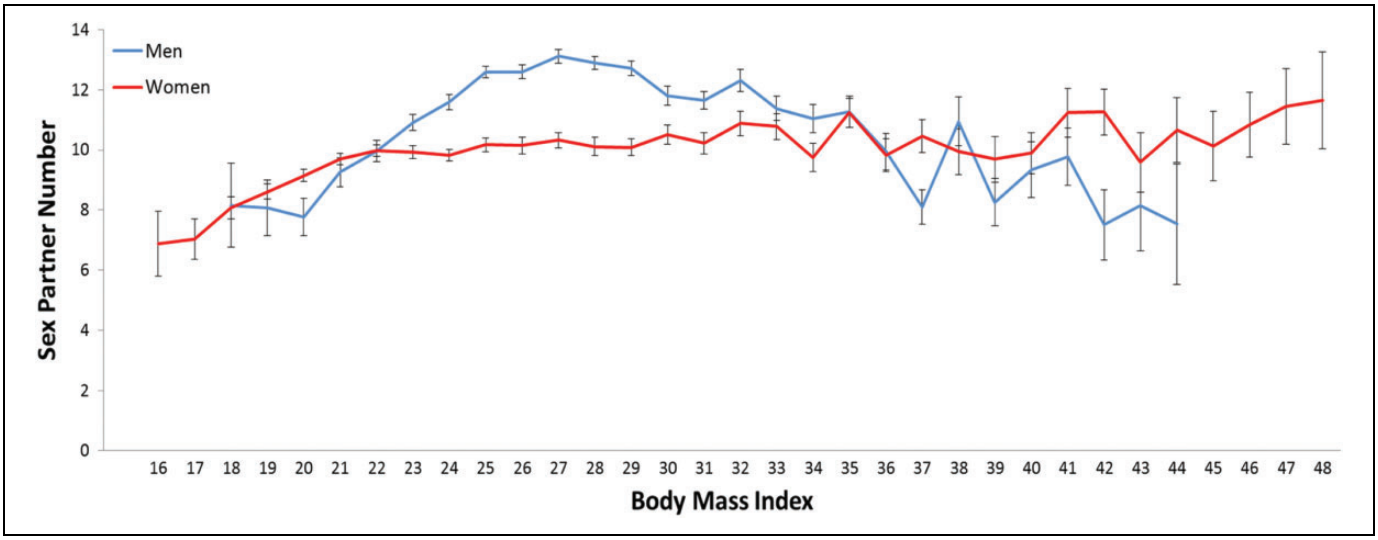

Figure 2. Body mass index (BMI) and mean sex partner number for heterosexual men and women. Means and standard errors are shown for each BMI unit (e.g., 16 = 15.5–16.49). All BMIs listed have 50–4,407 participants with the exception of men with BMIs of 44 ($n = 38$) and women with BMIs of 48 ($n = 38$). BMIs with fewer than 25 participants are not shown.

association between height and number of sex partners. Alternatively, if shorter men are more likely to overestimate their number of sex partners, this would cause association between height and sex partner number to be underestimated. Replicating this research with measured height and weight is a key future direction. The research was also limited to a U.S. sample, and the distribution of BMIs in hunter-gatherer and hunter-horticulturalist societies likely differs substantially from the United States, making it important to examine how body fat distribution and height are related to sexual behavior in less industrialized settings.

A further limitation is that we only had reports of current weight from participants. Some people may experience substantial fluctuations in weight, and, therefore, their current weight may not reflect the weight they had when they were accruing sex partners. When examining links to sexual history, it would be valuable to also ask participants how many partners they have had recently or while at their current weight.

This survey suffered the same limitation that most survey research encounters: results were derived only from people who chose to participate in the research study. Internet samples, including ours, tend to include participants who are relatively more educated and have higher income than the national population, but they also tend to be more diverse with respect to gender, age, socioeconomic status, and geographic region than nonprobability samples generated by many traditional data-gathering methods (Gosling, Vazire, Srivastava, & John, 2004). Selection biases introduced by differential access to the Internet have been minimized, as Internet use has grown more commonplace (Rainie & Horrigan, 2005; U.S. Census Bureau, 2012). Given the broad-based appeal of the news website, we were provided with a demographically diverse sample and an opportunity to compare men and women who differed substantially on this study's variables of interest. Surveys can be completed with ease from the privacy of respondents' homes or workplaces, thereby reaching individuals who would not otherwise have the opportunity to participate in research studies. Our large sample enabled us to examine the data not only by broad categories but also in detail by individual height in inches and across the entire BMI continuum.

Conclusion

Height and body mass are traits that may be useful cues about health, social status, and heritable fitness. These qualities are valued by women, suggesting that tall men would have more sex partners, whereas short men would have fewer. Surprisingly, however, taller men did not report substantially more sex partners than men other than very short men. This was surprising, given women's clear preferences for relatively taller men in Western cultures. These findings raise interesting questions regarding the mating strategies of men with average to somewhat below average heights, and how well-stated preferences for height map on to actual sexual behavior.

Acknowledgments

We would like to thank the editor and reviewers for their exceptionally helpful comments and suggestions for additional data analyses. We would also like to thank *ELLE* and *MSNBC*.com for access to the Sex and Love Survey.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

Blaker, N. M., Rompa, I., Dessing, I. H., Vriend, A. F., Herschberg, C., & Van Vugt, M. (2013). The height leadership advantage in men and women: Testing evolutionary psychology predictions about the perceptions of tall leaders. *Group Processes & Intergroup Relations*, *16*, 17–27.

Blow, A. J., & Hartnett, K. (2005). Infidelity in committed relationships II: A substantive review. *Journal of Marital and Family Therapy*, *31*, 217–233.

Boyson, A. R., Pryor, B., & Butler, J. (1999). Height as power in women. *North American Journal of Psychology*, *1*, 109–114.

Brown, N. R., & Sinclair, R. C. (1999). Estimating number of lifetime sexual partners: Men and women do it differently. *Journal of Sex Research*, *36*, 292–297.

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, *100*, 204.

Buss, D. M., & Shackelford, T. K. (2008). Attractive women want it all: Good genes, economic investment, parenting proclivities, and emotional commitment. *Evolutionary Psychology*, *6*, 134–146.

Camhi, S. M., Bray, G. A., Bouchard, C., Greenway, F. L., Johnson, W. D., Newton, R. L., . . . Katzmarzyk, P. T. (2011). The relationship of waist circumference and BMI to visceral, subcutaneous and total body fat: Sex and race differences. *Obesity*, *19*, 402–408.

Carrier, D. R. (2011). The advantage of standing up to fight and the evolution of habitual bipedalism in Hominins. *PLoS ONE*, *6*, e19630.

Cassidy, C. M. (1991). The good body: When big is better. *Medical Anthropology*, *13*, 181–213.

Cecil, H., Bogart, L., Wagstaff, D., Pinkerton, S., & Abramson, P. (2002). Classifying a person as a sexual partner: The impact of contextual factors. *Psychology and Health*, *17*, 221–234.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Courtiol, A., Raymond, M., Godelle, B., & Ferdy, J. B. (2010). Mate choice and human stature: Homogamy as a unified framework for understanding mating preferences. *Evolution*, *64*, 2189–2203.

Dixson, B. J., Dixson, A. F., Bishop, P. J., & Parish, A. (2010). Human physique and sexual attractiveness in men and women: A New Zealand–US comparative study. *Archives of Sexual Behavior*, *39*, 798–806.

Fales, M. R., Frederick, D. A., Garcia, J. R., Gildersleeve, K. A., Haselton, M. G., & Fisher, H. E. (in press). Mating markets and bargaining hands: Predictors of mate preferences for attractiveness and resources in two national U.S. studies. *Personality and Individual Differences*.

Flegal, K. M., Graubard, B. I., Williamson, D. F., & Gail, M. H. (2005). Excess deaths associated with underweight, overweight, and obesity. *Journal of the American Medical Association*, *293*, 1861–1867.

Frederick, D. A., Buchanan, G. M., Sadeghi-Azar, L., Peplau, L. A., Haselton, M. G., Berezovskaya, A., & Lipinski, R. E. (2007). Desiring the muscular ideal: Men's body satisfaction in the United States, Ukraine, and Ghana. *Psychology of Men and Masculinity*, *8*, 103–117.

Frederick, D. A., & Fales, M. R. (2014). Upset over sexual versus emotional infidelity among gay, lesbian, bisexual, and heterosexual adults. *Archives of Sexual Behavior* [Online version ahead of print]. Retrieved from http://dx.doi.org/10.1007/s10508-014-0409-9

Frederick, D. A., Fessler, D. M. T., & Haselton, M. G. (2005). Do representations of male muscularity differ in men's and women's magazines? *Body Image*, *2*, 81–86.

Frederick, D. A., Forbes, G. B., & Berezovskaya, A. (2008). Body dissatisfaction and perceptions of the attractive female body among women and men from the Ukraine, Ghana, and the United States. *Psychological Topics*, *17*, 203–219.

Frederick, D. A., Forbes, G. B., Grigorian, K. E., & Jarcho, J. M. (2007). The UCLA body project I: Gender and ethnic differences in self-objectification and body satisfaction among 2,206 undergraduates. *Sex Roles*, *57*, 317–327.

Frederick, D. A., & Haselton, M. G. (2007). Why is male muscularity sexy? Tests of the fitness indicator hypothesis. *Personality and Social Psychology Bulletin*, *33*, 1167–1183.

Frederick, D. A., Lever, J., & Peplau, L. A. (2007). Interest in cosmetic surgery and body image: Views of men and women across the lifespan. *Plastic and Reconstructive Surgery*, *120*, 1407–1415.

Frederick, D. A., Peplau, L. A., & Lever, J. (2006). The swimsuit issue: Correlates of body image in a sample of 52,677 heterosexual adults. *Body Image*, *3*, 413–419.

Frederick, D. A., Peplau, L. A., & Lever, J. (2008). The Barbie mystique: Satisfaction with breast size and shape across the lifespan. *International Journal of Sexual Health*, *20*, 200–211.

Frederick, D. A., Reynolds, T. A., & Fisher, M. L. (2013). The importance of female choice: Evolutionary perspectives on constraints, expressions, and variations in female mating strategies. In R. Chang, M. Fisher, & J. Garcia (Eds.), *Evolution's empress: Darwinian perspectives on the nature of women* (pp. 304–329). Oxford, UK: Oxford Press.

Frederick, D. A., Sandhu, G., Morse, P., & Swami, V. (2015). *Correlates of body image in a national sample: Personality, attachment style, television viewing, self-esteem, life satisfaction, sex life satisfaction, and body mass index*. Manuscript submitted for publication.

Frederick, D. A., Swami, V., & The 56 Members of the International Body Project. (2010). *Preferences for muscularity in 26 countries across 10 world regions: Results from the International Body Project I.* Western Psychological Association Conference, Cancun, Mexico.

Gallup, G. G., Jr., & Frederick, D. A. (2010). The science of sex appeal: An evolutionary perspective. *Review of General Psychology*, *14*, 240–250.

Galperin, A., Haselton, M. G., Frederick, D. A., Poore, J., von Hippel, W., Buss, D. M., & Gonzaga, G. C. (2013). Sexual regret: Evidence for evolved sex differences. *Archives of Sexual Behavior*, *42*, 1145–1161.

Gangestad, S. W., & Simpson, J. A. (2000). The evolution of human mating: Trade-offs and strategic pluralism. *Behavioral and Brain Sciences*, *23*, 573–587.

Gillespie, B. J., Frederick, D. A., Harari, L., & Grov, C. (2015). Homophily, close friendship, and life satisfaction among gay,

lesbian, heterosexual, and bisexual men and women. *PLoS ONE*, *10*, e0128900.

Gillespie, B. J., Lever, J., Frederick, D. A., & Royce, T. (2014). Close adult friendships, gender, and the life cycle. *Journal of Personal and Social Relationships* [Online version ahead of print]. Retrieved from http://dx.doi.org/10.1177/0265407514546977

Gorber, S. C., Tremblay, M., Moher, D., & Gorber, B. (2007). A comparison of direct vs. self-report measures for assessing height, weight and body mass index: A systematic review. *Obesity Reviews*, *8*, 307–326.

Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should we trust web-based studies? A comparative analysis of six preconceptions about internet questionnaires. *American Psychologist*, *59*, 93–104.

Gray, P. B., & Frederick, D. A. (2012). Body image and body type preferences in St. Kitts, Caribbean: A cross-cultural comparison with U.S. samples regarding attitudes towards muscularity, body fat, and breast size. *Evolutionary Psychology*, *10*, 631–655.

Hrdy, S. B. (1981). *The woman that never evolved*. Cambridge, MA: Harvard University Press.

Judge, T. A., & Cable, D. M. (2004). The effect of physical height on workplace success and income: Preliminary test of a theoretical model. *Journal of Applied Psychology*, *89*, 428–441.

Kaplan, H. S., & Gangestad, S. W. (2005). Life history theory and evolutionary psychology. In D. Buss (Ed.), *The handbook of evolutionary psychology* (pp. 68–95). Hoboken, NJ: John Wiley & Sons.

Kokko, H., Brooks, R., Jennions, M. D., & Morley, J. (2003). The evolution of mate choice and mating biases. *Proceedings of the Royal Society Biological Sciences*, *270*, 653–664.

Kolata, G. (2004, November 28). Tell the truth: Does this index make me look fat? *The New York Times*. Retrieved April 5, 2004, from http://www.nytimes.com/2004/11/28/weekinreview/28kola.html?_r=0

Kościński, K. (2013). Attractiveness of women's body: Body mass index, waist–hip ratio, and their relative importance. *Behavioral Ecology*, *24*, 914–925.

Kurzban, R., & Weeden, J. (2005). HurryDate: Mate preferences in action. *Evolution and Human Behavior*, *26*, 227–244.

Lassek, W. D., & Gaulin, S. J. C. (2009). Costs and benefits of fat-free muscle mass in men: Relationship to mating success, dietary requirements, and native immunity. *Evolution and Human Behavior*, *30*, 322–328.

Lever, J., Frederick, D. A., Laird, K., & Sadeghi-Azar, L. (2007). Tall women's satisfaction with their height: General population data challenge assumptions behind medical interventions to stunt girls' growth. *Journal of Adolescent Health*, *40*, 192–194.

Lever, J., Frederick, D. A., & Peplau, L. A. (2006). Does size matter? Men's and women's views on penis size across the lifespan. *Psychology of Men & Masculinity*, *7*, 129–143.

Macgregor, S., Cornes, B. K., Martin, N. G., & Visscher, P. M. (2006). Bias, precision and heritability of self-reported and clinically measured height in Australian twins. *Human Genetics*, *120*, 571–580.

McEvoy, B. P., & Visscher, P. M. (2009). Genetics of human height. *Economics & Human Biology*, *7*, 294–306.

Michels, K. B., Greenland, S., & Rosner, B. A. (1998). Does body mass index capture the relation of body composition and body size to health outcomes? *American Journal of Epidemiology*, *147*, 167–172.

Miller, G. (2000). *The mating mind*. New York, NY: Anchor.

Montoya, R. M. (2007). Gender similarities and differences in preferences for specific body parts. *Current Research in Social Psychology*, *13*, 133–144.

Mosher, W. D., Chandra, A., & Jones, J. (2005). *Sexual behavior and selected health measures: Men and women 15–44 years of age, United States. Advance data from vital and health statistics No 362*. Hyattsville, MD: National Center for Health Statistics.

Murasko, J. E. (2013). Associations between household income, height, and BMI in contemporary U.S. schoolchildren. *Economics & Human Biology*, *11*, 185–196.

NBCNews. (2012). *Media kit*. Retrieved from http://www.nbcnews.com/id/31066137

Nettle, D. (2002a). Height and reproductive success in a cohort of British men. *Human Nature*, *13*, 473–491.

Nettle, D. (2002b). Women's height, reproductive success and the evolution of sexual dimorphism in modern humans. *Proceedings of the Royal Society of London B*, *269*, 1919–1923.

Pasta, D. J. (2009, May). Learning when to be discrete: Continuous vs. categorical predictors. Statistical Analysis System (SAS) Global Forum, Washington, DC. Retrieved from support.sas.com/resources/papers/proceedings09/248-2009.pdf

Pawlowski, B. (2003). Variable preferences for sexual dimorphism in height as a strategy for increasing the pool of potential partners in humans. *Proceedings of the Royal Society of London B*, *270*, 709–712.

Pawlowski, B., & Dunbar, R. I. (1999). Impact of market value on human mate choice decisions. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, *266*, 281–285.

Pawlowski, B., & Koziel, S. (2002). The impact of traits offered in personal advertisements on response rates. *Evolution and Human Behavior*, *23*, 139–149.

Peplau, L. A., Frederick, D. A., Yee, C. K., Maisel, N., Lever, J., & Ghavami, N. (2009). Body image satisfaction in heterosexual, gay, and lesbian adults. *Archives of Sexual Behavior*, *38*, 713–725.

Puts, D. A. (2010). Beauty and the beast: Mechanisms of sexual selection in humans. *Evolution and Human Behavior*, *31*, 157–175.

Rainie, L., & Horrigan, J. (2005). *A decade of adoption: How the Internet has woven itself into American life*. Retrieved from http://www.pewinternet.org/PPF/r/148/report_display.asp

Ranasinghe, P., Jayawardana, N., Constantine, G. R., Sheriff, R., Matthews, D. R., & Katulanda, P. (2011). Patterns and correlates of adult heights in Sri Lanka. *Economics & Human Biology*, *9*, 23–29.

Saguy, A. C., Frederick, D., & Gruys, K. (2014). Reporting risk, producing prejudice: How news reporting on obesity shapes attitudes about health risk, policy, and prejudice. *Social Science & Medicine*, *111*, 125–133.

Salska, I., Frederick, D. A., Pawłowski, B., Reilly, A. H., Laird, K. T., & Rudd, N. A. (2008). Conditional mate preferences: Factors influencing preferences for height. *Personality and Individual Differences*, *44*, 203–215.

Schmitt, D. P., Jonason, P. K., Byerley, G. J., Flores, S. D., Illbeck, B. E., O'Leary, K. N., & Qudrat, A. (2012). A reexamination of sex differences in sexuality new studies reveal old truths. *Current Directions in Psychological Science*, *21*, 135–139.

Sear, R. (2010). Height and reproductive success: Bigger is always better? In U. J. Frey, C. Stormer, & K. P. Willfuhr (Eds.), *Homo-novus: A human without illusions* (pp. 127–143). Heidelberg, Germany: Springer.

Silventoinen, K., Kaprio, J., Lahelma, E., Viken, R. J., & Rose, R. J. (2001). Sex differences in genetic and environmental factors contributing to body-height. *Twin Research*, *4*, 25–29.

Silventoinen, K., Krueger, R. F., Bouchard, T. J., Kaprio, J., & McGue, M. (2004). Heritability of body height and educational attainment in an international context: Comparison of adult twins in Minnesota and Finland. *American Journal of Human Biology*, *16*, 544–555. doi:10.1002/ajhb.20060

Sorokowski, P., & Butovskaya, M. L. (2012). Height preferences in humans may not be universal: Evidence from the Dagota people of Tanzania. *Body Image*, *9*, 510–516.

Sorokowski, P., Sorokowska, A., Fink, B., & Mberira, M. (2012). Variable preferences for sexual dimorphism in stature (SDS) might not be universal: Data from a semi-nomad population (Himba) in Namibia. *Journal of Cross-Cultural Psychology*, *43*, 32–37.

Spencer, E. A., Appleby, P. N., Davey, G. K., & Key, T. J. (2002). Validity of self-reported height and weight in 4808 EPIC–Oxford participants. *Public Health Nutrition*, *5*, 561–565.

Spitzer, B., Henderson, K., & Zivian, M. A. (1999). A comparison of population and media body sizes for American and Canadian women. *Sex Roles*, *700*, 545–565.

Stearns, S. C. (1992). *The evolution of life histories*. Oxford, England: Oxford University Press.

Stulp, G., & Barrett, L. (2014). Evolutionary perspectives on human height variation. *Biological Reviews*. DOI: 10.1111/brv.12165

Stulp, G., Buunk, A. P., Kurzban, R., & Verhulst, S. (2013). The height of choosiness: Mutual mate choice for stature results in sub-optimal pair formation for both sexes. *Animal Behaviour*, *86*, 37–46.

Stulp, G., Buunk, A. P., & Pollet, T. V. (2013). Women want taller men more than men want shorter women. *Personality and Individual Differences*, *54*, 877–883.

Stulp, G., Buunk, A. P., Verhulst, S., & Pollet, T. V. (2013). Tall claims? Sense and nonsense about the importance of height of US presidents. *The Leadership Quarterly*, *24*, 159–171.

Stulp, G., Buunk, A. P., Verhulst, S., & Pollet, T. V. (2015). Human height is positively related to interpersonal dominance in dyadic interactions. *PLoS ONE*, *10*, e0117860.

Stulp, G., Mills, M., Pollet, T. V., & Barrett, L. (2014). Non-linear associations between stature and mate choice characteristics for American men and their spouses. *American Journal of Human Biology*, *26*, 530–537.

Stulp, G., Pollet, T. V., Verhulst, S., & Buunk, A. P. (2012). A curvilinear effect of height on reproductive success in human males. *Behavioral Ecology and Sociobiology*, *66*, 375–384.

Stulp, G., Verhulst, S., Pollet, T. V., & Buunk, A. P. (2012). The effect of female height on reproductive success is negative in western populations, but more variable in non-western populations. *American Journal of Human Biology*, *24*, 486–494.

Swami, V., Frederick, D. A., Aavik, T., Alcalay, L., Allik, J., Anderson, D., . . . Zivcic-Becirevic, I. (2010). The attractive female body weight and female body dissatisfaction in 26 countries across 10 world regions: Results of the International Body Project I. *Personality and Social Psychology Bulletin*, *36*, 309–325.

Swami, V., Furnham, A., Balakumar, N., Williams, C., Canaway, K., & Stanistreet, D. (2008). Factors influencing preferences for height: A replication and extension. *Personality and Individual Differences*, *45*, 395–400.

Swami, V., & Tovee, M. J. (2005). Female physical attractiveness in Britain and Malaysia: A cross-cultural study. *Body Image*, *2*, 115–128.

Tovée, M. J., Reinhardt, S., Emery, J. L., & Cornelissen, P. L. (1998). Optimum body-mass index and maximum sexual attractiveness. *The Lancet*, *352*, 548.

Trivers, R. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man* (pp. 136–179). Chicago, IL: Aldine-Atherton.

U.S. Census Bureau. (2012). *Digital nation: Expanding internet usage*. Retrieved from http://www.ntia.doc.gov/files/ntia/publications/ntia_internet_use_report_february_2011.pdf

Weeden, J., & Sabini, J. (2007). Subjective and objective measures of attractiveness and their relation to sexual behavior and sexual attitudes in university students. *Archives of Sexual Behavior*, *36*, 79–88.

Yancey, G., & Emerson, M. O. (2014). Does height matter? An examination of height preferences in romantic coupling. *Journal of Family Issues*, *35*, 1–21.