

Female Choice in the Context of Donor Insemination

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Female mate choice began to receive extensive scientific attention with the emergence of sociobiology, even though the study of animal behaviour had existed for centuries. Evolution-minded research on female choice thrived because of Trivers's (1972) focus on the role of parental investment in mate choice, and perhaps, too, because of a changing culture that included the feminist revolution (for reviews see Andersson, 1994; Batten, 1992; Buss, 1994; Cronin, 1991).

A Darwinian analysis of adaptive problems, such as choosing the "optimal" mate, entails the characterization of contingent responsiveness of the female to attributes of males and to other factors such as the female's alternative reproductive options. For example, a female who preferred the attribute of health in a potential mate would outreproduce females who did not have this preference, if healthiness conferred a selective advantage to the young. Over many generations, the preference for cues of health would become a part of the evolved psychology for female mate choice. Those individuals with psychological systems that lead to greater reproductive success will have been favored by natural selection, resulting in a species-typical (sex-typical and life-stage typical) evolved psychology (Ellis, 1992). This focus on the mental processes or mechanisms of behavior, which uses evolutionary biology as the theoretical framework, is called *evolutionary psychology* (e.g., Barkow, Cosmides, and Tooby, 1992). Psychological systems of interest are those that evolved to solve problems consistently encountered in past environments in which selection occurred (see Wilson, Daly, and Scheib, this volume). Mate choice is one of these problems.

Psychology of Female Mate Choice

In many species, especially mammals, investment in offspring is often greater for females than for males. This asymmetry in parental investment and the large po-

tential cost associated with an ill-chosen mate creates a strong selection pressure on females to be discriminating with respect to when and with whom they mate (Daly and Wilson, 1983; Trivers, 1972). Accordingly, in *Homo sapiens*, Symons (1979) proposed that women have a specialized psychology to solve the problem of choosing a mate. A psychology that aided a woman in selectively responding to potential mates with attributes that would increase her reproductive success would be maintained by natural selection. Since women make a large investment in each offspring, and the children benefit from paternal care (Lancaster, 1991), the female sexual psychology is expected to include the preference for a male's ability and willingness to invest in her offspring (Symons, 1979; Trivers, 1972).

Male parental investment includes the allocation of material resources reliably directed at a woman and her offspring. In non-state societies women prefer men who have the most material resources to offer, and generally the women's children are more likely to be healthy and survive better if provided for by fathers with above average resources. Among the Kipsigis of Kenya, who are horticulturalists, men who offered more acres of land per wife were preferred as husbands by women (and their parents, as the Kipsigis practice "arranged" marriages) (Borgerhoff Mulder, 1990). Among the Ache of Paraguay, who until recently were hunter-gatherers, better hunters were more often named as extra-pair lovers and illegitimate fathers than poor hunters. Moreover, children of better hunters were more likely to survive to adulthood than children of poor hunters (Hill and Kaplan, 1988). Among villagers of Grande Anse in Trinidad, many of whom live by fishing and cultivation, women expressed a preference for wealthier males and these males did have greater reproductive success through a greater number of mates (Flinn, 1986). Thus in a variety of traditional societies women exhibit preferences for attributes in mates that are likely to aid them reproductively (for a review, see Betzig, 1988).

In societies such as those of Europe and North America, women also appear to value cues of material and social success in potential husbands (e.g., Buss, 1989; Buss and Barnes, 1986; Landolt, Lalumière, and Quinsey, 1995; Pérusse, 1993; Sadalla, Kenrick, and Vershure, 1987; Townsend 1989), as revealed in data on income, job status, and women's preferences. Women prefer that their spouses be ambitious, career-oriented, and have a good earning capacity (Buss, 1989), and men who meet these criteria tend to have greater mating success than men who do not (Pérusse, 1993). Although women appear to value good economic prospects or material resources of a mate much more than men do in a wife, there are several attributes that both men and women value similarly. In general, both women and men value characteristics in a long-term mate, such as kindness, dependability, and intelligence, which are likely to be indicative of a good companion (Buss and Barnes, 1986). They also prefer that their mates be attractive and that they show fondness for children. These diverse criteria for selecting a long-term mate have been identified in a variety of studies (e.g., Buss, 1989; Buss and Schmitt, 1993; Kenrick, Sadalla, Groth, and Trost, 1990).

Many of these studies utilize research protocols that rely solely on self-report data. While it may be the case that women are correct in identifying the attributes that underlie their mate choices, it is also very plausible that they do not have conscious access to all the factors that influence their particular decisions (Ellis, 1992; Nisbett and Wilson, 1977). Although self-report data may be limited by this, the preferences revealed by this method are often consistent with those from other behavioral measures. For example, Landolt et al. (1995) showed subjects pictures of hypothetical sexual partners and measured preference by time spent viewing the picture, as well as by using self-report; the two methods produced similar results. Moreover, those results were also consistent with previous self-report studies (e.g., Buss and Schmitt, 1993). Additionally, data from nonstate societies, such as Ache women's preference for good hunters as their sexual partners, provide a valuable validity check on mate choice experiments in general and are consistent with North American women's preferences (as reported earlier).

While valuing material and social resources in a mate has obvious benefits for women and their offspring, the utility of physical attractiveness in a mate has not always been clear. Recent Darwinian analyses of physical attractiveness with respect to "fluctuating asymmetry" theory suggest some answers. Bilateral symmetry is thought to be a marker of phenotypic quality as evidenced through developmental stability and parasite resistance (Thornhill and Gangestad, 1993). High phenotypic quality is valuable in a mate, as it can affect both offspring viability and the mate's ability to invest in offspring (Gangestad, 1993). Women would not necessarily report valuing phenotypic quality, but they do report to value one of its markers, attractiveness (e.g., Buss and Barnes, 1986). Gangestad, Thornhill, and Yeo (1994) have found that facial attractiveness in men is indeed predicted by the degree of symmetry in a male's body. Self-reports of valuing attractiveness in sexual partners was quite useful in identifying further directions for mate choice research.

Another context in which to investigate the characteristics of an evolved psychology for female mate choice is in the contemporary practice of donor insemination. Choice of a long-term mate and choice of a sperm donor share important similarities with respect to the man's genetic contribution to offspring. As women's choices in either context will affect offspring condition and future reproductive options, it is likely that women will have some of the same preferences for a donor as they do for a long-term mate. These similarities in preferences can be assumed to reveal some of the basic cues women normally attend to in long-term mate choice. An important benefit of analyzing women's preferences for sperm donors is that a male's genetic impacts on offspring can be isolated and investigated separately from other factors important in mate choice, such as his parental investment and companionship. In addition, a woman's choice of sperm donors is less constrained than in mate choice: What a woman prefers in a sperm donor can be exactly what she gets, whereas in long-term

mateships, the choices of one sex are constrained by the other's preferences and choices.

Donor Insemination

Infertility affects approximately 600,000 Canadians (Royal Commission on New Reproductive Technologies, 1993, p. 188). This represents 8% of heterosexual couples who have lived together for at least one year, do not use any form of birth control, and have not become pregnant. This estimate is very similar to the 7.9% estimate for the United States (Mosher and Pratt, 1990, p. 5). The most common solution for infertile couples is assisted insemination with sperm from a donor (Office of Technology Assessment [OTA], 1988; Stephens, McLean, Achilles, Brunet, and Catano, 1993). In addition to these couples, some women who do not have a male partner, such as single women and lesbian couples use donor insemination (DI). DI is an old technique, dating back to at least 1793, but it has only become widely practiced during the past few decades (Achilles, 1992; Shapiro, Sapphire, and Stone, 1990). It is also potentially the simplest and most effective form of assisted reproduction: A medical practitioner or the recipient's partner places sperm in the upper vagina around the estimated time of ovulation. DI is not a cure for the male's infertility, but a replacement for it, and recipients are clients more than patients. However, the medical establishment refers to recipients as patients and often calls donor insemination ~~by donor~~ "therapeutic donor insemination."

In DI, sperm from an anonymous donor is usually used. Typically, only limited, nonidentifying information about the donor is available to the woman, including the donor's physical characteristics (e.g., hair, eye, and skin color, and height), ethnicity, and some medical and educational background. Often, however, women have no say in the choice of the donor; rather, a physician or nurse makes the choice and usually on the basis of the donor's physical similarity to the woman's partner (OTA, 1988; Stephens et al., 1993). In the case of heterosexual recipient-couples, matching can serve to mask the male's infertility (Daniels and Taylor, 1993) by increasing the probability that a resultant child will resemble him. The child's resemblance may also enhance the man's inclination to accept the child as his own (Scheib and Daly, 1996). Daniels and Taylor (1993) argued that minimal information about donors has become the practice because of the perceived need for secrecy: anonymity for the benefit of the donor and secrecy about the recipient-couple's infertility. Anonymity serves to minimize contact and possible obligations between the donor and recipients (Achilles, 1993), which was thought to be necessary to find men willing to act as donors (Robinson et al., 1991). This practice also has the effect of relieving medical personnel of the task of collecting and providing recipients with extensive information, even though anonymity could still be maintained while making in-

formation available (discussion follows). The need for secrecy, however, is now under question. Recent studies suggest that many donors are willing to remain in programs without the guarantee of anonymity (e.g., Mahlstedt and Probasco, 1991; Purdie et al., 1992), and couples are starting to be more open about using DI (Daniels and Taylor, 1993).

Given the decreased importance of secrecy, it is surprising that women are still not given much control or choice in their DI process. In the cases of single women or lesbian couples who use DI (only about 40% of programs in Canada would consider these women as possible recipients; Stephens et al., 1993), secrecy is often not a concern, as there is no need to hide male infertility, and DI is often preferred to using a known donor with his own set of demands. Women (and men in the case of heterosexual recipient-couples) may very well be interested in a great deal of information about a donor in order to make more informed decisions and be content with them, especially as these decisions have lifelong ramifications of having and raising a child (Brewaeys, Ponjaert-Kristoferson, Van Steirteghem, and Devroeg, 1993; Mahlstedt and Probasco, 1991). Moreover, if women's mate choices affect maternal investment by their impacts on the condition of offspring, and by a sense of having chosen wisely and autonomously, then restricting information and choice about donors may deprive the women of the optimal psychological conditions for the pregnancy and subsequent care of the child.

Perhaps in response to women's demands, some Canadian DI programs are beginning to offer women more choice and are willing to give detailed information about a donor while maintaining his anonymity (e.g., those associated with ReproMed, Ltd.). Many clinics and sperm banks in the United States already do these things (e.g., Mattes, 1994, Appendix A). In these cases, donor information can include religion, occupation, interests, hobbies, special talents, and the donor's stated willingness to release his identity when DI offspring reach eighteen years of age (Achilles, 1992; OTA, 1988). When women express interest, a DI program might also provide detailed descriptions of donors' personalities and medical backgrounds (including family health history), as well as portrait sketches of the donors, while still maintaining their anonymity.

Even though DI programs are increasingly offering women more information about donors, few studies have addressed whether women, in fact, want information about their donors, what they want to know about them, how they would choose them, or what detrimental effects a lack of information may have. The results of Klock and Maier's (1991) study of psychological factors related to DI suggest that heterosexual couples do indeed want information about their donors. In a sample of 35 couples, recipients' were primarily concerned with information about a donor's medical and genetic background, and the future child's physical and personality resemblance to the recipient's partner. Purdie et al. (1992) addressed the question of what recipients wanted to know about their donors: Women and men of 53 heterosexual couples independently listed the most im-

portant things they wanted to know about the donor should a pregnancy result, both for themselves and for potential offspring. Recipients wanted information that would "describe [the donor] as a person" (p. 28), such as his interests, physical attributes, and family background. Medical history was also important, but not the most important consideration, perhaps because medical and genetic screening occurs before men can even become donors.

Only anecdotal information exists on the effects of withholding information about donors. Achilles (1992) and Mattes (1994) noted that a lack of information about the donor can lead to preoccupation and fantasizing about him, perhaps as part of fulfilling a need to make the pregnancy a less anonymous event. Mattes (1994) suggested that recipients often want information about the donor because they are interested in "find[ing] some real and positive connection with the man who is the biological father of [one's] child" (p. 34).

Sperm Donor Selection and the Psychology of Female Mate Choice

In light of the lack of research on how women choose their donors, I initiated a series of questionnaire studies to examine this issue (Scheib, 1994; Scheib, Kristiansen, and Wara, 1996). As choice of donor has the probable result of producing a child, I hypothesized that if women were asked to rate the importance of various attributes in a sperm donor, their decisions could be interpreted in one of two ways: (1) Women value those attributes they believe would affect a resultant child, such as a donor's health or his physical attributes; or (2) women value the same attributes as they do in a long-term "marital" partner, such as traits indicative of a good companion, as well as those valued in the first interpretation. Women's preferences for a donor might be similar to those for a mate, because the sperm of both a donor and a mate have equivalent impacts on offspring. This similarity might therefore elicit some of the same preferences for a donor as identified in studies of mate preferences. I designed three experiments to assess any differences in women's preferences for a mate versus a sperm donor.

In the first experiment using a between-groups design, women rated the importance of various attributes of (1) a hypothetical sperm donor or (2) of a long-term mate (see Scheib, 1994, for details).

Subjects were women between the ages of nineteen and forty-five from undergraduate psychology courses: 60 women rated the importance of attributes in a hypothetical sperm donor, and 59 women rated the importance of same attributes in a hypothetical long-term mate (all their responses were anonymous). A questionnaire, constructed from items from previous mate choice studies (Buss and Barnes, 1986; Buss and Schmitt, 1993) and from items used by physicians and recipients to choose sperm donors (e.g., health-related items and physical attributes), was used to compare women's preferences for long-term mates to those for sperm donors (see Scheib, 1994, for details). Since women might value only

those attributes in a donor that they believed to have a strong genetic component (e.g., physical attributes), subjects' "heritability" beliefs were also assessed. *Heritability* was defined for the purpose of the questionnaire as "biologically inherited, transmitted from parent to child via one's genes." Subjects in the donor condition were also instructed that "the anonymity of [the] donor [was protected] in order to guarantee that he [would] not be contacted by the recipient and/or potential offspring." This is similar to what is done in DI programs, and it made it explicit to subjects that there would be no contact with the donor; that is, they could expect nothing from him.

Women rated their preferences on a large number of attributes, so in order to reduce redundant analyses on attributes that represented similar underlying constructs, a factor analysis was conducted (Tabachnick and Fidell, 1989). With this statistical procedure, the large number of attributes were reduced to four representative factors of character, health, physical attributes, and abilities (see Table 20.1). Analyses were conducted on the composite scores for each factor (derived by averaging ratings across all attributes within each of the four factors).

Health was the most important factor to subjects who rated attributes in a donor (see Fig. 20.1a). This preference was consistent with Klock and Maier's (1991) clinical study in which recipients' concerns included the health status of the donor. Character was the most important factor to subjects who rated attributes in a long-term mate. This was consistent with previous mate choice stud-

Table 20.1 Factors and Their Constituent Attributes that Women Rated for a Sperm Donor, Long-Term Mate or EPC Partner

FACTOR 1: Character	FACTOR 3: Physical
kind	hair color
understanding	handsome
dependable	eye color
considerate	height
affectionate	
honest	FACTOR 4: Abilities
self confident	creative
	musical talent
FACTOR 2: Health	intelligent
family health	
history	
family longevity	
record	
health	
background	

Note: Table 20.1 is adapted and reprinted by permission of the publisher from Sperm Donor Selection and the Psychology of Female Mate Choice by J. E. Scheib, 1994, *Ethology and Sociobiology*, 15, 3, p. 120. Copyright 1994 by Elsevier Science, Inc.

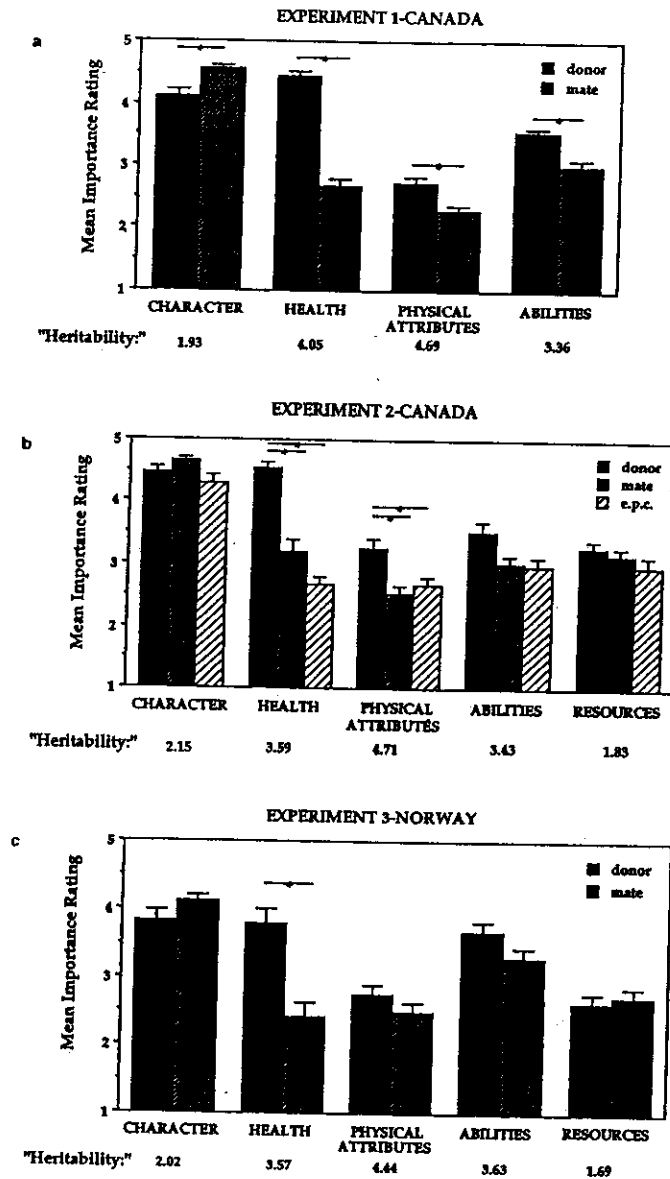


Figure 20.1 Comparison of mean importance ratings for factors in a sperm donor and long-term mate (a) for a sperm donor, long-term mate, and EPC partner; (b) and for a sperm donor and long-term mate in Norway; (c) where indicated, $p < 01$ for differences among groups, where 1 = not important at all, 3 = moderately important; 5 = very important. Error bars indicate SE. Mean "heritability" ratings listed below each factor where 1 = not heritable at all, 3 = moderately heritable, 5 = highly heritable. Note: Figures 20.1(a) and (b) are adapted and reprinted by permission of the publisher from Sperm Donor Selection and the Psychology of Female Mate Choice by J. E. Scheib, *Ethology and Sociobiology*, 15, 3, pp. 121, 124. Copyright 1994 by Elsevier Science Inc.

ies, as attributes that made up this factor were also reported by women as very important in a long-term mate (e.g., Buss and Barnes, 1986; Buss and Schmitt, 1993). Character was also very important in a donor, second only to health. Physical attributes were rated as least important in donors and long-term mates.

Women's preferences for attributes of a donor and a long-term mate were compared: health, physical attributes, and abilities were significantly more important in a donor than in a long-term mate (see Fig. 20.1a), which is a rational outcome, given that subjects also rated health, physical attributes, and abilities as having a moderate to high chance of being "biologically transmitted from parent to child" (see Fig. 20.1a). Women rated character as significantly more important in a long-term mate than in a donor. This is not surprising, as women in the donor condition were told that they would have no contact with the donor, whereas the women in the mate condition would assume that they would have to interact with the long-term mate. The result, which is remarkable, is that character was the second most important factor in a sperm donor after health, despite the fact that character was rated as least likely to be "biologically transmitted" to a resultant child. This apparent logical inconsistency was not the result of women in the sperm donor condition failing to keep the task in mind, since they did rate attributes they believed likely to affect a resultant child as significantly more important than did women in the long-term mate group. That character was considered important in both long-term mate and donor selection suggested that women may have partly relied on the evolved psychology for long-term mate choice when they assessed attributes in a sperm donor, as consistent with the second hypothesized interpretation.

Although preferences for a donor were similar to those for a long-term mate, there were some differences in the two conditions that suggested that preferences for a sperm donor might reflect psychological adaptations to some other naturally occurring context, such as that of an extrapair copulation (EPC). Choice of sperm donor is different from long-term mate choice, in that the male who provides the gametes does not provide any of the paternal investment. Acquiring a donor's gametes is similar to the EPC context in which a woman sometimes receive gametes and nothing more (Smith, 1984). To test whether choice of sperm donor was more similar to choice of extrapair partner than to choice of long-term mate, the second experiment was done (see Scheib, 1994, for details). Using the same design as in the first experiment, a third group of women rated the importance of attributes in an extrapair partner; these preference scores were compared to women's scores for a sperm donor and for a long-term mate. The additional EPC condition would provide a test for the existence of a possibly distinct set of preferences for traits of a sexual partner in the context of an EPC. At present, few studies have been done to investigate the existence of a distinct EPC psychology. EPCs have undoubtedly been a persistent practice of women in evolutionary history (Smith, 1984; Wilson and Daly, 1992). EPCs entail a different set of costs and benefits from long-term mate choice, including the risk of desertion by a

long-term mate, and it is likely that distinct psychological processes were selected to assess the costs and benefits associated with this mating context for women.

The second experiment also provided a further test of the hypothesis that women's preferences for a sperm donor reflect an evolved psychology of mate-choice, as well as providing the opportunity to test the replicability of the first experiment. If subjects in the first experiment who assessed a donor were using some of the psychological assessment mechanisms of evolved criteria for long-term mate choice, then it is expected that the man's resources, which are valued in a mate (e.g., Borgeroff Mulder, 1990; Buss and Barnes, 1986; Townsend, 1989), should be similarly valued when selecting a sperm donor. Thus a number of resource-related items (forming the construct "resource potential") were added to the questionnaire.

Subjects were women between the ages of 20 and 47 years from undergraduate psychology courses: 30 women rated attributes in a donor, 30 rated attributes in a long-term mate, and 28 rated attributes in an extrapair partner. The preference ratings for a donor and a long-term mate and the rank ordering of the "heritability" scores replicated the pattern of results found in the first experiment (see Fig. 20.1b). Health was the most important factor in a sperm donor and significantly more important than in a long-term mate; physical attributes were rated as least important for both a donor and a long-term mate, but were still considered significantly more important in a sperm donor. As in the first experiment, despite women's belief that character had little chance of being "transmitted from parent to child via one's genes," character was again considered very important in a sperm donor, almost as important as in a long-term mate. Women rated resource items considerably less important than health and character in a sperm donor, which attested to subjects' understanding the task of donor selection, in which no resource benefits would be accrued. However, in the mate-choice condition, resources were also rated as less important than character, and no difference emerged between the importance of resource potential in a donor and a long-term mate. So what is remarkable about the sperm donor condition is the very high ratings for the man's character, as in the long-term mate condition, even though character, like resources, was not considered very "heritable."

The preference scores for all of the factors were similar for the long-term mate and EPC conditions (see Fig. 20.1b), and male character was the most important factor. Women's ratings for attributes in a sperm donor were similarly different from both the long-term mate and the EPC conditions: Health and physical attributes were significantly more important in a sperm donor.

Conclusions from this second experiment included the following: (1) There was little evidence of a distinct EPC psychology from a long-term mate psychology; (2) resources were valued less in a mate than character; and (3) preferences for a sperm donor were evidently reflective of a long-term mate-choice psychology with respect to character. This also suggested that the closest model from

attributes; that is, women believed these attributes were quite likely to affect a resultant child. (2) Attributes indicative of good character (e.g., kindness and understanding) have been identified as highly desirable in potential long-term mates by women (e.g., Buss, 1989), and character was considered the most important factor for a long-term mate in all three replications of my study.

The experimental results may not be directly generalizable to women who use DI, as most subjects were in their twenties, and women who use DI typically have failed to conceive after several years in a sexual relationship and are in their thirties. Furthermore, the subjects in these experiments probably were not considering having children at that time. These subjects did, however, value attributes in a sperm donor that have been found to be of concern to recipients of DI, and that they believed were likely to affect a resultant child. Analyses of women's preferences and choices of donors in a DI program would provide both a validity check on my experimental findings and further information about what women want in their donors. On an anecdotal note, when I asked a recipient at a sperm bank what she wanted in a donor, she replied, "You know, someone you'd like to date."

Concluding Remarks

The study of female mate choice provides a theoretically important, female-oriented perspective on animal behaviour. Evolutionary psychological analyses of mate choice focus on the relevant cues and associated mental processes that influence behavior. This perspective assumes that women's evolved mate choice psychologies have resulted from a selective history of sexually differentiated parental investment that influenced preferences for mates in both the long-term and extrapair mating contexts. Women's choices of sperm donors provide an evolutionarily novel context in which to study the psychology of female mate choice. Choice of sperm donor and mate choice shares important similarities, as women's decisions in both contexts will affect offspring condition and future reproductive options. And, indeed, there were striking similarities in women's preferences for sperm donors and long-term mates.

In light of the popularity of DI techniques and the extensive discussion surrounding reproductive technologies, it is surprising that there is so little information about women's preferences for sperm donors. Few studies have addressed what information DI recipients want or how they would choose donors if given the opportunity. Until recently, information and choice were not even issues, as medical personnel typically chose the donor and provided recipients with minimal information because of a perceived need to protect the donor's anonymity. Recently a number of studies suggest that recipients do, in fact, want more information, such as about the donors' health and personalities. From an evolutionary perspective, it is assumed that women have been selected to have control and

choice over their reproduction, so it is not surprising that recipients would want more information and control in the DI process. An increase in the number of DI programs, in which donor information is more routinely available, suggests that there is a demand for more information and control by women in the DI process.

Findings from my three experiments indicate that women value information that describes the donor's character, information that is generally missing from the protocol used to choose a donor in DI programs. I feel that the DI process can be made much easier for women psychologically if they are given information and choice about their donors, and the well-being of women is likely to enhance maternal investment to the benefit of the offspring. The use of both an evolutionary theoretical framework and a feminist perspective, which question procedures that do not respect women's reproductive autonomy, can result in new insights and perhaps, ultimately, change.

Acknowledgments

I am indebted to M. Wilson for her encouragement and extensive feedback on this chapter. I thank P. Gowaty for putting together the first conference on evolutionary biology and feminism, and for giving me the opportunity to be a part of it. Thanks also to M. Daly, A. Yonelinas, P. Gowaty, and M. Lalumière for discussion and comments on an earlier draft of this chapter. This research was supported by a scholarship from the Natural Sciences and Engineering Research Council of Canada.

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Feminism and Evolutionary Biology

Boundaries,
Intersections,
and Frontiers

Edited by
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Adair
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Cover design: Curtis Tow Graphics
Illustration: "Solitons of Queen Nefertiti" by Terry Barrett

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Printed in the United States of America

Chapman & Hall
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New York, NY 10003

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1 2 3 4 5 6 7 8 9 10 XXX 01 00 99 98 97

Library of Congress Cataloging-in-Publication Data

Feminism and evolutionary biology : boundaries, intersections, and
frontiers / edited by Patricia Adair Gowaty.
p. cm.

Includes bibliographical references and index.

ISBN 0-412-07351-X (hardcover : alk. paper). — ISBN 0-412-7361-7
(pbk.)

1. Feminism. 2. Human evolution. 3. Human biology.
4. Sociobiology. 5. Feminist theory. I. Gowaty, Patricia Adair.

HQ1154.F4426 1996
305.42—dc20

96-20305
CIP

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British Library Cataloguing in Publication Data available

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