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Introduction

Darwin observed several facts which contradicted his theory of natural- or survival selection, one of which was the dazzling plumage of peacocks that appeared to have nothing to do with survival, and in fact seemed to be more of an open invitation to potential predators. The fact that peahens prefer to mate with males who have the most brilliant and luminescent plumage, and that males are often larger than females in species in which they need to engage in physical combat in competition over females, (Crawford & Krebs, 2008) lead to Darwin's second evolutionary theory: the theory of sexual selection. Competition among members of the same species for reproductively relevant resources is the pillar of Darwin's (1859) theory of natural selection (West-Eberhard, 1979) and he proposed two primary ways in which sexual selection could operate. Firstly, intrasexual competition; consisting of competition between members of one sex, the result of which leads to mating access with the opposite sex, and secondly, intersexual selection or preferential mate choice. Intersexual selection refers to the tendency of one sex to choose as mates certain members of the opposite sex based on specifically desired qualities. Darwin referred to intersexual selection as "female choice" because he observed that throughout the animal kingdom females were prone to be more discriminating than males in their mating choices, (Crawford, Krebs 2008). In the past several decades the evolutionary perspective on interpersonal attraction and mate selection has gained increased attention and proposes that humans are governed by rules of attraction and mate selection that prioritize the conception, birth, and survival of their offspring. (Mahfouz, et al. 2008). Intrasexual selection in

humans appears to operate mostly indirectly, through social hierarchies, rather than through direct competition as can be observed in the animal kingdom, e. g. two antelopes locking horns in combat over a female. In this way patterns of sexual selection do not immediately involve environmental changes, and neutral or even dysfunctional traits could potentially develop through female choice (Buss, 1986). This begs the important question; what are the preferred characteristics valued by human beings when it comes to mating?

One of the main strategies of competition in mating is to make oneself more attractive than others of the same sex by use of specific tactics and displaying certain resources (Buss, 1988). Trivers (1972) further illuminated Darwin's theory of sexual selection when he suggested that the one driving force behind sexual selection is the relative parental contribution of both sexes in their offspring. Males should adopt a reproductive strategy which maximizes the opportunity to mate, and females should adopt a strategy that relies on choice, only mating once the best male out of a number has been identified. According to Buss (1986) under conditions of female choice, males are expected to display the traits most valued by females, and may compete for elevation in hierarchies while women tend to favour high-status men. Buss (1988) conducted a number of studies with the hypothesis in mind that patterns of human intrasexual competition can be predicted from knowledge of mate selection criteria, and examined preferences in partner choice. He found three replicated sex differences; men more than women preferred mates who were physically attractive, and women more than men preferred mates who showed good earning potential and who were college

educated. Thus, it would seem that females can increase their reproductive success by choosing a man of high status with sufficient resources, thereby able to provide material security to successfully raise offspring. Males, on the other hand, increase their reproductive success by choosing women who are receptive, fertile, and possesses characteristics suggestive of being a good mother (Singh, 1993). Where as the reproductive value of a man can be easily assessed by looking at external symbols of power such as social- and economical standing, women's reproductive value is concealed. However, from an evolutionary based perspective it is assumed that physical attractiveness is primarily a reflection of a woman's reproductive success (Buss, 1987), and is portrayed in this way by certain desired physical characteristics like full lips, clear skin, clear eyes, an abundance of hair, symmetry, good muscle tone, youth (Buss, 1993) and lower body mass (Swami and Furnham, 2007). From an evolutionary viewpoint, both sexes should have evolved a preference for mates that possess these desired qualities, increasing levels of competition to project such characteristics and ensure reproductive success.

The number of options available when deciding on a mate has become potentially overwhelming in modern times. Not only are there more people in our local environment, but modern dating methods present us with more options than humans have previously had to deal with. However, research suggests that mate qualities valued by people offline are the same as those valued by people online (Lenton, et al., 2008), and that online interaction is driven by the same needs as face-to-face interaction. Thus, online interaction should not be regarded as a separate arena but as an integrated

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part of modern social life (Wellman & Hathornthwaite, 2002). A study by Hitch et al. (2005) which looked at desirable qualities as projected on online dating sites found the most striking difference across gender to be related to earnings and education. Although both sexes show a preference for partners with higher incomes, this preference is much more pronounced for women, as also found in Buss' studies. It was also found that although users prefer a partner with a similar education level, men tended to have a strong dislike for a better educated partner, whereas women avoided less educated men. In another study focused on the importance attached to physical attractive qualities, Hancock and Toma (2009) studied profile pictures of women on dating websites by looking at self-presentation and in particular at levels of deception in the form of the number of discrepancies as contained in photographs. They assumed that from an evolutionary perspective youthfulness and physical attractiveness would be qualities valued more by women than by men, and found that women's photographs were indeed less accurate, with discrepancies relating to mentioned weight, hair length and age as preferred by men, and higher incidences of retouching photos. Although earlier studies focused on self-presentation on internet dating websites, researchers have recently shifted their attention to self-presentation in less anonymous settings like social networking sites. A study by Ellison et al. (2006) found that people tend to act differently in social networking environments when compared to those interacting in anonymous settings. This finding had vast implications in identity formation in the online world, as it basically indicated that online self-presentation varies according to the nature of the setting. Along with dating sites, friend-networking

websites like MySpace and Facebook have become very popular, and offer a highly controlled environment for self-presentational behaviour- an ideal setting for impression management (Mehdizadeh, 2010). A study by Zhao (2008) examined identity construction on Facebook, with the main hypothesis being that Facebook users would engage in what internet dating sites users engage in- the presentation of their hoped-for possible selves, defined as socially desirable identities an individual aim to construct, in this case online. They distinguished between implicit identity claims, which involved the display of photos and profile pictures, and explicit identity claims, involving verbal descriptions of the self under the “ About me” section of facebook. However, it was found that this was the least elaborated of identity strategies and photos were mainly used for identity construction. Results were consistent with internet dating studies and the way in which a self which is more socially desirable was projected. The construction of the self online has been found to differ between the sexes because different kinds of social roles come into play during interpersonalcommunication(Archer, 1989). Women, unlike men, tend to place greater importance on sexual-interpersonal aspects of self-definition, and a review of gender differences in identity development revealed few gender differences, apart from in the areas of sexuality andfamilyroles, supporting findings that relationships are more important to women’s identity formation than to men’s (Manago, 2008). Research highlights that it is critical that social scientists don’t view Cyberspace as one generic space, but rather to consider how different spaces online are constructed (Whitty, 2007). Specific characteristics of internet communication may affect gender

self-presentation, and the way in which Facebook allows users to present a very strategic presentation of their selves and to control what remains hidden and what is revealed, makes it a fascinating medium to study.

The objectives of the current study was to look at the effect of gender and relationship status on the projection of reproductively valued qualities on Facebook from an evolutionary perspective. From an evolutionary viewpoint one would expect similar gender differences as was found in Buss' studies, with women placing more of an emphasis on physical attractiveness and youth and the way this is projected on Facebook, and men projecting qualities which portray status and competitiveness. The projection of sociability was correlated with "warmth" and it was predicted that women would score significantly higher on the projection of this characteristic, with single women scoring significantly higher overall. Important to note is that the projection of these mentioned reproductively valued qualities would be of an unconscious- and implicit nature, considering that Facebook is primarily seen as a social networking website, rather than as a virtual arena designed to meet members of the opposite sex, as is the case with online dating websites. Both gender and relationship differences in the projection of physical attractiveness, competitiveness, nurturing qualities, status and sociability were predicted. It was predicted that married persons, already being in a position of long term mating, would project these qualities significantly less than single persons.

There were four main hypotheses:

Hypothesis one: Single males will score significantly higher on projected status and -competitiveness than single females.

Hypothesis two: Single females will score significantly higher on projected physical attractiveness, -nurturing qualities and -sociability than single males.

Hypothesis three: Single males will score significantly higher on both projected status and -competitiveness in comparison to married males.

Hypothesis four: Single females will score significantly higher on projected physical attractiveness, -nurturing qualities and -sociability than married females.

Discussion

Darwin's theory of sexual selection suggests that desirable members of the opposite sex possess reproductively valuable assets over which members of the same sex compete. Gender differences typically exist when it comes to which reproductively relevant resources are valued by men and women.

Females seem to increase their reproductive success by choosing a man of high status with sufficient resources, thereby able to provide material security to successfully raise offspring. Males, on the other hand, increase their reproductive success by choosing women who are receptive, fertile, and possesses characteristics suggestive of being a good mother (Singh, 1993). Research suggests that mate qualities valued by people offline are the same as those valued by people online (Lenton, et al., 2008) and studies investigating mating preferences on online dating websites display similar

findings, with women going to significantly greater lengths than men to enhance physical attractiveness on profile photos, and men emphasising their status and income to a significantly greater extent than women. The present study proposed that evolutionary differences between the sexes with regards to sexual selection should also exist in non-dating online environments like the social networking website, Facebook, with females placing more of an emphasis on projecting physical attractiveness, sociability and nurturing qualities, and males projecting competitiveness and status. Most of the hypotheses were confirmed and were consistent with other studies on mating preferences from an evolutionary viewpoint. Several conclusions can be drawn from this study. Firstly, support was found for significantly greater female than male use and perceived effectiveness of projecting physical attractiveness and nurturing qualities. Secondly, support was found that single women perceive the effectiveness of projecting physical attractiveness to a significantly greater extent than married females. Thirdly, support was found for significantly greater male than female use and perceived effectiveness of competitiveness. Fourthly, support was found that single persons perceived the use and effectiveness of projecting sociability as significantly greater than married persons. Finally, the perceived use and effectiveness of the projection of status did not vary significantly for either gender or relationship status.

These findings provide evidence that mating preferences are also displayed implicitly in non-dating online environments where the main agenda is social networking, rather than attracting a mate. This implies that the projection of reproductively valued assets could also be an unconscious process,

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engrained in our evolutionary biological make-up. The results of this study will now be discussed in terms of each hypothesis, after which the practical implications of the study will be highlighted and suggestions will finally be made on how future studies could utilize and expand these findings.

Physical attractiveness

As predicted, significant results were found for the projection of physical attractiveness for gender, with women scoring higher overall than men, and also for relationship status, with single persons scoring significantly higher than married persons. These findings provide evidence that pressure on women to appear young and attractive is just as prevalent in today's society as it was when Darwin wrote his theory on sexual selection in 1871, noting that " In civilized life man is largely, but by no means exclusively, influenced in the choice of his wife by external appearance", 1871. (p. 738). The pressure to be beautiful can be most blatantly observed on dating websites where the intrasexual battle between women ensues as they compete for the attention of a potential partner, and rely solely on photos as a method to project physical characteristics, even lying about age and weight to appear more attractive (Hitsch et al., 2005). One study found that men were more likely to respond to an

advertisement in which a woman identified herself as a recovering addict than to an ad in which the woman identified herself as obese (Minervini & McAndrew, 2005). Findings of this study reveal Facebook to be just as a competitive virtual arena which exhibits similar characteristics to online dating websites, including the strategic way in which one's projected

physical attractiveness is manipulated and enhanced online. Women displayed considerably more of a tendency to change their profile pictures on a regular basis than men, thereby drawing attention to- and emphasizing their looks to a much greater extent than men. This tendency was particularly highlighted among single women. Considering that evolutionary biology rules out beauty for its own sake (Derry, 2008) these findings reflect the unconscious way in which women on Facebook project reproductively valued qualities to the opposite sex through the implicit medium of photography. Although facial attractiveness is expected to predict the popularity of both men and women, and emerged in virtually all dating studies based on real interactions as a powerful predictor of popularity (Asendorpf et al., 2011), women tend to score significantly higher on projected physical attractiveness in comparison to men, as also supported by the findings of this study.

Further significant differences were found between single- and married persons, with single users projecting physical attractiveness more than married users. This supports predictions, and reflects that there is less pressure on married couples to emphasise physical attractiveness, which can be attributed to the fact that they are already in positions of long term mating, and there is thus less of a need to project this asset.

Another interesting finding in the current study was that only 52% of single women listed their age, followed by 78% of married women, 88% of single men, and finally 94% of married men. This further highlights the pressure on women to appear youthful, and it is interesting to note that it is

predominantly single women who do not choose to list their age. Considering that 78% of married females list their age, one can not generalize this finding to women in general. The conclusion which must thus be drawn is that single women tend to de-emphasize elements relating to age in an attempt to appear more youthful. It is also interesting to note that the average age of single women was 24 in comparison to married women who were aged 29 on average. Considering that married women were aged slightly older than single women, one would in fact expect them to be more secretive about their age. However, this research indicates findings to the contrary and highlights the reproductive value of appearing young for single women. These findings are supported by various previous studies into mating preference that found both physical attractiveness and youth as indicative of health and fertility in women, and as valued significantly by men as sources of reproductive value (Buss et al., 1990; Buss & Barnes, 1986; Buss et al., 2001; Buss & Schmitt, 1993; Feingold, 1990, 1992; Kenrick & Keefe, 1992; Kenrick, Keefe, Gabrielidis, & Cornelius, 1996; Singh, 1993; Singh & Young, 1995).

Competitiveness

Human beings tend to live in groups and all groups have status hierarchies, whether formal or informal, with reproductively valued resources usually abundant at the top rather than the bottom, creating steep levels of competition (Buss, 2001). Levels of intrasexual competition also increase, especially among males, as male resource display is judged as more effective than female resource display when it comes to attracting a mate.

Men more than women display characteristics that would lead to the likely

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acquisition of resources like ambition and industriousness (Buss, 1988). In the current study significant gender differences were found for the projection of competitiveness, with males overall scoring significantly higher than females, as predicted. Previous studies found that men were more likely to display resources as a tactic of intrasexual competition than women, also linking to studies done on mating preferences as displayed on online dating websites which found that men tended to project their status in society, as well as their income, to a much greater extent than women (Hitsch et al., 2005, Toma et al., 2008, Mahfouz, 2008). Although projected levels of competitiveness is not viewed as directly projecting resources or income in the case of this study, it is seen as a powerful indicator of a male's ability to succeed in allocating valuable resources such as financial income. Levels of competitiveness did not vary significantly between single- and married men as predicted, indicating that the projection of competitiveness is valued by males in general and not just single males. This could arguably be explained by the fact that, from an evolutionary viewpoint, men may have evolved over human evolutionary history a powerful need for sexual access to a large number of women (Buss, 1993) which in combination with the innate ability to father offspring until much later in life than women are capable of biologically, entails higher levels of competitiveness to suffice throughout a male's life. In one study men stated that they would ideally like to have more than 18 sex partners in their lifetimes, whereas women state that they would desire only 4 or 5 (Buss & Schmitt, 1993), and these findings were replicated twice when 75% of men but 0% of the women approached by an attractive stranger of the opposite sex consented to a request for sex (Clark & Hatfield,

1989). From an evolutionary viewpoint, marriage is a relatively modern concept, implying that gender differences with regards to intra- and intersexual competition have not changed dramatically in modern times. In this sense competitiveness leads to a higher position in the social hierarchy, and better chance of providing for one's offspring, and should not significantly vary between single- and married men, as findings illustrate in this study

The importance of physical characteristics in the female choice of a mate is prevalent throughout the animal kingdom, and one benefit of a woman in permanent mating conditions is the physical protection offered by a man, Buss (2003). Considering that levels of competitiveness was correlated with participation in sports, one could further explore the possibility that physical strength as displayed in sports is valued as a reproductive resource by women- supported by studies such as Buss (1995) which found that women valued physical protection abilities more than men, in both short-term and long-term mating. Thus, it is additionally also possible that men project physical strength by appearing “ sporty” in profile photos as the reproductively valued asset of providing physical protection to female offspring. This could also account for the insignificant difference between single- and married males when it came to the projection of competitiveness, seeing that men can father (and thus protect) offspring until late in life.

Nurturing qualities

The current study predicted that women would score significantly higher on projected nurturing qualities than men, and this hypothesis was supported.

Both single and married women projected nurturing qualities to a greater
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extent than males. Stereotypically women are nurturing, where as men are somewhat more aggressive and less person-centred. Traditionally sex differences have been explained by the process of socialization , and the way men and women are influenced by societal norms to play acceptable gender roles. However, from an evolutionary viewpoint men would need to exhibit higher levels of aggression, and competitiveness, supported by the findings of this study, to protect their positions in society where as women with lower levels of competition and higher investment in their offspring are expected to show more nurturing behaviours (Workman & Reader). This study supports findings from previous research which highlight nurturing qualities in women as being innate, as illustrated in a study by Bernt (1986) in which it was shown that women are more attracted to intimate relationships than men (Berndt, 1986), and cross-cultural studies which suggests women to be more person-centred, in contrast to men who are more object-centred . There is also evidence that sex differences in nurturance has its origins in infancy, and a study by Simner (1971) found that infant girls more than infant boys were more likely to also start crying when they heard another baby cry, than when hearing a loud noise (Workman & Reader, 2001). Contrary to prediction single women did not score higher on projected nurturing qualities than married women with married women having the highest scores on projected nurturing qualities overall. A possible explanation for this could be that married women, who being married are in a more secure position to either have children- or already have children, are either consciously or unconsciously depicting salient nurturing qualities. This study also illustrates

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that the biological experiences of pregnancy and lactation generate a strong, instinctual drive in women to nurture (Silverstein, et al., 1999), as illustrated by the higher, although not significantly so, proportion of married women who exhibited nurturing qualities in this study versus single women.

Sociability

A significant difference between single- and married subjects was noted when it came to sociability, with single Facebook users projecting sociability to a greater extent than married users. This links to previous studies done on Facebook which found that most users attempted to project a socially desired self, claiming that they were “popular among friends”. Fierce competition was also noted among Facebook users for the size of social networks they claimed to possess, and competition to have the most amount of “friends”, Zhao (2008). Thus, it would seem that the desire to appear sociable or popular offline, also exists online. There is further support for the importance of social skills as found in a study by Buss (1989) which studied mating preferences across 37 cultures and found that kindness, intelligence and social skills were listed as the top criteria for a potential mate. This supports the current study’s prediction, that single Facebook users would appear significantly more social than married users. However, unlike predicted there was no significant difference between men and women when it came to projected sociability, revealing that the projection of warmth towards others is just as important for single men as it is for single women. Significantly lower levels of projected sociability in married couples could be a reflection of lower levels of social activity as portrayed in profile pictures, perhaps as a result of spending more time with their partners or children, but

could also indicate that there is less of a need to exhibit sociability, and thereby project popularity among friends .

Status

Status is closely correlated to financial income, and it was predicted that men more than women would display their status on Facebook, supporting studies such as one by Buss (1988) in which it was found that men more than women display characteristics that lead to the likely acquisition of resources, e. g. degree attainment. However, this was not the case, and no significant differences in the projection of status were found between either men and women overall, or single- and married subjects. There could be several explanations for this, one relating to previous studies done on online dating websites which found that both sexes tended to favour members of the opposite sex with similar educational levels. Considering the overwhelming support that previous studies provide with regards to the importance that women attach to resource income as a reproductive value and status as a reflection of financial income, another explanation could lie in the obvious fact that Facebook is a social-, rather than dating network, and that popularity as illustrated with regards to exhibiting sociability, is highly valued. Thus, it would be just as important for women than for men to list their status in a virtual social network where one would expect similar levels of education among friends or acquaintances as a general rule. Also, Facebook is arguably not different from online dating websites where users, both male and female, tend to list their status as a formality, but in which one study men stated in a questionnaire that they did have a particularly

strong distaste for a better educated partner, while women particularly avoided less educated men (Hitsch, 2005).

Conclusion

In conclusion, the implicit nature of photography and the unconscious way in which participants use it to project reproductively valued qualities to members of the opposite sex are particularly interesting findings. Facebook as a social networking website, in which users have control over self image and access to many tools with which to present themselves in a favourable way to others makes it a fascinating medium to further explore.

Limitations and suggestions for future research should be noted. Suggestions for future studies include conducting a cross-cultural study to see if there are any significant differences to note. Secondly, exploring other functions on the social networking website, such as the number of friends- or social networks a user possess, additional photoalbums, qualitative analysis of verbal descriptions under the “ About me” section or status updates of users, etc. The vast amount of additional information available on Facebook could be used to supplement current findings, and other popular social networking sites such as MySpace could be researched in a similar fashion. Thirdly, different age groups could be tested for significant correlations- or differences. Fourthly, data could be collected in combination with questionnaires, supplementing findings. Fifthly, a study looking at specific differences between the explicit and implicit projection of reproductively valued qualities on Facebook could be conducted. Finally, there are many other traits which both sexes highly value in the opposite sex like displaying

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humour, good manners, sympathy, good grooming (Buss, 1988), similar values, honesty (Whitty, 2007) etc. and future studies could aim to include these.

Although this study and its hypotheses were interpreted from an evolutionary perspective, additional theoretical accounts are possible, and it should be kept in mind that evolutionary explanations supplement, rather than replace traditional modes of explanation in psychology (Buss, 1988). These results may be seen as the start of an exploration into social networking websites and how resource valued traits are unconsciously and implicitly projected to members of the opposite sex, but current social psychological accounts should also be considered.