

## Writers Have Groupies, Too: High Quality Literature Production and Mating Success

Benjamin P. Lange

University of Kassel and University of Göttingen

Harald A. Euler

University of Kassel

Literature production may be shaped by sexual selection because most books are produced by men of reproductive age. However, the actual fitness benefit of world-class literature production has not as yet been documented. We hypothesized that the quantitative and qualitative literary output of famous writers would correlate with their number of mates, children, and grandchildren. We further assumed that writing lyric poetry would be more beneficial for mating success than nonpoetry because the former consists of more verbal handicaps (e.g., rhymes) than the latter and thus requires special literary competences. Literary quality and success were operationalized by the number of writers' entries in 2 noted literary canons from Germany and the United States. The writers listed in these canons were biographically researched for their mating successes. Literature production was correlated with number of mates. German but not American lyric poets had more mates than other writers. Previous findings that most literature is produced by men of reproductive age were replicated. The data supported the assumption that literature production is influenced by sexual selection (the process driven by differences in mate choice) and not just the result of natural selection (the process driven by differential survival and reproduction) or a cultural phenomenon.

*Keywords:* creativity, literary Darwinism, mating success, verbal proficiency, sexual selection

The evolution of art, and thus of literature, has been explained by natural selection (Dis-sanayake, 2000), because it might have helped our ancestors to survive, or as an evolutionary byproduct of the mind's architecture (Pinker, 1997). As has been observed, the subject matter of literature deals with topics that are highly

relevant to survival and reproduction (e.g., Carroll, 2005; Cox & Fisher, 2009; Gottschall, 2005; Nettle, 2005; Scalise Sugiyama, 1996, 2001; Wilson, 2005), indicating that natural selection (the process driven by differential survival and reproduction) and sexual selection (the process driven by differential reproduction via mate choice) might have shaped some aspects of the human capacity for art, at least indirectly. However, art does not necessarily have to deal with evolutionarily relevant topics in order to qualify as being the result of natural or sexual selection. Some approaches have suggested that sexual selection might have shaped literature production directly through epigamic behavior that attracts mates (Miller, 1999, 2000a). This hypothesis, which accords with recent research on creativity in general (Griskevicius, Cialdini, & Kenrick, 2006; Haselton & Miller, 2006), was adopted in the research reported here.

A writer may display his or her mental abilities by telling stories and thus serve his or her fitness interest through mate attraction. The language use in literature seems to be in accor-

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Benjamin P. Lange, Institute of Psychology, Department of Human Sciences, University of Kassel, Kassel, Germany, and Institute of Medical Psychology and Medical Sociology, Center of Psychosocial Medicine, Faculty of Medicine, University of Göttingen, Germany; and Harald A. Euler, Institute of Psychology, Department of Human Sciences, University of Kassel.

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Correspondence concerning this article should be addressed to Benjamin P. Lange, Institute of Medical Psychology and Medical Sociology, Center of Psychosocial Medicine, Faculty of Medicine, University of Göttingen, Waldweg 37, D-37073 Göttingen, Germany. E-mail: [benjamin.lange@med.uni-goettingen.de](mailto:benjamin.lange@med.uni-goettingen.de)

dance with sexual selection theory, because figures of speech, rhymes, and meter qualify as handicaps (Locke & Bogin, 2006; Miller, 2000a; Turner, 1999) in the Zahavian sense (Zahavi, 1975). Verbal art or any creative writing is usually ambiguous, complicated, difficult to understand, and even more difficult to produce, and may thus be an indicator of high intelligence. The playfulness of verbal art, exemplified by diverse vocabulary, may even signal youth and health (Miller, 2000a, 2000b). Indeed, high verbal proficiency is a prerequisite for world-class literature production and qualifies for a sexually selected display (Rosenberg & Tunney, 2008). Hence, producing literature, which is a much younger trait than language, might be one specific and relatively new manifestation of our at least partially sexually selected cognitive structures, which include our evolved capacities for syntactical language (Miller, 1998, 2002). Studying the evolution of literature might thus lead to new insights into the evolution of language.

The production of literature consumes time, which is a limited resource required for various kinds of life efforts other than writing, like somatic, direct mating as well as parental and extraparental nepotistic effort (Alexander, 1987). Moreover, the production of literature is time consuming, and so is the acquisition of literary competence, which might include explicit literary training. A writer must also have the energy, motivation, and endurance to finish his or her work. Wishbow (1988) and Kaufman and Kaufman (2007) have shown that poets need about one decade of preparation before a major literary contribution can be achieved (cf. Simonton, 1997, 1999). This surplus of resources is not available to everybody, which thus helps separate the wheat from the chaff (Simonton, 1999) because fitness-relevant qualities have to be judged, and differences among individuals make judgments easier.

According to sexual selection theory (Darwin, 1871; Trivers, 1972), men, the sex with higher reproductive variance, should be more prone than women to producing literature in order to succeed in intersexual and intrasexual selection, while women preferably consume literature. There is already some evidence for the existence of this sex-specific principle of supply and demand, as men seem to be more prone than women to write (Lange, 2011; Miller,

1999). Men are the ones who tell stories in a competitive manner (Locke & Bogin, 2006; Scalise Sugiyama, 1996) and who dominate public performances of verbal art, and they start doing so around puberty, whereas women cross-culturally are those who judge such displays (Locke & Bogin, 2006). Women, more than men, like to read and actually read more (Garbe, 2002).

There were and are numerous successful female writers. One might, for instance, think of Jane Austen. Even apart from such modern writers from a Western culture, examples can be found. Beatriz de Dia, for instance, was a very famous female troubadour in the medieval Mediterranean area. But despite these examples, the production of literature seems to be dominated by men (Miller, 1999).

Sexual selection theory would predict not only that the majority of literature is produced by men, but also that it is produced mainly by men of reproduction-relevant age. In a sample of English-language books published in the 20th century, Miller (1999) found an overrepresentation of men with an age peak of about 40 years. A nonbiological explanation of literature would have to assume that literature is produced (a) equally by men and women, given equal access to the required resources, and (b) at an older age because of more time spent in acquisition of competence.

A male-biased gender gap and an age peak at 30 to 40 years, with a slow decrease thereafter, have also been reported for other cultural phenomena like music, science, painting, and the foundations of religions (Euler, 2004; Hayes, 1989; Kanazawa, 2000; Miller, 1999; Sternberg & Lubart, 1991). This decrease can be expected when linking the motivation for such activities to the effects of testosterone as a major proximate mechanism for male assertiveness and thus male displays, because testosterone in men shows a similar decline with age (Dabbs, 2000). This pattern found for several cultural phenomena is similar to the pattern of other phenomena that are likely sexually selected, such as physical violence among young men (Miller, 1999; cf. Kanazawa, 2003), except for the fact that homicides occur at a younger age than writing literature, probably because for high-quality writing a longer time for competence acquisition is needed (Wishbow, 1988).

Miller's (1999) finding about the predominance of relatively young male writers constitutes only indirect evidence for literature production under the influence of sexual selection. Direct measures of fitness benefits would provide a stronger argument, as Miller himself admitted (p. 73). To our knowledge, only Nettle and Clegg (2006) have shown that, in a sample of contemporary creative persons, including poets and artists, the amount of engagement invested in the creative activity was associated with the number of mates, although the number of children was not. That mating success did not translate into number of offspring is not surprising in a contemporary sample, given the availability of effective birth control (Pérusse, 1993). Because Nettle and Clegg (2006) did not account for the quality and the actual success of the creative activity, our study tried to fill this gap with data based on the following hypotheses.

*Hypothesis 1:* The more high-quality literary works men of the recent past have produced, the more mates, offspring, and grand-offspring they would have. The highest correlations were expected for the number of premarital and extramarital relationships, because these relationships can be seen as a realization of the effective male strategy to maximize mates (Trivers, 1972). In comparison, at best weak correlations would be expected between the number of high-quality literary works and marriages, because socially imposed monogamy and divorce restrictions limit the number of wives. Therefore, the total number of female mates can be considered the best proxy for a man's reproductive fitness.

*Hypothesis 2:* The handicap principle (Zahavi, 1975), applied to literature production, would suggest a differential prediction for certain genres of literature (Miller, 2000a). Poetry might be a stronger handicap, and therefore be more difficult to fake than nonpoetry—thus being a more valid fitness indicator than nonpoetry. The poet—apart from possessing a good command of grammar and vocabulary—must obey rules of meter and rhyme. Rhyme, in particular, limits the number of potential words available for use, which is a pro-

found way to demonstrate a large vocabulary (Miller, 2000a; but see Simonton, 1975, p. 263, who has assumed that prose “seems to impose more lexical and syntactical demands” than poetry). Vocabulary has a high heritability (Bratko, 1996) and the potential to be a fitness indicator (Rosenberg & Tunney, 2008). Writers who have also produced lyric poetry would have more mating success than pure novelists or playwrights. As with our first hypothesis, the mating advantage of poets over other writers might best be operationalized as the number of premarital and extramarital reproductive partners. Additionally, to bolster Hypothesis 2, the lexical diversity of poetry compared with nonpoetry was quantified. We also expected to replicate Simonton's (1975) finding that lyric poets lived shorter lives and published their first work earlier than pure novelists or playwrights. Simonton explained this difference between writers of different genres by claiming that poems are more emotional than other forms of literature, which fits young writers better than older ones.

## Method

Literary quality, like any creative quality, is difficult to measure objectively (Simonton, 1997). As an available approximation, the listing of writers and literary works in two acknowledged literature canons was used. The first canon was German and compiled in 2001 by Marcel Reich-Ranicki, Germany's most famous and highly respected literary critic (see Wikipedia, n.d., for an overview of the entire list of works). In this canon, Reich-Ranicki named writers and those of their works that, in his judgment, were worth reading and characterized by high literary quality. Although Reich-Ranicki's canon goes back as far as German medieval literature, only 18th-, 19th-, and 20th-century writers were selected for the current study, because sufficient biographical information about the mating success of writers from earlier times was too difficult to obtain. The final list consisted of 161 entries by 69 writers. The second data source was the Western canon by American literary critic Harold Bloom (1994), from which the 20th-century American

writers and their works were considered, resulting in 374 entries by 161 writers. The sample size was thus large enough that writers from earlier centuries did not need to be considered. For both lists, the number of entries for each writer varied considerably, ranging from one to eight for the Germans ( $M = 2.36$ ,  $SD = 1.42$ ) and from one to nine for the Americans ( $M = 2.33$ ,  $SD = 1.35$ ;  $Mdn_s = 2$ ). The entries for both lists were skewed considerably right (skewness  $> 1.7$ ).

Literary quality and success were operationalized as the number of entries. The use of this operationalization is supported by the observation that quantity and quality are associated with each other (Simonton, 1989a). Some writers did not enter the respective canon with a specific work but with unspecified poems or short stories in general. Those unspecified entries in plural were counted as two.

Two different canons were used to increase reliability on the assumption that no major differences existed between German and American writers with respect to the hypotheses. Although both canon compilers are highly erudite men, an entry bias for or against our hypotheses seemed unlikely. Reich-Ranicki, for example, has appeared on numerous television programs, including literary talk shows, and none of us has ever heard any allusion by him to evolutionary perspectives, let alone specific allusions to literary production under sexual selection. We, therefore, consider both compilers to be hypothesis-blind.

The biography of each writer in the canon was researched for (a) age at death, (b) age at which each work was written, and (c) male writers, the number of marriages, affairs, romances, girlfriends, offspring, and grand-offspring that were mentioned anywhere in any of our biographical sources.

The biographical research on mating success was undertaken according to the following protocol: Internet research using the Wikipedia site of each writer was the starting point. Then, in Google, the writer's name was combined with the following key words: *marriage*, *affair*, *romance*, *girlfriend*, *child*, *children*, *grandchild*, *grandchildren*, *son*, and *daughter*. For each writer, the first 10 search results were examined. Third, the most up-to-date biography for each writer was consulted. Finally, two experts on each writer (i.e., literary scientists, biographers,

and historians) were contacted by email and asked to name all known reproduction-relevant successes and to clarify cases of doubt. Each expert was provided with a list of all mating successes found by the first author for the respective writer and asked whether this list was correct.

One objection to our method could be that the more famous a writer is, the more likely it is for him to have many entries in a literary canon (or vice versa). And the more famous a writer is, the better studied his personal life is. And the better studied a writer's personal life is, the more mating successes can be found when conducting biographical research. To counter this possible objection, it should be emphasized that, for all writers, the same procedure and amount of biographical research was conducted. Especially, if taking the German list as an example, it gets clear that the 64 male writers in it represent the prime quality of German literature of the past three centuries and are, thus, probably equally well studied. Our experience during the biographical research was that, for no writer, was gaining the desired information particularly problematic. We were, however, aware that the mating and reproductive success of each of the writers might be a conservative estimate, because not all relationships would have been documented or known. If a writer has, for instance, a very brief affair that remains confidential, then it could not be investigated. But this condition would apply equally to all writers.

## Results

### Sex Differences in Writing Literature

Figure 1 (a) shows the age distributions of both sexes with respect to German canon entries. Replicating Miller's (1999) findings, 92.8% of all writers in the German canon and 93.2% of all entries were male. For the 20th-century section of the German list, the male share was somewhat lower, with 88.9% of the writers being male and 89.3% of all entries concerning male writers. The mean age of male writers ( $n = 64$ ) in the total German list at the time of publication of their first work, as listed in the canon, was 30.9 years. Half of the writers (interquartile range) were between 24.0 and 34.5 years old when their first published work appeared. For all works in the canon, the mean

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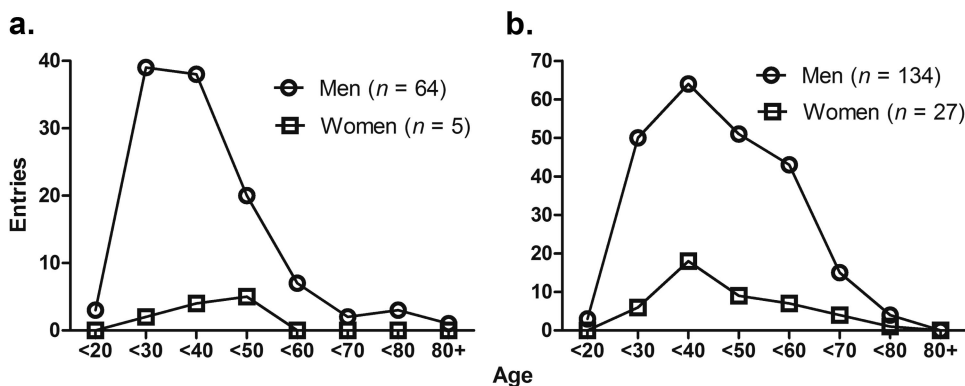


Figure 1. Number of entries by age and sex of the writers in the German literary canon (a) and in the American canon (b).

age was 35.9 years. The female ( $n = 5$ ) age peak was higher than that of the male: 35.4 years for the first work and 37.3 years for all works in the canon.

In the American list (see Figure 1b), 83.2% of all writers were male and 84.2% of all entries dealt with male writers. The mean age of male writers ( $n = 134$ ) at the time of their first published work, as listed in the canon, was 35.5 years work. Half of the writers were between 27 and 42 years old at the time of first publication. For all works in the canon, the male mean age was 40.6 years. The female ( $n = 27$ ) mean age was 37.6 years for the first work and 41.5 for all works listed in the canon.

**Hypothesis 1: Success as a Writer Is Associated With Mating Success**

The correlation coefficients between markers of literary success and those of mating and

reproductive success for male writers are shown in Table 1. Life age could mediate the relation between number of entries and number of mates, because the higher the age, the more mating and reproductive successes as well as canon entries are possible (cf. Simonton, 1997). Indeed, in the German list, life age correlated positively with number of marriages ( $r = .34, p < .03$ ) and number of children ( $r = .34, p < .04$ ). In the American list, the number of children correlated positively with life age ( $r = .28, p < .02$ ). Hence, life age was controlled for in the statistical analyses. To make a comparison possible between the American and the German lists, data from the 20th-century section of the German list are given separately.

The distributions for the entries of both canons were skewed considerably to the right, which might have biased our results to some degree, because only a small number of writers

T1

Table 1  
Partial Correlation Coefficients (Two-Tailed) Between Number of Male Literary Canon Entries (Original Data/Logarithmically Transformed Data) and Number of Mating Successes, Controlling for Age

Mating success	German list, 18th to 20th century ( $N = 64$ )	German list, only 20th century ( $n = 36$ )	American list, 20th century ( $N = 134$ )
Marriages	-.24/-.27 ( $n = 43$ )	-.09/-.14 ( $n = 25$ )	.05/.12 ( $n = 101$ )
Affairs, girlfriends, and romances	.57***/.53** ( $n = 35$ )	.73***/.66** ( $n = 19$ )	.47**/.46** ( $n = 37$ )
No. of mates <sup>a</sup>	.38**/.34* ( $n = 52$ )	.64***/.51** ( $n = 31$ )	.55***/.52*** ( $n = 102$ )
Children	.28/.21 ( $n = 34$ )	.23/.15 ( $n = 18$ )	-.20/-.20 ( $n = 79$ )

Note. The values in parentheses are the number of cases for which information was available.

<sup>a</sup> Total score of marriages, affairs, girlfriends, and romances.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .



achieved up to eight or so canon entries. And these few writers might have been the ones who, in particular, had many mates. Hence, to avoid such a bias, we conducted a logarithmic transformation on the canon entry data to create normal distribution. Table 1 shows the results obtained by using the original canon entries data and the logarithmically transformed data.

F2 Figure 2 shows the scatterplot with regression lines of the correlation between canon entries and number of mates.

The correlations between canon entries and number of grandchildren for the total German list, the 20th-century section of the German list, and the American list were all positive, but none was statistically significant.

**Hypothesis 2: Writers of Lyric Poetry Had More Mating Successes Than Other Writers**

First, the differences between poets and nonpoets with respect to age at first canon entry and to age at death were investigated. In the total German list, poets published their first work at 26.15 years of age compared with 34.21 years for nonpoets,  $t(62) = 3.80, p < .001, d = 0.97$ . In the American list, poets also published their first work earlier than nonpoets (31.66 vs. 38.89 years of age),  $t(113) = 3.74, p < .001, d =$

0.70. In all lists, poets lived shorter lives on average than other writers (total German list, 58.42 vs. 61.82 years; 20th-century German list, 62.85 vs. 64.96 years; American list, 71.36 vs. 72.73 years), but none of the differences were statistically significant.

Our second hypothesis was that poets have more reproductive partners than nonpoets, based on the assumption that poetry might be a larger linguistic handicap than prose or drama and might thus be a more valid fitness indicator. A measure for the extent of a mastered linguistic handicap on a lexical level is the type-token ratio (TTR), which indicates lexical diversity. The TTR has proven useful in distinguishing literary texts of varying aesthetic success, artistic creativity, and popularity (Simonton, 1989b, 1990, 1998). It is calculated by dividing the number of different word forms (types) by the number of all words (token) (Kemper & Sumner, 2001). A sample of texts from the German canon was chosen from writers who entered the canon with both poetry and nonpoetry. Two prose works and two lyric works from the German canon of 18th-century classical writer Schiller and two prose works and two lyric works of 20th-century writer Brecht (author of *The Threepenny Opera* and a notorious womanizer) were randomly selected and then exam-

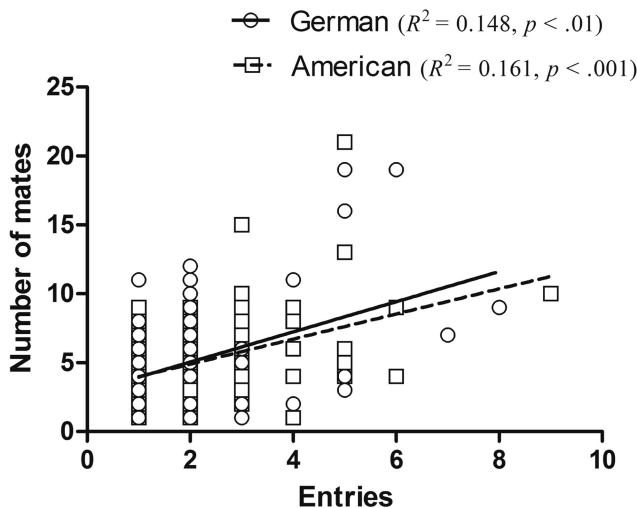


Figure 2. Scatterplots with regression lines showing the associations between number of canon entries and number of mates (total score of marriages, affairs, girlfriends, and romances).

ined. Thus, four works of lyric poetry were compared with four works of prose. The first 100 words from each work were used to calculate the TTR. All four lyrical texts had higher TTRs (range: .77–.84,  $M = .80$ ) than any of the four prose texts (range: .70–.75,  $M = .72$ ) and were, hence, lexically more diverse.

As to the differences between poets and non-poets with respect to number of mates, a confirmatory result was found only in the German list. Poets on that list had a significantly higher total score of affairs, girlfriends, and romances ( $M = 4.14$ ,  $SD = 3.48$ ) than nonpoets ( $M = 2.13$ ,  $SD = 1.6$ ). After statistically controlling the variable “canon entries,” because poets had slightly more canon entries ( $M = 2.6$ ,  $SD = 1.5$ ) than nonpoets ( $M = 2.2$ ,  $SD = 1.46$ ; ns), the difference between poets and nonpoets with respect to number of mates was no longer statistically significant, but it was still moderate in effect size,  $F(1, 35) = 3.79$ ,  $p = .06$ ,  $\eta_p^2 = .098$ . For the American list, there was no significant difference between poets and nonpoets with respect to number of mates.

## Discussion

Miller’s (1999) findings for writers of books could be replicated, because most works were written by men of reproduction-relevant age when mating effort is most important and when individuals are subjected the most to sexual selection pressures. Competence or wisdom with increased age is a negligible factor, not only in literature production, but also in music, painting (Miller, 1999), and science (Kanazawa, 2000).

Could it be that most works were produced between the ages 30 and 35 and not at a later age simply because one is more likely to be alive at age 35 than at age 70 (Dennis, 1966)? Three findings speak against this argument: (a) Taking male German writers as an example, mean life expectancy was 60.4 years, which is substantially higher than mean age for literature production, which was 35.9 years. (b) The age distribution for literature production and that for life expectancy were skewed in the opposite directions, with literature production being skewed right (see Figure 1). (c) When comparing writers who lived more than 60 years with those who died earlier, no statistically significant difference was found between publication

ages. This means that, irrespective of age at death, most works were produced at a young age; that is, even those writers who reached an older age had their first major literary impact when they were relatively young.

Gender theorists usually claim that the sexual dimorphism regarding the production of literature has no biological foundation, but rather is a pure cultural phenomenon caused by restrictions, most notably the three Ks (*Kinder*, *Küche*, and *Kirche*), imposed on women by men, leaving little room for women’s writing ambitions (e.g., Battersby, 1994; Russ, 1997). Another restriction, namely, that most if not all societies of past centuries used to frown on women’s writing ambitions, could have been even more severe. Aramena, an 18th-century female writer, once stated that it was a dangerous thing for a lady to write books (Metzger & Schade, 1988). Still, in 19th century, women seemed to have suffered from such restrictions, as Mary Anne Evans, one of the most important writers of English literature, might demonstrate, because she adopted a male pen name (George Eliot) when writing her works.

The claim that societal structures hindered women’s efforts to write is, hence, justified, but, in our judgment, tells only part of the story. We acknowledge that it was not until the latter part of the 20th century that female writers started to proliferate, probably due to changed social environments. Our results show that the percentage of female writers was higher for the 20th century than for previous centuries, although still small, which supports the argument that cultural restrictions might have played a part in that century as well. But the gender differences are too large to be entirely due to female workload or other restrictions. After all, 19th-century women did, for example, time-consuming embroidery apart from kitchen work and child care (Wheeler, 1921). Why did they not write poems and prose instead, one could ask, when they liked both literature and embroidery?

Indeed, several women, for instance in the 19th century, did write and must hence have been motivated to do so. But still today, men report being more motivated to write a book than women (Lange, 2011). Mere writing does not suffice, because publishing a literary work is crucial for having a literary display that can only then get in the scope of selection. Women in the course of history might have enjoyed

writing but were unable to publish their works, partly due to restrictions and probably also due to motivational factors. Men could have been much more motivated than women not only to write but also to publish their works. They, partially due to these motivational factors, might have just produced more books and thus more good ones than women (Simonton, 1999), which are then listed in literary canons.

Further, women are more avid readers than men (Garbe, 2002). So, even if societal structures historically prevented women from writing, it seems awkward to assume that the same structures forced women to buy and read books written by men. The pattern of male supply and female demand predicted by sexual selection theory seems to be a central part of the story and is supported by our data.

In support of the hypothesis that high-quality literature production is associated with mating success, we found, for both canons, several correlations between markers of literary success and quality, on the one hand, and mating and reproductive successes, on the other hand. As expected, this was less the case for marriages, whereas the highest correlations were found for number of affairs, girlfriends, and romances, because affairs are mating successes that best serve a male quantitative reproductive strategy.

According to our findings, literature production and consumption is embedded within the broad palette of mating behaviors throughout the animal kingdom. The more eyespots he has on his tail, the more mates a peacock has (Petrie, Halliday, & Sanders, 1991). The larger his song repertoire is, the more mates a male bird has (Hasselquist, Bensch, & von Schantz, 1996). Both the peacock's plumage and male bird songs qualify as fitness indicators following the handicap principle. Verbal art also seems to enhance mate number, qualify as a handicap, and—as a human universal—is as much species-specific for *Homo sapiens* (Brown, 1991) as singing songs is for many bird species.

We did not find noteworthy correlations between literature production and number of children. That access to reproductive partners does not regularly translate into number of offspring is a common finding in non-naturally producing societies. For example, Pérusse (1993) found in 20th-century Canada a correlation between male status and mating success, but not between

male status and number of children, presumably due to contraception and enforced monogamy.

As for factors mediating the relation between literary and mating success, we propose verbal proficiency as one candidate, because it is assumed to serve as a mental fitness indicator (Miller, 2000a). Language is a prerequisite for all forms of literature. And there is some evidence that language was and is under sexual selection (e.g., Burling, 2005; Locke & Bogin, 2006; Rosenberg & Tunney, 2008). Therefore, for any literary display, language might be the main trait objected to selection. Evolutionary approaches to literature could hence help in understanding the evolution of language (Scalise Sugiyama, 1996, 2001). However, our results on the difference between poets and non-poets (Miller, 2000a) were ambiguous. Still, we could show that, at a lexical level, poetry might be a larger handicap than nonpoetry, adding more evidence to the supposition that language plays a decisive role in producing literature that subsequently helps in attracting mates.

The observations that poets die younger, produce their works earlier, have—at least by trend—more mates than nonpoets, and that poetry constitutes a larger verbal handicap than prose could lead to the hypothesis that poets are relatively more quantitative strategists and, furthermore, have higher levels of testosterone than nonpoets. Testosterone could be one major proximate mechanism behind the (male) motivation for literary displays. Of more import here, testosterone has negative effects on longevity (Min, Lee, & Park, 2012) and correlates positively with number of sexual partners (Booth, Johnson, & Granger, 1999). In line with this, it could be that poets show higher extraversion, sensation seeking, and risk-taking propensities than other writers. Extraversion and sensation seeking correlate with a rather unrestricted sexual behavior (Penke & Asendorpf, 2008) and, thus, potentially with mate number. High extraversion, sensation seeking, and risk-taking propensities are also associated with high levels of testosterone (Roberti, 2004). Lyric poetry in particular is assumed to be an activity that does not offer huge monetary rewards and is thus risky, which might go along with a sensation-seeking propensity. Indeed, there is some evidence that poets differ from nonpoets in terms of personality (Post, 1996). Poets are, for instance, relatively prone to substance abuse



and mental illness (Jamison, 2003). Substance abuse also seems to be associated with high levels of testosterone (Booth et al., 1999). This could mean that differences between poets and nonpoets regarding mate number are not necessarily caused by poetry being verbally more creative. Thus, people who produce world-class poetry might differ from other writers from the start. Even within a genre, there might be differences between certain writers, because one poet might prefer to write about love, which helps attracting mates, while another poet writes mostly about the fatality of life, which might scare off potential mates.

Another factor mediating the relation between literary and mating success could be social prestige acquired by means of writing. So, it might be that specifically literary qualities are not responsible for high achieving writers having more mates than less successful writers, but the status gained from writing. However, without certain literary qualities, including high verbal proficiency, it is impossible to become a world-class writer. Hence, because world-class writing is associated with number of mates, literary qualities are in the scope of selection after all, at least indirectly. Future research should further elucidate the interrelations between testosterone, status, personality factors, verbal creativity, mating success, and literary genre.

Alternative, that is, nonbiological, explanations for our findings come to mind. Literature is a complex trait that is always embedded within a certain culture that influences the way literature is produced. Specific patterns, for example, the use of special forms of meter in poetry or very special literary content (e.g., the dehumanization of the individual by an engineered world in expressionistic writings) that result from certain zeitgeist cannot be explained by basic biological factors. With respect to social prestige, we must acknowledge that such cultural factors might influence a writer's reputation and, thus, his mating success. Possibly, one cannot even totally rule out that literature is merely cultural after all and that the mating successes of writers are just byproducts of the social prestige gained from writing.

Even within biological explanations, sexual selection theory is not the only plausible explanation for the existence of literature, because the process of natural selection might have also

shaped the human capacities for literature, as mentioned in the introduction. Hence, we do not claim that sexual selection entirely explains human literature, but our findings from two cultures that most literature is produced by men of young age and that the quantity of literature production correlates with the number of reproductive partners sit comfortably alongside approaches claiming that mate choice is at least one factor in the evolution of art in general and literature specifically. Still, we concede that we investigated only writers from two cultures within a short time period. Thus, our results may not be representative of the literature production of all human cultures. Hence, replicating our research in other, preferably non-Western cultures is desirable.

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