MARRIAGE AFFECTS COMPETITIVE PERFORMANCE IN MALE TENNIS PLAYERS

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Abstract. Cultural displays, such as art and science, are proposed to be used by males to compete for potential mates. As a result, the desire to engage in such behaviours will diminish following marriage. Male competition in sport can be considered a cultural display for potential mates, therefore male sporting performance will be negatively affected by marriage. Here we show that professional male tennis players perform significantly worse in the year after their marriage compared to the year before, whereas there is no such effect for unmarried players of the same age. Therefore the results suggest that following marriage, males experience an evolved psychological mechanism that leads to less motivation to engage in intra-sexual competition. Fluctuating testosterone (T) levels are discussed as providing the underlying biochemical changes necessary for such mechanisms.

Keywords: testosterone, marriage, male competition, mating effort

INTRODUCTION

MILLER (1999, 2000) states that artistic output by males acts as a 'cultural display' to attract mates. This claim has been further supported by empirical evidence; males are more creative when they have been romantically primed (GRISKEVICIUS et al. 2006), creative males are favoured by more fertile females (HASELTON and MILLER 2006) and creative activity is positively correlated with mating success (NETTLE and CLEGG 2006).

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KANAZAWA (2003) has further shown that male scientific and criminal behaviour may also be considered as cultural displays to attract mates, and that such output is greatest at times in an individual's lifetime when their desire to find a mate is highest. Kanazawa suggests that this is driven by an evolved psychological mechanism in males that compels them to engage in such behaviours as a form of intra-sexual competition for mates (KANAZAWA 2003). It therefore follows that such reproductive competition will diminish when the male either marries or has children as he shifts the allocation of his available resources from performing these displays in order to attract mates, to maintaining a partner and possibly caring for his offspring. The findings from scientists' careers support this (KANAZAWA 2000), as married scientists have their career peak (as measured by details of the individual's most significant contribution) at a younger age (when motivation to compete with rival males will be greatest) than unmarried scientists. Similarly, the distribution of age of peak scientific achievement declines more sharply in KANAZAWA'S (2000) population of married scientists than the unmarried scientists.

Whereas it has been shown that marriage can decrease male intra-sexual competition in displays of art (MILLER 1999, 2000), science and criminality (KANAZAWA 2000, 2003), sporting performance has thus far been overlooked. Indeed, ritualised competitions, such as tennis, can also be thought of as cultural arenas for male intra-sexual competition. Evidence for sporting performance being important in mate choice comes from FAURIE et al. (2004), who found that students who competed in sports had greater mating success than those that did not, as measured by self-reported numbers of sexual partners. Also, performance levels of athletes also positively correlated with mating success (FAURIE et al. 2004). We therefore predicted that performance in cultural displays of tennis among males would be adversely affected by a transition to marriage. This is due to the evolved motivational shift causing them to expend less effort competing with other males on the court, to being an attentive and caring husband at home. Tennis is a good sport to study as it is an individual sport with clear, quantifiable results and an international ranking points system for all professional players (see www.atptennis.com for more details), that allows for clear comparisons between and within players' careers.

METHODS

Information was sought from all male tennis players who had appeared in the top 100 players in the ATP singles rankings at the end of each year from 1995 to 2005. This consisted of a total 283 of players. Information on players' biographical profiles on the official Association of Tennis Professionals (ATP) website (http://www.atptennis.com/en/players), players' own websites and national tennis associations were consulted for the marital status of players and their year of birth. If they were married, information was sought as to what year they married, whether they had subsequently divorced or if they were a father.

Ninety-five players had married during their career. However some players were eliminated from this dataset for various reasons such as; incomplete/unreliable information, bans due to substance abuse or because the individual married either before 1996 or after 2004. Also, for this analysis only players who were not fathers and not divorced were included. As a result, there remained a total of thirty-six married players (the age at which they married was mean/SD = 27.06/2.30 years, range 20–30 years old).

As a control group, each of these thirty-six married players was randomly matched to an unmarried player of the same age from the original dataset. As with married players, unmarried players for whom there was incomplete/unreliable information, or who became fathers either before or during the data collection period were also excluded from the analysis.

In order to calculate the effects of marriage on performance, the total end of year ranking points were used for both the first full calendar year before and after marriage (e.g. if a player married in 1999, the ranking points for 1998 and 2000 were used). For an explanation of how the ATP rankings are calculated, go to www.atptennis.com. The ranking points for the same years were also taken for the unmarried player in each pair. The difference in ranking points between these two years was analysed separately for married and unmarried players.

Furthermore, as well as overall ranking points, each players' percentage of professional matches won in ATP tournaments was calculated for each year as a dependent variable.

RESULTS

There was no significant difference between unmarried and married players in ranking points for either the year before (MANN-WHITNEY test: $Z = -0.214$, $N_1 = 36$, $N_2 = 36$, $p = 0.831$, $r = 0.036$) or the year after (MANN-WHITNEY test: $Z = -0.941$, $N_1 = 36$, $N_2 = 36$, $p = 0.347$, $r = 0.16$). However, married players suffered a significant decrease in ranking points between the corresponding years (Wilcoxon signed ranks test: $Z = -3.095$, N-ties = 36, $p = 0.002$, $r = 0.52$) whereas there was no such difference in performance for unmarried players (Wilcoxon signed ranks test: $Z = -1.194$, N-ties = 36, $p = 0.232$, $r = 0.2$). These results are represented in *Figure 1*.

Similar results were found for players' winning percentages. Again there was no significant difference between married and unmarried players in winning percentage for either the year before (MANN-WHITNEY test: $Z = -1.063$, $N_1 = 31$, $N_2 = 31$, $p = 0.288$, $r = 0.19$) or the year after (Mann-Whitney test: $Z = -0.514$, $N_1 = 31$, $N_2 = 31$, $p = 0.607$, $r = 0.09$). Once again though, married players suffered a significant decrease in winning percentages between the corresponding years (Wilcoxon signed ranks test: $Z = -3.065$, N-ties = 30, $p = 0.002$, $r = 0.56$) whereas there was no such difference in performance for unmarried players (Wilcoxon signed ranks test: $Z = -0.941$, N-ties = 31, $p = 0.347$, $r = 0.17$). These results are represented in *Figure 2*.
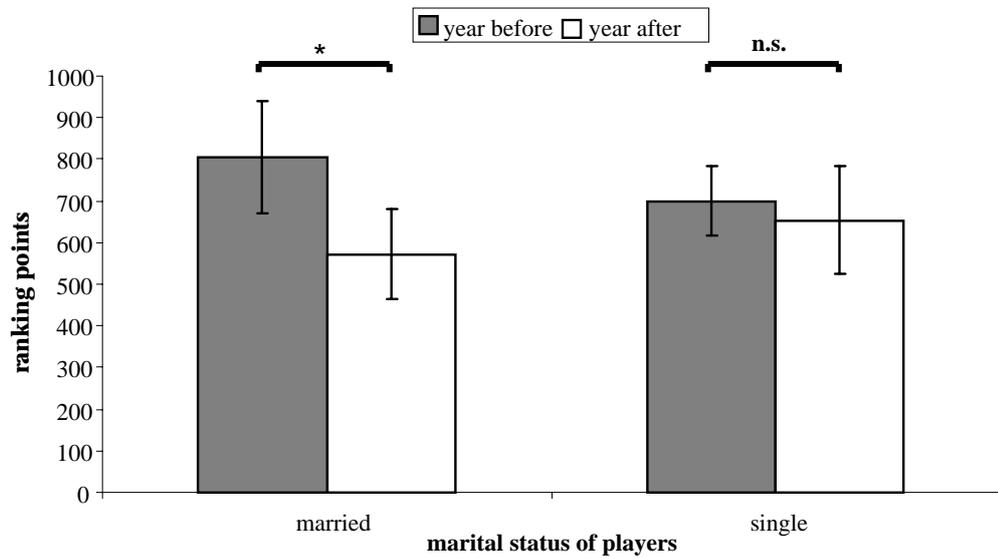
Figure 1. Mean ranking points (± s.e.m.) of married players the full calendar year before and year after their marriage, and of a matched control group of single players of the same age for the corresponding years. * indicates a significant difference between the two years (p < 0.005). n.s. indicates a non-significant difference
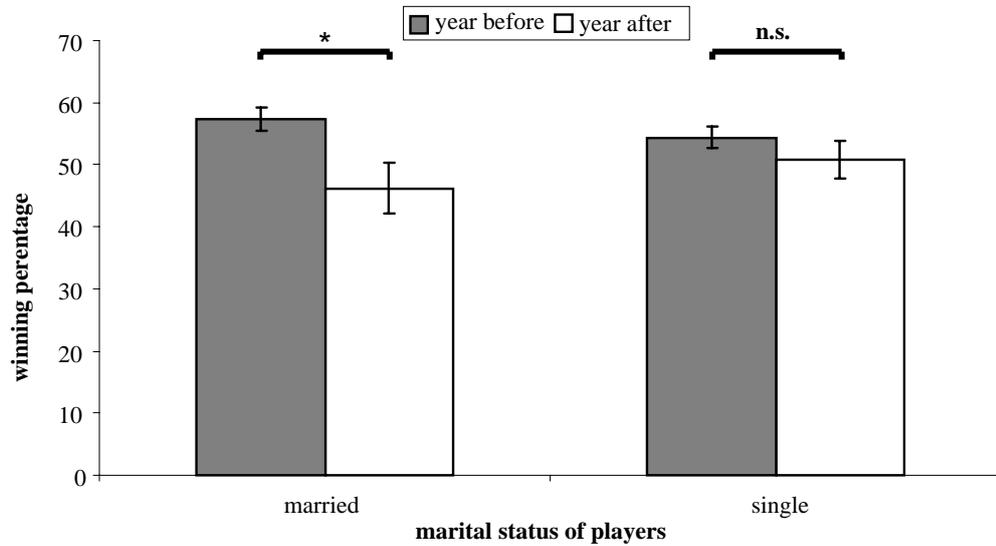

Figure 2. Mean winning percentages (± s.e.m.) of married players the full calendar year before and year after their marriage, and of a matched control group of single players of the same age for the corresponding years. * indicates a significant difference between the two years (p < 0.005). n.s. indicates a non-significant difference

DISCUSSION

As predicted, players' ranking points significantly decreased from the year before their marriage to the year after, whilst there was no such effect over time for the age-matched unmarried players. It seems likely that this effect was due to the evolved psychological mechanism that leads such players (albeit unconsciously) to devote less time and effort to competition and more to married life (KANAZAWA 2003). This mechanism may manifest through practical issues such as less time for practice, longer recovery from injury and personal distractions. Indeed, further support for the role of such a mechanism comes from the age range of the sample (20–30 years old). This closely mirrors the age range most synonymous with male cultural displays in other domains, such as jazz music (MILLER 1999).

Also, the lack of any difference in either measure between married and single players for either the year before or the year after suggests that these two groups did not differ in ability levels. This means any such differences in terms of overall ability between the groups cannot account for the observed differences in performance between married players as compared to single players.

It is worth noting that although there was no significant effect within the unmarried sample, the observed effect sizes were small to medium. We believe that this was mainly due to the increase in age, as the average age of unmarried players in the year after in our sample was 28 whereas the average age of players in the top 200 as of June 2007 was 25. Such effects of age were also present for married players, but we feel only partially contributed to the large effects sizes observed in this group.

However, there are other possible proximate explanations for married males drop in performance. One such explanation is that married players may not have decreased motivation to compete, but are less able to commit to participating in tournaments around the world. Therefore their reduced performance is due to them playing in fewer matches. This does not seem to be the case though, as the results show that their winning percentage also decreases. This suggests that it is more than just practical issues that lead to decrease in performance (such as travelling less, spending more time at home and other distractions), as their success in actually winning matches also decreased.

A possible biochemical basis for this behavioural adaptation is fluctuating levels of testosterone (T), as suggested by KANAZAWA (2003). Indeed, there is robust evidence that when a male's mating strategy shifts from acquiring mates to maintaining them (i.e. following marriage), his T levels will drop. This has been shown among married males (GRAY et al. 2002; GRAY et al. 2006; MAZUR and MICHALEK 1998) and males in long-term committed relationships (BURNHAM et al. 2003; GRAY et al. 2004). An explanation for this is given by the Challenge hypothesis (WINGFIELD et al. 1990), which states that T levels mediate the trade-off between parenting and mating effort in males. Also, It is known that performance in tennis is positively influenced by T levels (BERGERON et al. 1991; BOOTH et al.

1989). Of course, such proposed links here between differential sporting performance and T levels are only speculative, and will remain so until relevant data on actual T levels becomes available.

A possible limitation of this study was that there was no clear information about the individual mating status of the unmarried sample (i.e. whether they were single or in a relationship). Indeed, previous research suggests that decreased T levels can result from other long-term, committed relationships and not just marriage (e.g. BURNHAM et al. 2003). If there were a number of unmarried players in this sample who were in such relationships, then this may have contributed to the (non-significant) small to medium effect sizes found. However, this limitation would of course have no influence on the significant decrease in sporting performance of married players, where the effect sizes were large.

It would be interesting to examine how divorced players performed, compared to both their previous 'married' and 'unmarried' rankings, as this may possibly lead to a reversal of the motivational shift. As a result, performance would be predicted to rise again, as such males strive to again compete for potential mates. Empirical evidence on male T levels would also predict this, as divorce is associated with a subsequent rise in T levels (BOOTH and DABBS 1993; MAZUR and MICHALEK 1998). Unfortunately, we found very few players who divorced during their playing careers. Also as previously mentioned, fatherhood may lead to a decrease in the output of cultural displays (KANAZAWA 2000), and also further suppresses T levels (BURNHAM et al. 2003; GRAY et al. 2002; GRAY et al. 2006) and it would also be interesting to see the effect of this on tennis performance. Again, a lack of sufficient data on fatherhood prevented this in the current study, but future studies that examine this will hopefully shed further light on the role that social and familial status has on sporting performance.

A question arising from this research is how marriage affects female players' performance. We were unable to analyse this as the number of married female players was too small, possibly because females retire at an earlier age than males. Therefore further larger-scale examinations of marriage and sporting performance should aim to analyse effects on female performance as well.

Furthermore, it would be of great interest to analyse the effects of marriage on male performance in other solo sports. If as is suggested here there are evolved mechanisms that reduce competitiveness in married males, then we should find similar results to those here in other sports such as running, skiing and golf. Consequently, solo sports that vary in how much they possibly rely on T levels (such as boxing and chess) may also be investigated in an attempt to explore the role of T levels in this mechanism.

This study has provided further evidence that males experience a decrease in motivation to engage in competitive behaviours following marriage, and we are the first to show such an effect in sporting performance. It therefore suggests that there is some truth in the belief common in the tennis community that marriage is not good for players' careers (an example of this is Pete Sampras declaring in 2001 that

enjoying his married life had led to a decreased desire to win). The evidence here shows that this effect is real and suggests it has evolutionary origins, with varying T levels a possible biochemical explanation.

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