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Female choice in the evolution of language:  
Evidence from an analogue study of  
sperm donor preferences

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**Abstract**

This paper presents evidence that female choice could have contributed to the rapid evolution of human language. Sexual selection has driven rapid evolution of sometimes extravagant traits, including the peacocks tail. It argues for a contribution of sexual selection, specifically female choice, to the rapid evolution of human language. Language may influence mating in two ways: As Pinker (1994) suggests, it can be a tool of seduction; more importantly, we think, it can be involved in sexual selection.

When selecting mates females throughout the animal kingdom use physical appearance and prowess as an cue to a male's genetic quality. It well known that women find handsome and athletic men attractive. What isn't as widely known is that intelligence is ranked even higher than looks. Language indexes potential mates' intelligence. With relatively few reproductive opportunities, females should be even more concerned with genetic quality than are males. However, in many modern societies male monopolization of resources may force choosing for wealth, accounting for some of Buss' (e.g., 1989, 1994; Buss & Schmitt, 1993; Buss et al, 1990) findings.

We gave women descriptions of four men -- described as either high on physical attractiveness and athleticism or high on verbal intelligence -- and asked them to suppose they wanted a baby and needed to choose a sperm donor; they responded to all donor pairs. This procedure removes the factor of resources, allowing choices more related to fitness. Women overwhelmingly chose verbal over handsome, athletic men. Similar findings occurred with men and analogous scenarios. Additional findings illuminate the small gender differences in evaluating attributes important in a potential donor, in the context of mate selection research and

theory. This study suggests that female choice may have contributed to rapid selection of language ability.

**KEY WORDS:** Mate selection strategies; Evolution of language; Sex differences; Evolutionary Psychology; Artificial Insemination by Donor

“It wasn’t your face  
 So much as it was your words.”  
 Lucinda Williams (1992)

## 1. Introduction

This paper argues for the contribution of sexual selection, specifically female choice, to the rapidity of human language’s evolution. An enduring mystery for linguists and evolutionary biologists is the selection pressure that could have resulted in human’s rapid increase in language ability. Over the last two million years the size of the human brain increased three fold, a very expensive and potentially dangerous trend because the large-headed babies could get fatally stuck in the mother's birth canal, driving (again via selection pressure) birth at greater and greater prematurity. What processes could lead to these trends?

The forces involved have mystified many, including Noam Chomsky, who commented, “...it is not easy even to imagine a course of selection that might have given rise to [language]” (1972). There has been a good deal of speculation regarding possible mechanisms; candidates have included language's usefulness in hunting (Harnad, Steklis, & Lancaster, 1976), communal rituals (Knight, 1990), and gossip and the servicing of alliances (Dunbar, 1996).

Notably less prevalent have been explanations invoking sexual selection, and, more particularly, female choice, although this case has been made recently by Geoffrey Miller (2000a, 2000b, 2001), as well as by Burling (1986), Locke (1998), and Desalles (1998). Miller focuses on language as a marker of social status and component of dyadic display. Burling (1986) argues that language’s utility has been in the social, rather than the technical, arena. He notes that leaders tend to be recognized for language skills, and that leaders -- presumably male - - raise more children. Locke (1998) ties what he calls “verbal plumage” to social rank and increased fitness. And, finally, Desalles (1998) proposes that, while the use of *relevant* speech may appear to be altruistic and hence initially more beneficial to the hearer rather than the speaker, speech may actually be traded for status.<sup>1</sup>

Female animals from insects to humans have been shown to assess males and choose to mate on the basis of characteristics likely to contribute to the propagation of their own DNA.

Like artificial selection, sexual selection can result in rapid change in a specified trait. The fact that females are highly motivated and skillfully equipped to choose the best mate for their eggs has led us to propose that female choice, acting like artificial selection, contributed to the speed of the evolution of human language (Guisinger & Schuldberg, 1998).

Darwin (1871) himself recognized the potential of such mechanisms to contribute to rapid evolutionary change. Until recently subsequent evolutionists have mainly downplayed or dismissed female choice (for a review see Cronin, 1992). Evolutionary geneticist R. A. Fisher was an exception. Discussing the evolution of sexually selected traits such as the peacock's tail, he wrote, "The two characteristics affected by such a process, namely plumage development in the male and sexual preference in the female, must thus advance together, and so long as the process is unchecked by severe counter-selection, will advance with ever-increasing speed" (1930).

If early hominid females found proto-language and proto-conversation to be "desirable" characteristics and thus subject to the mechanisms of sexual selection, then -- in true peacock's tail fashion -- verbal facility could have evolved relatively quickly under these pressures. As Miller (2000a, 2000b, 2001) does, we suspect that language ability might have been used by females to index intelligence. IQ testers find that Vocabulary is the WAIS-III subtest most highly correlated with general intelligence, and present day women (and men) worldwide rank intelligence second (after "kind and understanding" ) out of thirteen desirable characteristics when choosing a mate (Buss, 1994; Buss et al, 1990). The issue of rating or ranking desirable attributes is taken up later in this article.

While sexual selection pressure in a strictly monogamous species will not be as powerful as in polygamous ones, anatomical (Short, 1979) and anthropological (Ridley, 1993) evidence suggest that humans are not and never have been strictly monogamous. For example, a paternity study of a British neighborhood found that over 20% of children were not genetically related to their ostensible father (Baker, 1996). Perhaps relevant for humans, supposedly monogamous

female birds have been shown to be unfaithful with males of higher “quality” than their mate (Moller, 1988).

In humans it seems highly likely that language is involved both in mate selection and in the process of so-called opportunistic copulation in at least two ways: Perhaps as a tool of seduction, as Pinker (1994) suggests, where men “talk their way in,” but more often as a behavior demonstrating the seducer's intelligence or “quality,” a fitness indicator as suggested by Miller (2000a, 2000b, 2001). (Miller does view language both as a component of courtship and as an indicator of general intelligence.) If adulterous as well as unmated females have historically chosen disproportionately from the ranks of more articulate males, female choice could have been a factor contributing to the rapid evolution of human language.

Previous research on female choice has asked women to choose characteristics they desire in a mate. Buss' (e.g., 1984, 1989; Buss & Schmitt, 1993; Buss et al, 1990) research has been widely cited, especially the finding that women seek males with resources while men seek youth and beauty. These effects are, however, controversial, and have been questioned in research by Townsend (1989), which has in turn been criticized by Angier (1999) and contradicted by Cashdan (1997). Critics have raised questions about extending these findings from modern societies to early humans. Because females have relatively few opportunities to reproduce, they should be even more concerned with partners' genetic quality than are males. However, in many modern patriarchal societies males monopolize resources to an extent not possible in early human societies, forcing women to select mates based on material wealth (see Hrdy, 1997). We believe that the effects of patriarchy and male domination of resources have clouded research on female's mate selection, leading to an artefactual over-valuing of males' resources over other male qualities.

### *1.1 Strategies for studying mate choice: The sperm donor paradigm*

The sperm donor methodology used in this study has the advantage of at least partially eliminating resources as a factor in mate choice. Some findings regarding valuing of resources

may reflect the essentially coercive force of modern political systems on female choice. By asking the young women participants to choose a sperm donor, we remove the concern with resources and allow them to make choices more in line with concern for the fitness of their progeny. However, mate choice schemas in which “earning power” is believed to be heritable might cloud this issue (Scheib, 1994).

This study utilizes a variation on two common research strategies for studying mate choice: Asking subjects to consider various scenarios or descriptions of a potential mate, and asking subjects about their valuing of certain attributes. Typically such research has queried subjects about either a potential spouse or a more casual sexual partner (the “one night stand” methodology). Kenrick, Sadalla, Groth, and Trost (1990) assessed preferences at four levels of commitment: Someone the subject would have sexual relations with, dating, steady dating partner, and marriage partner.

The current study asks both men and women about their preferences for a potential sperm donor for child they will raise. As noted, this may control confounding factors that are present in much mate selection research. We believe that the sperm donor method is superior to the “one night stand” scenarios because the focus in donor insemination is indeed on reproduction, as it is more unlikely to be in modern extra-pair copulations (see also Scheib, 1994, 1997), although some (Scheib, 2001) see a different function for infidelity. In the case of the male respondents, the vignettes separate paternal investment in parenting and partnering from their potential investment in their own offspring.

### *1.11 Actual preferences in sperm donors*

Unfortunately for the purposes of this study, people seeking sperm have not been asked to rank donor characteristics in terms of importance. People often know that the donor is a medical student or graduate student and so they are likely to focus on other issues of similarity of physical attributes and ethnic background, occupation, and blood type. Research using the Buss paradigm or ours has not been done. When actual users of Donor Insemination are surveyed,

many report desiring some donor information (Wendland, Byrn, & Hill, 1996), in conflict with the secrecy that often surrounds both identity and other information about donors (Achilles, 1992; Adair & Purdie, 1996; Mattes, 1994). Recipients most commonly want to know about genetic and medical background (Brewaeys, Ponjaert-Kristoffeen, Van Steirteghem, & Devroey, 1993; Brewaeys, Golombok, Naaktgeboren, de Bruyn, & van Hall, 1997; Clayton & Kovacs, 1980; Klock, & Maier, 1991; Klock, Jacob, & Maier, 1994; Scheib, 2000) and resemblance in physical and personality characteristics (Scheib, 2000). Shapiro, Saphire, & Stone (1990) note that medical practitioners themselves may attempt to match donor and recipient characteristics.

Subjects surveyed by Adair and Purdie (1996) also wanted to know about a donor's background, and they placed importance on the genetic similarity of donors who were relatives of one of the partners. Recipients may also value knowing about the personality of a personally-known donor. Klock & Maier (1991) found women more concerned about physical resemblance and men more concerned about personality similarities, and Klock, Jacob, and Maier (1996) found appearance, personality, medical history, intelligence, and family medical history rated as most important by single women, with donor medical history, appearance, personality, family medical history, ethnicity, and intelligence rated by married recipients. Leiblum, Palmer, and Spector (1995) observed that ethnicity, education, and height were important in a sample of non-traditional mothers, with years of college topping the list. Their respondents also mentioned other physical characteristics, occupation, special interests, religion, and blood type.

Purdie, Peek, Irwin, Ellis, Graham, & Fisher (1992) found that recipients wanted information about donors' interests and favored data on sports, physical attributes, occupation, family background, medical history, education and intelligence, personality, and reasons for donating, with several other types of information mentioned in less than 10% of respondents.



Clayton and Kovacs (1980) discovered couples were anxious about donor physical characteristics, blood group, intelligence, race, social background, possible congenital abnormalities, and, finally, religion (noted by only one couple in their sample of 200).

Scheib, Riordan, and Shaver (2000), studying a sample of women using The Sperm Bank of California, found that physical attributes, personality characteristics, health, similarity to the partner, the impression of a written description of the donor, as well as whether the donor was willing to have his identity released, were all perceived as selection criteria. These researchers discovered that recipients' *actual* choices appeared to be influenced by whether or not the donor released his identity, as well as by height; ethnicity was included as a control variable in this statistical analysis.

#### *1.12 Previous research with an analogue sperm donor paradigm*

Scheib and colleagues (Scheib, 1994, Scheib et al, 1997) also stress the relevance of the sperm-donor paradigm to studying female choice in mate selection. Several studies examined both analogue and, as noted above, actual sperm recipients' desire for and valuing of donor information of various kinds, including character, health, physical attributes, and abilities (including intelligence). Specifically verbal ability was not examined.

In three separate samples, character, health, and abilities were valued over physical attributes in both a donor and a potential mate. One study also examined choices for "extra-pair partners" (similar to the "one night stand paradigm," except that in this "affair" scenario, one partner already has a primary mate) with similar results (Scheib, Kristiansen, & Wara, 1997). Scheib (1994) has also found recipients believe that both character and "resource potential" have low heritability, yet both are moderately (resources) to highly (character) valued in a donor.

Actually the behavioral genetics research suggests that character is quite heritable, especially traits of conscientiousness and sociopathy.

The fact that resource potential is viewed as heritable *at all* does raise some questions regarding the current study's assertion that the donor paradigm can eliminate the effects of male monopolization of resources on the mate selection process. Beliefs about heritability of wealth may make it difficult to remove the effects of resources even in the sperm donor paradigm. Scheib believes that recipients are partially influenced by a long-term "mate choice psychology" schema or module when making choices of a donor. A similar point is made by Boster (2000) regarding mate selection in general and by de Sousa Campos, Otta, et al (2002) about responses to personal ads. There is no question that recipients of donated, anonymous sperm may engage in a great deal of cognitive and emotional activity, indeed fantasy, regarding potential and actual donors (Ehrensaft, 2000). Glass, 2001).

### *1.2 The current research*

The study reported here was primarily designed to ascertain the relative value of male articulateness on sperm donor selection. It also reports data on *males'* preferences for a sperm donor for a child with their wife, and examines gender differences in preference for attributes in a donor for one's child (or, in the case of males, the child of one's partner).

## **2 Methods**

### *2.1 Subjects*

The combined sample consists of 394 subjects, 187 females (mean age 20.6,  $SD = 3.5$ ) and 207 males (mean age 21.2,  $SD = 5.7$ ), assessed in three waves.

**Sample 1.** Data were gathered from 34 female subjects; 28 listed themselves as Caucasian, with one subject listing her ethnicity as Asian, Hispanic, and Native American and 4

listing no ethnicity.<sup>2</sup> Average age was 22.4 ( $SD = 2.87$ ) years. This sample also included 12 male subjects, average age 28.6 ( $SD = 7.0$ ), 11 Caucasian, and one listing no ethnicity.

**Sample 2.** The second sample included 23 female subjects, mean age 19.6 ( $SD = 2.3$ ) and 23 male subjects, mean age 20.5 ( $SD = 3.4$ ) One male subject was dropped who didn't fill out the scenario portion of the questionnaire. Ethnicity was not assessed for participants in the second and third samples.

**Sample 3.** This included 303 participants, 130 females with a mean age of 20.3 ( $SD = 3.7$ ) and 173 males with a mean age of 20.6 ( $SD = 5.5$ ).

## 2.2 Materials

The subjects were given descriptions of four men, each described as either high on verbal ability and moderate on physical attractiveness, or conversely moderate on verbal ability and high on physical attractiveness (See Table 1). The female respondents were asked to suppose that they wanted to have a baby and needed to choose a sperm donor, and the scenarios included that they would never meet the donor. Subjects responded to six forced-choice items asking them to choose between all possible pairs of donors.<sup>3</sup> Men were asked to imagine that they themselves were infertile and wished to select a sperm donor for their partner,.

The vignettes were revised slightly for Sample 2 and again for Sample 3 in order to make the “nuisance comparisons” (i.e., between two hypothetical donors both high on Verbal ability/intelligence or both high on Attractiveness/athleticism) more similar. For sample three, we also modified the vignette for the male participants to include the fact that in the vignettes' situation the subject was *married* and choosing a donor for a child he and his wife would have.

### 2.2.1 Rankings of desirable attributes in a sperm donor

In the second and third samples we also examined rankings of thirteen donor attributes; these utilized the same items used by Buss (Buss et al, 1990). The order of these mean rankings for men and women are presented, and differences between men's and women's preferences are

examined. In the event of tied ranks (two or more attributes given the same ranking), the subject's ranking data were dropped.<sup>4</sup>

### 2.22 Ratings of donor attributes

In Study 3 only subjects were also given the eighteen Buss (1989; Buss et al, 1990) Likert items. Mean ratings are presented for men and women, and gender differences examined.

## 3. Results

### 3.1 Scenarios in the vignettes

In the absence of a preference for one or the other of the contrasted attributes, it is expected that subjects would, as a group, choose each member of a pair of donors equally often. The *Chi-square* statistic is used to assess the extent to which selection of one hypothetical donor or the other differed from the expected 50%. Overall comparisons across four scenarios were assessed using the Wilcoxon Matched-Pairs Signed Ranks Test (Siegel, 1956), which provides a non-parametric test similar to the paired-sample *t*-test.

In each case where the hypothetical choice involved verbal ability or intelligence vs. physical attractiveness, subjects chose donors with higher verbal ability significantly more often than the physically attractive ones. Because results were overwhelmingly consistent across all three studies, we report on the pooled results, except when dealing with the “nuisance” comparisons in pairs of similar vignettes.

Overall, for both genders, verbal ability or intelligence was picked ~~1,122~~ 1,072 [why different?] times over physical attractiveness, chosen 492 times. On the overall test across the four relevant comparisons and both male and female participants considered together, Verbal ability/intelligence was chosen more than Athleticism/Looks 243 times, the reverse only 72 times, with 79 ties (Wilcoxon test;  $Z = 9.48, p < 0.0005$ ).

When the overall preferences were compared for the females in the three samples, Verbal ability was chosen 550 times and Attractiveness 191 (See Table 2). Intelligence was chosen more

often by 131 women, Attractiveness more often by 24, with 32 ties (Wilcoxon  $Z = 8.43$ ,  $p < .00005$ ).

Data from the 207 males in the combined samples indicate that men decide similarly to women if faced with choosing a sperm donor (other than themselves) for their partner (See Table 3). As with the women, men chose Intelligence/Verbal ability in each pairing of contrasting vignettes a total of 522 times, compared with 301 times for Attractiveness/Athleticism. When the overall preferences were tested using the Wilcoxon test, Verbal ability was chosen more often by 112 men, Attractiveness more often by 48, with 47 ties ( $Z = 5.06$ ,  $p < .00005$ ). The preferences were somewhat stronger for females, compared to the males.

### 3.2 Nuisance comparisons within conditions

Two nuisance comparisons paired attractive with attractive or articulate with articulate donors. These are important, as they give an idea of the extent to which the vignettes are tapping into the qualities of interest and controlling other extraneous factors that might contribute to choices. These results suggested continued improvements in the constructions of the vignettes.

In Sample 1, for comparison 3, the combined subjects' choices were 34 and 12 (*chi-square* [1] = 10.52,  $p = 0.001$ ); for comparison 4, the choices were 31 and 15 (*chi-square* [1] = 5.57,  $p = 0.018$ ).<sup>5</sup> Subjects appeared to favor education in these otherwise matched choices. These results indicated that future vignettes be constructed to control a number of additional factors. Modifications were made for Sample 2 and Sample 3, with an attempt to make the vignettes more equivalent; they were shortened, some information removed, and matched the paragraphs more closely on length.

In Sample 2, with revised vignettes, the first nuisance comparison (Comparison 3) was non-significant (Comparison 3, choices of 25 and 20; *chi-square* [1] = 0.56,  $p = 0.53$ ). However, there was still a difference in comparison 4 (choices of 30 and 15; *chi-square* [1] = 5.00,  $p = 0.025$ ), with subjects preferring the longer vignette with the mention of graduate school.

Finally, when the vignettes were modified further for Sample 3, Comparison 3 resulted in choices of 138 and 162 (*chi-square* [1] = 1.92,  $p = 0.17$ , favoring Vignette 4 over vignette 1), and comparison 4 resulted in Choices of 126 and 174, still a significant difference (*chi-square* [1] = 7.68,  $p = 0.006$ , favoring vignette 3 over vignette 2).

In hindsight it appears that, despite two rounds of modifications of the vignettes, donor #3 was presented with more educational potential (he is going to graduate school) and as *somewhat* athletic, in comparison to #2 who is also presented as less good looking.

### *3.3 Gender differences in preferences for attributes in a sperm donor*

#### *3.3 Desirable attributes*

##### *3.3.1 Rankings of desirable attributes in a sperm donor*

The non-parametric Mann-Whitney  $U$  test was used to evaluate sex differences in rankings of attributes; this is a non-parametric test generally believed to have good statistical power in small samples (Siegel, 1956).

For women ( $n = 140$ ), the 13 donor attributes were ranked, from most to least desirable, in this order: 1) Healthy, 2) Intelligent, 3) Kind and understanding, 4) Good heredity, 5) Exciting Personality, 6) Creative and Artistic, 7) Physically attractive, 8) Easygoing, 9) College Grad, 10) Good earning capacity, 11) Wants children, 12) Religious, and 13) Good Housekeeper (See Table 4).

For men ( $n = 185$ ), the rankings were quite similar: 1) Healthy, 2) Intelligent, 3) Kind and understanding, 4) Creative and Artistic, 5) Physically attractive, 6) Exciting Personality, 7) Good heredity, 8) Easygoing, 9) College Grad, 10) Wants children, 11) Good earning capacity, 12) Religious, 13) Good Housekeeper.

The only significant gender differences were for Religious (Women's mean rank, 10.01, men's mean 10.55; Mann-Whitney  $U = 11207.5$ ,  $Z = 2.13$ ,  $p = 0.033$ ) and Physically attractive

(Women's mean rank, 6.69, men's mean: 6.09; Mann-Whitney  $U = 11285.0$ ,  $Z = 2.00$ ,  $p = 0.046$ ). What is noteworthy here is the relatively low ranking for attractiveness by the men and the women, as well as the similarities across genders. However, the gender difference for Attractive is in part consistent with Buss's (e.g., 1994) findings for mate choice in general, although what is being rated here by both men and women is the attractiveness of a *male* potential donor, not a female partner. (See Discussion.)

### 3.32 Ratings of desirable attributes

Eighteen attributes were rated on 4-point Likert scales ranging from 0, "irrelevant or unimportant," to 3, "indispensable." Gender differences in these *ratings* were evaluated by *t*-tests. Because there are eighteen separate comparisons, the possibility of spurious findings needs to be considered. No correction or adjustment of the *alpha* level was undertaken here.

There were three significant gender differences in the ratings of attributes noted as important in a prospective donor (See Table 5). Women rated Emotional stability and maturity and Similar religious background slightly but significantly higher than the men. Men rated Similar ethnic background slightly higher than the women. There was no difference on "Good financial prospect," indicating that the sperm-donor vignettes successfully removed the issue of access to resources.

And, men rated Good looks of the donor (Mean rating 1.89,  $SD = 0.72$ ) as more important than the women did (Mean rating 1.64,  $SD = 0.65$ ). This represent an effect size of 0.37, a "small" effect (Cohen, 1988) and considerably smaller than the effect size in Buss (1989) Mainland US sample.<sup>6</sup> This difference, although small in magnitude, is highly statistically significant ( $t [298] = 3.14$ ,  $p = 0.002$ ). These findings are consistent with reports of males'

valuing of attractiveness across cultures, although, again, the attractiveness here is that of a male donor. This issue will be discussed below.

#### 4 Discussion

The information from these comparisons based on “head to head” forced choice data from vignettes, and on rankings and ratings of attributes, provides evidence that female choice could have been a factor in language evolution. Because it correlates highly with genetic health, “attractiveness” as manifested by physical symmetry and vigor is valued in creatures from arthropods to humans (Grammer & Thornhill, 1994). By forcing subjects to choose between potential sperm donors who were either very attractive or very articulate we were able to assess the relative value of these characteristics .

As we know from selective breeding of plants and animals, change in an inherited trait can occur quickly if individuals are selected to breed based on that trait. While being more smooth-tongued probably gave a subtle advantage to actual survival, succeeding in the marriage market and with other men's wives could have led to rapid change in the gene pool -- if there were genetic variation in articulateness, and if females valued verbal ability in their mates. We have ample evidence, from behavioral genetics, of genetic variation in articulateness. This research indicates that women today value verbal ability and intelligence even more highly than good looks in choosing a genetic father for their child.

We did find some support for Buss' (1994) contentions regarding selected preferences in attributes. The emergence of a difference between men and women in the importance of attractiveness in a male donor who will be the man's surrogate, and the female's reproductive partner is interesting; this perhaps suggests the operation of *very* generalized mate-choice schemas (Boster, 199, 2000; Scheib, []; others) in men. Internal mate-selection schemas do seem to be at work in preferences for variables such as Similar religious background, which is unlikely to be inherited, although it may also be a placeholder for ethnicity. Alternatively, men may care less about the fitness of the child of a sperm donor, even though they would invest in this child;



this too could account for a relative lack of gender differences in the valuing of donor attributes. Miller (2000), however, suggests that both women as well as men value verbal facility; this contention is supported by this research.

However, as with much of the work on gender differences (See Boster, 1999, 2000), similarities in values may outweigh differences. When subjects were put in an admittedly imaginary but – we would argue – more behavioral choice situation, Verbal Ability/Intelligence trumped attractiveness. It would be interesting to see if a similar mate choice vignette methodology showed similar results for other pairs of attributes. We are planning a parallel examination of preferences in egg donors, and we would like to include contrasts based on wealth in a new set of vignettes in order to address more directly issues involving resources.

Finally, the observed lack in others' research of gender differences in preferences for Earning capacity in a potential sperm donor does suggest that some widely reported gender differences in mate preferences may be artifacts of patriarchy; when a reproductive partner's control of resources is irrelevant, as it is in this study, some of these differences may disappear.

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**Table 1. The vignettes (Final Sample 3 versions)****Attractiveness/Athleticism:**

#1 is college sophomore at [a two-year college] majoring in physical education. He is incredibly handsome with a gorgeous build and was all-state in basketball. He went to a small-town high school and scored 400 on the Verbal SAT.

#4 is a full-time white water guide. In the winters he guides in the Grand Canyon and returns to Montana for the summers. He is 20, tall, muscular and very handsome, but he isn't much of a conversationalist.

**Verbal ability/intelligence:**

#2 is a sophomore at [the subjects' own university] majoring in psychology. He is of average build and not particularly athletic or handsome but he is intellectually gifted and scored 800 on the SAT in verbal ability.

#3 is a sophomore at [the rival four-year college] and plans to go to grad school. He won honors as a top debater. He is of average height, weight, and looks. He participated in high school tennis but did not distinguish himself athletically.

**Table 2. Females' choices for sperm donors.**

<b>Pair</b>	<b>Choosing Intelligence/ Verbal</b>	<b>Choosing Physical Attractiveness/ Athleticism</b>	<b><i>Chi-square</i></b>	<b>Sig.</b>
1 ([A vs. V])	132	54	32.71	< 0.00005
2 ([A vs. V])	152	33	76.55	< 0.00005
5 ([V vs. A])	126	59	24.27	< 0.00005
6 ([V vs. A])	140	45	48.78	< 0.00005
<b>Total</b>	550	191	--	--

**Note:***DF* = 1

**Table 3. Males' choices for sperm donors.**

<b>Pair</b>	<b>Choosing Intelligence/ Verbal</b>	<b>Choosing Physical Attractiveness / Athleticism</b>	<i>Chi-square</i>	<b>Sig.</b>
1 ([A vs. V])	132	74	16.33	< 0.00005
2 ([A vs. V])	138	67	24.59	< 0.00005
5 ([V vs. A])	129	77	13.13	< 0.00005
6 ([V vs. A])	123	83	7.77	0.005
<b>Total</b>	522	301	--	--

**Note:***DF* = 1

**Table 4. Gender differences in rankings of desirable attributes in a sperm donor.**

<b>Attribute</b>	<b>Mean Ranking: Men</b>	<b>Mean Ranking: Women</b>	<b>Z</b>
Kind and understanding	5.07	4.71	
Religious	10.55	10.01	2.13*
Exciting Personality	6.17	6.04	
Creative and Artistic	5.65	6.33	
Good Housekeeper	11.53	11.06	
Intelligent	2.93	3.43	
Good earning capacity	10.16	9.54	
Wants children	9.99	9.68	
Easygoing	6.64	7.02	
Good heredity	6.22	5.82	
College gradate	7.54	7.71	
Physically attractive	6.09	6.69	2.00*
Healthy	2.50	2.97	

\*  $p \leq 0.05$

**Note:**

Mean rankings (1 = high, 13 = low) are reported here; note that the Mann-Whitney U test is nonparametric and that the reporting of means for ranking data is somewhat questionable.  $n = 140$  females, 185 males.

**Table 5. Gender differences in ratings of a potential sperm donor**

<b>Number</b>	<b>Item</b>	<b>Male Mean (SD)</b>	<b>Female Mean (SD)</b>	<b><i>t</i></b>	<b><i>df</i></b>
Rate1	Good cook and housekeeper	.85 (.71)	.87 (.75)	.16	299
Rate2	Pleasing disposition	2.19 (.70)	2.32 (.69)	1.68	297
Rate3	Sociability	2.24 (.74)	2.24 (.63)	.02	299
Rate4	Similar educational background	1.73 (.96)	1.64 (.96)	.75	299
Rate5	Refinement, neatness	1.40 (.86)	1.43 (.85)	.25	299
Rate6	Good financial prospect	1.33 (.95)	1.31 (1.00)	.14	299
Rate7	Chastity	.99 (1.10)	.82 (1.07)	1.36	298
Rate8	Dependable character	2.41 (.78)	2.53 (.56)	1.59	299
Rate9	Emotional stability & maturity	2.58 (.63)	2.75 (.48)	2.56*	299
Rate10	Desire for home and children	1.51 (1.04)	1.50 (1.15)	.04	298
Rate11	Favorable social status	1.25 (.95)	1.08 (.91)	1.53	298
Rate12	Good looks	1.89 (.72)	1.64 (.65)	3.14****	298
Rate13	Similar religious	.70	.95	2.14*	298

	background	(.99)	(1.09)		
Rate14	Ambition & industriousness	2.01 (.75)	2.14 (.68)	1.51	297
Rate15	Similar political background	.42 (.74)	.52 (.76)	1.10	297
Rate16	Good health	2.82 (.46)	2.74 (.49)	1.49	298
Rate17	Education and intelligence	2.51 (.66)	2.52 (.57)	.15	298
	Similar ethnic background	1.54 (1.11)	1.22 (1.07)	2.43*	298

**Note:**

Ratings can range from 0 (“irrelevant or unimportant”) to 3 “indispensable.”

- \*  $p \leq .05$
- \*\*  $p \leq .05$
- \*\*\*  $p \leq .005$

## Appendix 1: Vignettes used with the first two samples

### *Sample 1:*

#### **Attractiveness/Athleticism:**

#1 is a college sophomore at [a two-year college] majoring in physical education. He is incredibly handsome with a gorgeous build and was all-state in basketball. He went to a small-town high school graduating with a 2.4 GPA.

#4 is a full-time white water guide. In the winters he guides in the Grand Canyon and returns to Montana for the summers. He is 20, tall, muscular, and so handsome that, although he isn't much of a conversationalist, women often request his trips. His grades were not high enough to encourage him to go to the University right away, but he plans to go to a community college in a few years.

#### **Verbal ability/intelligence:**

#2 is a sophomore at The University of Montana majoring in psychology. He is of average build and not particularly athletic or handsome but he is intellectually gifted and scored 800 on the SAT in verbal ability.

#3 is a sophomore pre-med student at [the rival four-year college] and plans to become a pediatrician. He won top honors as a debater in high school. Physically he is of average height, weight, and looks. In high school he also participated in tennis and skiing but did not distinguish himself athletically.

**Sample 2:****Attractiveness/Athleticism:**

#1 is a college sophomore at [a two-year college] majoring in physical education. He is incredibly handsome with a gorgeous build and was all-state in basketball. He went to a small-town high school and scored 400 Verbal on the SAT.

#4 is a full-time white water guide. In the winters he guides in the Grand Canyon and returns to Montana for the summers. He is 20, tall, muscular, and so handsome that, although he isn't much of a conversationalist, women often request his trips.

**Verbal ability/intelligence:**

#2 is a sophomore at [the subjects' own university] majoring in psychology. He is of average build and not particularly athletic or handsome but he is intellectually gifted and scored 800 on the SAT in verbal ability.

#3 is a sophomore at [the rival four-year college] and plans to go to graduate school. He won top honors as a debater in high school. Physically he is of average height, weight, and looks. In high school he also participated in tennis and skiing but did not distinguish himself athletically.

**Note:**

Underlining indicates wording changed or eliminated in the next version of the vignettes.



## Notes

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<sup>1</sup> A similar point has been made by Bickerton (Wade, 2003).

<sup>2</sup> Subjects could mark more than one ethnicity.

<sup>3</sup> The vignettes were given in the following order: Attractive (A), Verbal (V), Verbal, Attractive.

The comparisons were presented in the following order: 1) A vs. V; 2) A vs. V; 3) A vs. A; 4) V vs. V.; 5) V vs. A.; 6) V vs. A.

<sup>4</sup> This occurred with 20 participants. Data with missing ranks were included.

<sup>5</sup> Comparison 3: Vignette 1 over vignette 4. Comparison 4: Vignette 3 over vignette 2.

<sup>6</sup> Pooled  $SD = .70$ , Difference =  $1.89 - 1.64$ . Effect size =  $0.37$ .