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EVOLUTIONARY PSYCHOLOGY, HUMAN MATING STRATEGIES AND THE SEXUALLY TRANSMITTED DISEASES

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In an invited review of the book entitled Behind the One-Way Mirror: Psychotherapy and Children, by Katharine D. Fishman, to appear in the journal Contemporary Psychology, in 1997, Brito[2] emphasized some crucial philosophical issues in reference to brain-mind relations and suggested that on Darwin's dangerous idea (in a Dennettian sense – Dennett[10]) of evolution through natural selection could allow us to study the workings of the human brain in the mediation of normal and pathological behavior.

INTRODUCTION

Moreover, he advanced the notion that "factors related to type of treatment (and therapist) might very well interact with the preexisting brain reserve capacity (the neutral archictecture blueprinted by genetics and sculpted by the environment, thereby determining outcome [of psychopathology])". Brito[2] ended his review with the consideration that "a rapprochement of neurology and the behavioral science seems inevitable". Therefore, the basic premise of the present essay is that brain processes mediate behavior, including hating, loving and mating! For the sake of clarify, this essay will be divided into three sections: 1) mating systems and sexual selection; 2) human mating strategies, and; 3) implications for the sexually transmitted diseases.

MATING SYSTEMS AND SEXUAL SELETION

"This form of selection depends, not on a struggle for existence in relation to other organic beings or to external conditions, but on a struggle between the individuals of one sex, generally the males, for the possession of the other sex. The result is not death to the unsuccessful competitor, but few or no offspring"[8].

The above note on the possible relevance of sexual selection for the evolution of mating systems was followed by a treatise on the subject, The Descent of Man and Selection in Relation to Sex, published twelve years later[9]. Most of this volume pertained to the study of courtship, i.e., mating strategies, of animals.

For a complete review of mating systems, the reader is referred to Brown[4]. Briefly, mating systems are "those aspects of a species' social organization that determine the ways is which males and females come together for breeding"[4]. Perennial monogamy mating systems are characterized by pair bonds being formed for life or at least for several years (e.g., swans), while seasonal monogamy refers to pair bonds lasting only for the breeding season. Polygamy is a system in which and individual has more that one mate, none of which mates to another individual, and implies a kind of bond determined by dominance or attraction, between the mates. The bond may be successive, as in serial polygamy, or simultaneous polygamy. Polygamy can be further subdivided into polyginy, the most common, in which a male mates with two or more females, and polyandry, in which a female mates with more than one male. According to Brown[4], polygyny is the preferred mating system for the most mammals and about 2% of the world's bird species. Finally, in promiscuity, there are no pair bonds, and males and females copulate with many individuals of the opposite sex. Therefore, promiscuity is different from polygamy in the sense that no individual has exclusive rights over any individuals of the opposite sex.

Brown[4] correctly emphasize that the mating system species cannot be clearly categorized, but represents a mixture of different mating systems. According to him,

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The perennial monogamy mating systems are characterized by pair bonds being formed for life.

a worldwide survey of mating systems in human populations revealed the existence of perennial monogamy, serial monogamy, polygyny, polyandry and promiscuity. Therefore, "to categorize the human species into any of these types would be a gross oversimplification" [4].

How are we to understand the evolution of a gamut of different types of mating systems? Most likely, as consequence of a differential effect on the rate of evolution of mating behavior. The predicament of a male (usually but not only) which cannot find a mate is bleak in evolutionary terms. This predicament is conceptualized by sexual selection, i.e., the differential production of progeny by different genotypes as a result of competitive mating[4].

Darwin[9] recognized two main mechanisms by which sexual selection can operate: (1) the influence of male dominance and (2) the influence of female choice, or "sexual preference". However, Brown[4] notes that these categories are not mutually exclusive.

Species in which sexual selection is predominantly of the male-dominance type share many features as frequent inter-male aggressive conflicts with the female as the object of aggressive competition, high variability in number of females per male, success in having access to females correlates with dominance over males, pair bonds tend to be faint or nonexistent, sexual dimorphism is extreme, full physical maturation is reached later by males, mortality rates are higher for males, especially during the breeding season, there are more females than males among adults and, most importantly, there is little or no paternal care of offspring.

Species in which sexual selection operates mainly through the process of female choice (sexual preference) share several characteristics with species in which sexual selection is of the male-dominance type. The major difference between the two groups in that in the first group, signals and structures in males are used to impress the females, whereas in the second group, signals and structures are used for fighting against other males.

Brown[4] emphasizes that various in mating systems among species are partly due to phylogeny and also to ecology. According to his views, mammals are rarely monogamous because males, lacking mammary glands, cannot contribute to the nurturing of the offspring above what can be offered by the females. On the contrary, they might aswell compete for limited resources in the territory. Therefore, monogamy would be disadvantageous for females. Birds, on the other hand, are more likely than mammals to be monogamous because both the male and the female can contribute in maturing of the nurturing of the offspring. It can be adduced then that the role of paternal care exerts a major influence in the evolution of mating systems. Other relevant factors would include the appearance, the behavior and the territory of the male. Furthermore, genetic models of the consequences of sexual selection predict the presence of genes that help females choose the most attractive males and also that these genes will be tightly linked with genes influencing male attractiveness (e.g., Brown[4]).

After this brief overview, we can turn our attention on the relevance of different mating systems and the concept of sexual selection for our species, or should these concepts be considered completely irrelevant, and even preposterous, for Homo sapiens sapiens?

HUMAN MATING STRATEGIES

Let us imagine for a minute to be possible to travel back in time steps of a single generation and gradually reset the clock about 40.000 generations ago. A few things would emerge from this admittedly speculative exercise. The mere fact of our existence in the present signifies that we are the product of the successful mating of our parents, grandparents, great-grandparents and so on in the past towards the dawn of our species. We are nothing but the result of the struggle of our ancestors in their quest for survival, and reproduction! Therefore, it would be naïve to ignore our species' evolutionary history in an attempt to understand our current mating strategies.

As we discussed previously in the essay, all types of mating strategies found in animals are also found in human populations. We can then pose the question: What do we expect from a mating partner? Psychodynamic oriented psychological theories would suggest that people search for mates who resemble archetypical images of the opposite-sex parent. Other psychological theories emphasize choices based on complementary or similar characteristics to one's qualities. Research in the evolutionary psychology of mating selection, however, demonstrates that men and women use different strategies, as it would be expected from research in animals. As defined by Buss[5], the new discipline called evolutionary psychology represents an attempt "to identify underlying psychological mechanisms that were the products of evolution – mechanisms that help to explain both the extraordinary flexibility of human behavior and the active mating strategies pursued by women and men". However, Dennett[10] views evolutionary psychology in a broader context as "the marriage of sociobiology and cognitive psychology". In this sense then human mating strategies would only be one of many areas of interest of this new discipline.

In this book entitled The Evolution of Desire: Strategies of Human Mating, Buss[5] presented the results of surveys of mating preferences of male and female college students in the United States and more than 10.000 men and women in 37 countries (including Brazil, Sweden, Germany, Zambia, Paraguayan and Venezuelan indian tribes among many others), in a worldwide collaborative effort. A summarized version of the data was published elsewhere[6]. Although some of the results from this research may be interpreted as reflecting cultural biases, the great majority of the data indicate that human mating strategies are independent of culture. According to that author, human mating is inherently strategic in the sense of solving specific problems in human evolutionary history and so we are

not necessarily aware of its intricate workings. Moreover, Buss considers that mating strategies are context-dependent, i.e., men and women behave differently depending on whether the context presents itself as a short- or long-term mating prospect. Finally, he emphasizes that men and women have faced different strategies. Let us review briefly here the data gathered in this cross-cultural research.

In promiscuity, males and females copulate with many individuals of the opposite sex.

There was no difference between the sexes as to the interest in seeking a long-term mate. However, men were found to be much more prone than women are to seek short-term mating (casual sex). Additionally, men reported to desire a greater number of sex partners than women both in their lifetime and in certain period of time. Furthermore, it was reported that both men and women are equally likely to consent to sex after about a five-year period in their relationship. However, men were much more likely than women to consider sexual intercourse for all shorter time intervals.

Buss[5,6] also reports that men value promiscuity and sexual experience in a partner for short-term mating but not for long-term mating. Women, on the other hand, do not find promiscuity desirable under any circumstance. By the same token, men are reported to find women with a low sex drive much less desirable for short-term, as opposed to long-term, mating. Also, men in search of a long-term mate are willing to commit and invest, but in the context of short-term mating minimize commitment and investment. Women strongly want commitment from a long-term mate, and find it only slightly undesirable in a short-term mate.

Buss and his group of colleagues also found that men seeking either a short- or a long-term mate prefer young and physically attractive women probably because such features signal reproductive value. Women also prefer physically attractive men, but this was much less important than to men. Additionally, Buss[5,6] reported that men value chastity and dislike infidelity more than women. Furthermore, men place greater emphasis on the sexual rather than the emotional type of infidelity, whereas for women the converse is true.This difference is consistent with the hypothesis of sperm competition in the sense that men will produce more sperm after spending time away from his wife possibly to displace the sperm from other men from her vaginal tract as a consequence of the opportunity provided for casual sex.

It will be recalled that paternal care of the offspring exerts considerable influence on mating strategy. This is borne out by the results reported by Buss and collaborators[5,6] in the sense that women prefer both short- and long-term mates who will lavish them with resources, and find highly undesirable men who are hesitant to expend resources on them. They also found that women are more finicky than men in choosing a short-term mate possibly because they use a short-term strategy to assess prospective long-term mates. Along this same line, women were shown to put a premium on men who could provide enough resources for her offspring. In a somewhat different vein, a man's failure to economically support his wife and children is a significant sex-linked cause of divorce[1].

The evidence presented above could be summarized by stating that women are attracted to men who are willing and can provide unlimited resources for her and her offspring, whereas men prefer young, physically attractive and reproductively valuable women. As discussed above, these general conclusions are consistent with data obtained in several different cultures in different countries. Since the observations were found to be consistent across cultures, it is tempting to conclude that biology, not culture, determines human mating strategies. Dennett[10] warns us against such inference: "showing that a particular type of human behavior is ubiquitous or nearly ubiquitous in widely separated human cultures goes no way at all towards showing that there is a genetic predisposition for that particular behavior". To put it in another way, the wheel could be reinvented several times over without the need of either genetic descent or cultural transmission. However, considering the costs (physical and emotional) of pregnancy to women, the probable role of paternal care in the evolution of mating strategies, and the acceptance of Hamilton's[11] conceptual framework of kin selection among evolutionary biologists[4] and philosophers[10] would render the hypothesis put forth by Buss[5,6] at least theoretically plausible.

How would homosexuality fit into summary provided in the last paragraph? How would homosexual men choose a mate: As a heterosexual female or a heterosexual male? Reciprocally, how would homosexual women choose a mate: As a heterosexual male or a heterosexual female? As discussed by Buss[5], the issue of homosexual relationship provides an acid test for the evolutionary substrate of sex differences in the desires for a mate. Interestingly enough, the available data indicate that homosexual men and women tend to choose a mate as their heterosexual counterparts, i.e., homosexual men put a premium on beauty and youth, and lesbians place even less emphasis on physical appearance than heterosexual women[5]. It can be concluded then that biological/hormonal sexual characteristics, and not sexual orientation per se, determine sex differences in mating preference thereby strengthening the hypothesis for an evolutionary basis of sex differences in the desires for a mate.

The acceptance of the idea that human mating strategies is firmly on evolutionary grounds would pose the issue of what to make of such ideals as love and romance, or the "afetividade" of Brazilians[7]? It might be suggested that the words love and romance represent semantic shortcuts for the inherently complex mating strategies of men and women in their selfish quest to eternize their genes. The acceptance of the biological roots of love and romance and, for that matter, afetividade should in no way demean what they represent for human life and culture.

What is somber to face is the prospect of fiddling with the genetic substrate of evolution, a capability unique to our species. Infertile (and, therefore,

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evolutionary dead-ends) people can now manage to eternize their genes through unnatural methods such as in vitro fertilization. Cloning techniques are already at hand and being used in agribusiness. It is clearly possible to envisage the potential evolutionary impact of advances in biology. On the other hand, our species may soon reach an evolutionary cult-de-sac and it is likely that a super-human species will emerge as a kind of "paradigmatic shift" in a Kuhnian sense. It is beyond the purpose of the present essay to dwell on these issues. However, they should certainly be referred to the attention of bioethicists and philosophers for a proper treatment.

In an attempt to unify concepts from evolutionary psychology (human mating strategies), molecular biology (genomic imprinting), neurobiology and psychoanalysis, Brito[3] advanced a hypothetical model. Although the model is highly complex, a few comments are in order for the present essay. According to this model, events related to genomic imprinting along maternal and paternal lines exert impact on cortical and subcortical brain structures, respectively. It can be presumed that cortical brain processes mediate success in job performance and life in general (the Ego and Super-ego of psychoanalysis), which is exactly what women, expect from a mate. Subcortical brain mechanisms, on the other hand, are involved in basic drive mechanisms, such as sexual behavior (the Id of psychoanalysis), and it is of interest to note that the men prefer reproductively valuable mates. Sublimation would be represented, in this model, by the interplay of activity between brain structures related to genomic imprinting along the maternal and paternal lines, i.e., cortex and subcortex. It remains to be seen whether this hypothetical model will prove to have heuristic significance.

Human mating strategies on way or another culminate in sexual intercourse. The interchange of bodily secretions between two organisms during sexual intercourse provides an ideal medium for the propagation and therefore perpetuity of microorganisms. It should be apparent then that the understanding of the roots of human mating strategies has major implications for the STDs.

IMPLICATIONS FOR THE SEXUALLY TRANSMITTED DISEASES

Sexually transmitted diseases (STDs) continue to represent a major health problem worldwide. Diseases once thought to be under the control of public health authorities are making a comeback withdisastrous consequences as, for example, syphilis. Other diseases, unknown to health authorities up until recently, are reaching epidemic proportions as is the situation with SIDA. Wives are unknowingly infected by their unfaithful (or, for that matter, bisexual) husbands with the HIV and may pass on the disease to their offspring. Public health authorities spend large amounts of limited resources in educational campaigns only to find their limited impact on the epidemiology of STDs. The Church admonishes that SIDA and other scourges are the result of evil and lustful behavior to be mercilessly condemned.

To make things worse, STDs microorganisms seem to be developing resistance to first and second generation antibiotics rendering the treatment of several of the STDs costly both economically and emotionally. All of this makes a very bleak scenario indeed. The question is whether biology or, more to the point, evolutionary psychology can be of any assistance in the understanding of the epidemiology and difficulties faced by public health authorities in relation to the STDs. Can hypotheses developed within the framework of evolutionary psychology be of assistance in the design of educational campaigns for the prevention of the STDs or even in the development of nonmedical, supportive psychotherapy for STDs, specially SIDA?

As discussed previously in this essay, the mating strategies of human populations can include most of the strategies used by other animals. A major difference between our species and others seems to be in the extent of the significance of the context for mating. Depending on the context, humans may choose a short-term rather than a long-term mating strategy (a good example of such a contextual shift in strategy would occur during Carnival, as most Brazilians would agree). Another contextual factor, as noted by Buss[5,6], would be the sex ratio found in a community. A surplus of men would shift the strategy towards monogamous relationships, whereas an excess of females would favor casual sex as men would be reluctant to commit to a single woman. Simultaneously polygyny is commonly found in arabic cultural contexts, and puts significant pressure on men to compete for women.

Preoccupation with infidelity should depend on mating strategy. Since men can never be 100% sure of their patternity, and considering the cost of paternal care of the young, it is reasonable to expect that preoccupation with infidelity (and, incidentally, prevalence of wife battering) should be higher in monogamous than polygamous mating systems, and the evidence is consistent with this expectation[5]. The irony of infidelity (and promiscuity) is that such a trait in men could not have evolved had women denied them its expression[5]. Additionally, expect for the perennial monogamous strategy, mates are replaced for a variety of reasons whenever costs become substantially higher than accrued benefits. Therefore, a mobility in mating partners in human populations is to be expected.

This discussion above would suggest that variables related to mating strategy exert a major impact on the prevalence and incidence of the STDs. Higher initial incidence of SIDA in men are consistent with the ideas expressed in this essay in the sense that homosexual and heterosexual men are more likely to have casual sex than homosexual or heterosexual women. The fact that the prevalence and incidence for AIDS for men and women are now almost equivalent may signify that unfaithful (or bisexual) husbands have been infecting their wives, a speculation consistent with the available epidemiological data. The same reasoning would apply to adolescents just entering the mating market. It is

reasonable to hypothesize that young adolescent women were initially infected with HIV by older, unfaithful or divorced men in search of younger mates, although strong data to evaluate this hypothesis are lacking, as far as the author is aware.

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Public health campaigns should incorporate the context-specific characteristic of human mating strategies. Most of the resources should be invested (and they seem to be) during periods of time that favor casual sex such as Carnival and summer vacations. In addition, special attention should be directed at men and womem most likely to prefer short-term mating strategies as, for example, recently separated and divorced men and women, and possible homosexual men. Young adolescent females also merit special attention since they are the target of older, recently separated or unfaithful men. With time, the human landscape of SIDA affliction should encompass all age groups unless of course we make major strides in its medical treatment.

Nonmedical supportive psychotherapy is frequently recommended for SIDA patients. It is hoped that an understanding of the biological roots of human mating strategies will provide the assisting health professional with a broader view of the circumstances surrounding infection. Additionally, such knowledge should help this professional in the counseling of patients in order to minimize contagion of significant others in the family. Furthermore, this knowledge should also minimize the impact of the guilt usually imposed upon the patient by religion.

It must be the case that millions of years of evolution cannot be easily written off. Therefore, we in the health care community should expect a hard road ahead in the prevention of the STDs given the wide options of mating strategies available to human populations. The fact that this might be biologically true should in no way diminish our resolve as the stakes are very high indeed. A bright side of this admittedly somber story might be to view the SIDA epidemics as a strong type of evolutionary pressure on human mating strategies.

ABSTRACT

The present essay examines the probable impact of human mating strategies on the incidence and prevalence of the sexually transmitted diseases (STDs) in light of recent hypothetical developments in the evolution of such strategies in our species (Homo sapiens sapiens). The ideas offered by the author are based on the revolution engendered by Darwin's conceptual insights on natural selection, and more important for the present essay, sexual selection.

It is hoped that a more biological view of human mating strategies (and, by extension, of love) will broaden in perspectives of the epidemiolgy the STDs. Additionally, it is hoped that this view will place nonmedical (behavioral) interventions such as marital (couple) counselling in cases of STDs on firm biological grounds. Furthermore, a strictly biological view is consistent with the limited success of sexual education in the prevention of these diseases.

Key words: evolution, human mating strategies, sexually transmitted diseases.

Running title: Evolutionary Psychology and Sexually Transmitted Diseases.

RESUMO

No presente ensaio teórico, o autor examina o provável impacto de estratégias do acasalamento humano na incidência e prevalência das doenças sexualmente transmissíveis (DSTs) à luz de teses recentes sobre a evolução destas estratégias na nossa espécie (Homo sapiens sapiens). As idéias aqui apresentadas se fulcram na revolução engendrada por Darwin[9] no século passado pelos conceitos de seleção natural, e mais importante para os nossos objetivos no presente ensaio, seleção sexual. Espera-se que uma visão mais biológica do acasalamento humano (e, por extensão, do amor) possa ampliar o horizonte das questões epidemiológicas relacionadas às DSTs, além de colocar as intervenções não medicamentosas em casos de DSTs, como, por exemplo, aconselhamento de casal, em bases solidamente biológicas. Ademais, esta visão é consistente com o sucesso limitado da educação sexual na prevenção destas doenças.

Unitermos: *evolução, estratégias de acasalamento humano, doenças sexualmente transmissíveis.*

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