Male-female ratio in waking-life contacts and dream characters

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Summary. One of the well established findings in dream research is the discrepancy between men's and women's dream character sex ratio, i.e. men dream more often about men but women show no such difference. Several studies suggest that this discrepancy is not ubiquitous because, for example, a person's relationship status alters these rates. The present study investigated the relationship between the sex ratio of dream characters and waking-life social contact patterns. Sixty-one participants kept a dream diary for two weeks as well as a daytime diary to thoroughly record all waking contacts in terms of duration and number of characters. After the two weeks all participants had to fill out a retrospective questionnaire about their contact patterns in the inquiry period. Both genders spent an equal amount of their waking time with men (female participants 41%, male participants 43%) and generally more time with women. Looking at the dream reports, men reveal more male characters (61%) than women (48%) but this difference barely missed significance (p = 0.0731; d = 0.518). We separated the female participants into singles and non-singles and calculated male ratios for both subgroups respectively to look for factors other than gender that may influence the ratio. Daytime prospective measures reveal that women in a relationship spent twice the time with men (50%) compared to singles (26%). Furthermore, female participants in a relationship, dream significantly more about men (54%) than those without a partner (36%). Results suggest that there are other factors than gender per se contributing for the different male ratios in women's compared to men's dreams.

Keywords: Dream content, gender differences, continuity hypothesis, social contacts, male/female percent

1. Introduction

The continuity hypothesis of dreaming postulates that waking-life concerns and experiences influence our dream content (Hall & Nordby, 1972; Domhoff, 1996; Schredl, 2008). In terms of gender differences, one of the main findings of Hall and Van de Castle (1966), that men dream more often about men (67%) than women (33%) but women showed no such differences (48% male and 52% female dream characters), was replicated several times (Hall & Domhoff, 1963; Hall, Domhoff, Blick & Weesner, 1982; Hall, 1984; Schredl, Sahin & Schäfer 1998, Domhoff & Schneider, 2008). There are different explanations for these findings and only a few studies investigated whether these differences are due to the amount of time spent with men and women in waking-life or may reflect a ubiquitous dream pattern. Hall's (1984) explanation was that men are more preoccupied with males than with females. As a possible theoretical background the Oedipus complex was proposed since men are in rivalry to male figures (father) whereas women are not and, thus, men are more prominent in men's dreams. But current viewpoints based on the continuity hypothesis would predict that waking-life differences are underlying dream content disparities. The question is whether there are any factors affecting the gender ratio of dream persons. Schredl

(2001), for example, investigated this issue more precisely by showing that the ratio found by Hall and Van de Castle only applies for singles and not for participants in a relationship. Non-singles revealed a reversed gender ratio compared to the Hall and Van de Castle norms with 62.3% male characters in women's dreams and 48.7% male characters in men's dreams (Schredl, 2001), indicating that ubiquitous explanations like the Oedipus complex might not be valid. The moderating factor regarding the influence of relationship status on the gender of dream persons might be the increased time spent with the opposite sex when being in a relationship. Grey and Kalsched (1971) found a significant relationship between the time spent with the opposite sex in waking-life and the percentage of opposite sex figures in the dreams. Domhoff (1996) indicated though, that results of this study are limited by methodological shortcomings. Schredl, Loßnitzer and Vetter (1998) obtained a significant correlation between the sex ratio of dream characters and the sex ratio of social contacts but just for the last weekend. Schredl and Jacob (1998) found a small but significant difference in the percentage rates of male dream characters depending on their field of study: 63% male dream characters when studying in an environment consisting of 95% male students whereas only 51% of dream characters were men in a predominantly female environment (30% male students). Rinfret, Lortie-Lussier and De Koninck (1991) found that husbands were more frequent in dreams of wage earning mothers (who had a partner) than in those of single female students. Westbrook (1989) obtained similar findings by showing that men and women who were married for the first time and, therefore, engaged in a prolonged relationship dreamt more often about their partners. It has to be mentioned, however, that both studies (Rinfret et al., 1991; Westbrook, 1989) revealed no difference in the sex of the

dream characters. Hall (1984) reported results of a woman's dream series where the ratio of male characters decreased after moving in a retirement home with little contact to men in waking-life. Schredl, Schröder and Löw (1996) obtained comparable findings: widowed people generally dream less about their partners. However, dream character's gender patterns were not investigated in this study. Overall, the findings indicate that the ratio of male and female dream characters might be affected by the current waking-life social contact patterns of the dreamer.

The present study was carried out to test whether the gender-specific pattern of waking-life contacts is reflected by corresponding gender differences in dreams. Compared to the above mentioned studies a more comprehensive way of measurement was used. In addition to account only for waking-life social contact patterns, the time someone thinks about another person as well as talked on the phone, or mailed on the internet, was also measured. It was hypothesized that a more detailed data collection results in stronger correlations between waking-life and dream content parameters, in a sense that a higher male to female ratio in waking-life contacts is reflected by a higher male to female ratio of dream characters.

2. Method

2.1. Participants

Overall, 61 students from the University of Mannheim participated in the study. All participants studied psychology except for one who studied social sciences. The sample consisted of ten male and 51 female persons with a mean age of 21.52 ± 2.84 yrs (range 19-34 yrs). There was no age differences between genders (male: 21.00 ± 0.82; female: 21.63 ± 3.09; $t(59) = -1.247$; $p = .218$). Overall 24 participants were singles and 34 in a relationship (3 participants provided no information on their relationship status).

2.2. Dream questionnaire

Participants were asked about their age, gender, field of study, relationship status, siblings and family members they grew up with, dream recall as well as nightmare frequency and mood of dreams in general. Dream recall frequency was assessed on a 7-point scale (Schredl, 2004) consisting of the following categories: 0 - never, 1 - less than once a month, 2 - about once a month, 3 - about 2-3 times a month, 4 - about once a week, 5 - several times a week or 6 - almost every morning. Nightmare frequency was assessed on an 8-point scale (Schredl, 2003) with the options: 0 - never, 1 - less than once a year, 2 - about once a year, 3 - about 2-4 times a year, 4 - about once a month, 5 - about 2-3 times a month, 6 - about once a week, 7 - several times a week. Mood of dreams in general was rated on a 3-point scale ranging from predominantly negative to predominantly positive.

2.3. Diary

Participants were instructed to keep a standardized diary for two weeks. The diary consisted of one similar sheet each day. In the evening, participants were asked to record the gender and duration (hours and minutes) of every person they were involved with that day regardless of whether it was direct contact, phoning or chatting or even notionally. The next morning, they had to indicate whether a dream was

recalled or not and if so, write it down. Afterwards positive and negative feelings of the dream were assessed on two 4-point scales each containing the categories: 0 = none, 1 = mild, 2 = moderate and 3 = strong feelings.

2.4. Social contact questionnaire

In order to get general information about waking-life contact patterns during the two weeks of the study, all participants had to complete an additional questionnaire regarding the number, sex and average time spent with roommates, close friends, remote friends and other people (not containing to any aforementioned group). We also included a category for indirect contact like phoning, mailing or thinking about others.

2.5. Procedure

Participants were recruited at the University of Mannheim. Participation was unpaid (but students received credit points necessary for their B.A.) and voluntary. No exclusion criteria were made. After all participants completed the dream questionnaire and the diary, they filled in the social contact questionnaire. The dream reports were typed, randomized and scored by an independent and blind judge. Scoring rules for male and female dream characters were adapted from Hall and Van de Castle (1966). This information was used to calculate the ratio of male contacts (number of male characters divided by the sum of male and female characters; cf. Domhoff, 1996) for both, waking-life and dream reports. Mean word count was used as a measure of dream length. Effect sizes are presented and interpreted according to Cohen (1992).

SAS software package for Windows 9.2 was used for statistical analysis. If not mentioned explicitly two-tailed statistical tests were applied with alpha = 0.05. Data was submitted to analyses of covariance. Contrasts were computed using t-tests. For ordinal scales ranks were analyzed. Degrees of freedom are presented in brackets following the F- and t-values.

Table 1. Number and time of waking contacts and dream characters for the total sample

Measures	Mean ± SD
Social contact questionnaire	
Number of male contacts	3.84 ± 1.88
Number of female contacts	5.68 ± 2.27
Time spent with men[1]	89.90 ± 73.53
Time spent with women[1]	160.21 ±117.29
Daytime diary	
Time spent with men[2]	3802.44 ± 3131.69
Time spent with women[2]	5101.07 ± 2996.52
Dream reports	
Male dream characters	3.79 ± 4.04
Female dream characters	3.90 ± 4.71

[1] Time data is provided in minutes per day

[2] Time data is provided in minutes (summed for two weeks)

Table 2. Male character ratios[1] for the total sample as well as female and male participants

Variable	Total sample	Female	Male	Group difference	Effect size
Social contact questionnaire[2]					
Number	0.40 ± 0.18	0.36 ± 0.14	0.61 ± 0.19	t(55) = 4.8; p < .0001	d = 1.674
Time spent	0.38 ± 0.21	0.37 ± 0.20	0.43 ± 0.26	t(55) = 0.9; p = .3953	d = 0.284
Daytime diary[3]					
Time spent	0.41 ± 0.21	0.41 ± 0.21	0.43 ± 0.20	t(59) = 0.3; p = .7729	d = 0.096
Dream reports[3]					
Number	0.50 ± 0.26	0.48 ± 0.24	0.61 ± 0.30	t(54) = 1.5; p = .0731#	d = 0.518

[1] Male character ratios were calculated by number of male characters divides by the sum of male and female characters, [2] Social contact question-naire: retrospective, [3] Daytime diary, dream reports: prospective, # One-tailed t-test

3.   Results

The 61 participants provided 323 dream reports. On average participants reported 5.3 ± 3.11 dreams (male: 4.30 ± 2.83; female: 5.49 ± 3.15; t(59) = -1.106; p = .273) with 54.73 ± 30.9 words (male: 58.91 ± 27.8; female: 53.91 ± 31.66; t(59) = 0.448; p = .656).

The means and standard deviations of the amount of time and the number of characters participants had contact with are depicted in Table 1. The total group not only spent more waking time with women than men but also had more female than male contacts. Data regarding participants' amount of waking contacts gathered by the daytime diary could not be included because participants often did not follow the instructions.

The next step was to look for sex differences in the dream reports as well as waking-life. We calculated the male contact ratios as described above following Domhoffs (1996) account by dividing the number of males or time spent with males by the sum of male and female scores. Means and standard deviations are presented in Table 2. There was a significant sex difference only for the number of waking contacts provided by the social contact questionnaire (retrospective) but not for the other indices. As can be seen, the difference between dream character ratios was marginally significant, with a medium effect size. The retrospective questionnaire on the number of daytime gender contact patterns revealed a large effect, whereas a small one was found for the prospective time measure.

Due to the small number of male participants in the sample, we present results regarding the relationship status for women only. Out of the 51 female participants, 47 provided information about their relationship status. In particular, 19 females were single (mean age 21.5 ± 2.6 yrs) and 28 in a heterosexual relationship (mean age 21.5 ± 3.4 yrs). Despite medium effect sizes, the retrospective gathered data from the daytime questionnaire revealed no significant differences (see Table 3). In contrast, the prospective measures (daytime diary and dream reports) show large effect sizes and significant differences in the proportion of male characters. In order to test whether daytime differences explain the differing ratios of male dream characters between singles and non-singles, we applied an analysis of covariance to control for time spent in waking-life. The ratio of male dream characters between both groups was still marginally significant (ANCOVA: F(1, 39) = 3.4; p = .0748 with male character ratio for daytime contact as covariate).

Finally, we calculated partial correlations of male character ratios for the different kinds of questionnaires we used (gender, coded as 1 = women and 0 = men, was partialled out). All correlations reached the level of significance and magnitudes ranged from low till high (see Table 4). The questionnaires concerning waking social patterns showed high intercorrelations. The relationships between the proportion of male dream characters and all of the waking-life measures of social contact patterns were significant.

Table 3. Male character ratios[1] of female participants separated by relationship status

Variable	Relationship	Single	Group difference	Effect size
Social contact questionnaire[2]				
Number	0.34 ± 0.15	0.40 ± 0.14	t(42) = 1.4; p = .1567	d = -0.411
Time spent	0.41 ± 0.20	0.31 ± 0.19	t(42) = -1.7; p = .0908	d = 0.510
Daytime diary[3]				
Time spent	0.50 ± 0.19	0.26 ± 0.19	t(45) = -4.2; p < .0001	d = 1.263
Dream reports[3]				
Number	0.54 ± 0.20	0.36 ± 0.23	t(40) = -2.7; p = .0115	d = 0.847

[1] Male character ratios were calculated by number of male characters divides by the sum of male and female characters, [2] Social contact question-naire: retrospective, [3] Daytime diary, dream reports: prospective, # One-tailed t-test

Table 4. Partial correlations* between different male/female ratios of waking contacts and dream characters

Variable	Social contact questionnaire (Number)	Social contact questionnaire Time spent	Daytime diary Time spent
Social contact questionnaire[1]			
Time spent	r = 0.708 (p < .0001)		
Daytime diary[2]			
Time spent	r = 0.431 (p = .0009)	r = 0.784 (p < .0001)	
Dream reports[2]			
Number	r = 0.289 (p = .0400)	r = 0.315 (p = .0244)	r = 0.331 (p = .0137)

[1] Social contact questionnaire: retrospective, [2] Daytime diary, dream reports: prospective, * Gender was partialled out

4. Discussion

Overall, the present study confirmed earlier findings that men dream more about male than female characters, despite the fact that both sexes actually do spend the same amount of their waking time with men (female: 41%; male 43%) and, in particular, more time with women. That is probably because our sample consisted primarily of psychology students with more than two thirds of females. Taking the relationship status into account, our findings further suggest that only female participants with a partner dream equally about both genders (54% male vs. 46% female characters) and spent an equal amount of their waking time with both, men and women (50% respectively). However, single female participants, compared to those in a relationship, spent less time with men while awake and also dreamed less about male characters. In contrast, Schredl (2001) found the balanced dream character ratio in women only for singles (48.3%) but not for those with a partner (62.3%). This might be due to waking-life differences regarding their daytime contact patterns. Since Schredl (2001) did not ask participants about waking contacts no final conclusion could be made. However, both studies demonstrate that the male dream character ratio in women increases with being in a relationship (12% in Schredl, 2001 and 18% in the current study) which might be due to the positive correlation between being in a relationship and the number of other sex peers (Connolly, Furman & Konarski, 2000) supporting the continuity hypothesis of dreaming. Our results, together with those of Schredl (2001), clearly indicate that it is not gender per se that accounts for the amount of male and female dream characters (c.f. Hall, 1984; Schredl & Jacob, 1998). This renders general explanations of the gender difference in dream characters like the Oedipus complex as not very plausible.

On the other hand, Dudley and Swank (1990) found no lowered ratios (compared to the normative findings of Hall and Van de Castle) in women's dreams gathered from an all girl's school. Domhoff (1996), however, pointed out that continuity may occur not with behavior itself, but with waking thoughts and fantasies, as he demonstrated in a dream series with more than 1000 dreams in a three years period. The dreamer, Karl, had many impassioned sex dreams within the three years, much more than the normative findings of Hall and Van de Castle (1966) would have predicted. It was concluded that Karl must have had many sexual relations in his waking-life but that was not the case. In contrast, because of his discouraging sexual experiences he had lots of sexual fantasies and ended up in frequent masturbation. Schredl, Desch, Röming and Spachmann (2009) obtained comparable results by showing that the frequency of erotic dreams is related to the time spent with sexual fantasies and not with actual intercourse or masturbation. These are only two of many examples showing that waking fantasies and concerns also account for dream content. The present study operationalized waking-life experience as measured by time spent with men and women during the day and we did not explicitly elicit emotional concerns or the amount of fantasies and thoughts of other persons. We assume that both, experiences ("overt behavior") and preoccupations and fantasies ("covert behavior") account for the content of our dreams like Hall and Nordby (1972) suggested. One can measure the total amount of time and intensity of waking contacts (waking life experiences) and/or eliciting global attitudes (preoccupations) towards a person. It is not easy to separate those areas and operationalize them independently, for example, spending a lot of time with a person is very likely correlated with the importance of this particular person within the inner world of oneself. Thus it is recommended to differentiate more clearly between waking-life overt social contacts and the time spent thinking about or being concerned with other people. We used only one measure for both areas in this study.

To further explain gender differences in dream content, sex-role identification was suggested by Cohen (1973) as a possible reason but Waterman, de Jong and Magdeliyns (1988) were not able to confirm that sex role orientation was related to the male/female percent of dream characters. Schredl, Paul, Lahl and Göritz (2010-2011) showed that the amount of male dream characters was to some extent explained by instrumentality (as an indicator for masculinity) but their findings suggest other factors are important too. The social role of a person seems to be related to his or her dream content (Lortie-Lussier, Schwab & De Koninck, 1985; Lortie-Lussier, Simond, Rinfret & De Koninck, 1992; Schredl & Jacob 1998). This could be explained by different contact patterns regarding different social roles, i.e. predominantly male or female environment. Future studies should address this by not only eliciting social roles but also social contact patterns of these roles.

Our present results support the continuity hypothesis by showing that women with a male partner dream more about men (54% male dream characters) compared to those not being in a relationship (36% male dream characters). This is only partly explained by the amount of time spent with men and women during the day, because the difference is still marginally significant if the waking-life social pattern is taken into account. This might be explained by intensity of the social contacts which was not elicited in the present study. These findings are in line with previous studies demonstrating that waking contact patterns influence the gender proportions in dreams (Schredl & Jacob, 1998; Schredl, Loßnitzer & Vetter, 1998; Schredl, 2001). We followed Schredl, Sahin and Schäfer (1998) who suggested taking all waking-life relations of a person into account (for example: kinship, friends, colleagues, etc.) by evaluating the frequency of participants waking contacts.

Although questionnaire measures and diary are highly intercorrelated, the effect sizes regarding the prospective measure (d = 0.096) showed almost no difference between male and female participants but for the retrospective measure, there was a small but substantial difference (d = 0.284). Looking at the findings comparing singles vs. non-singles, the difference between retrospective and prospective measures is even more pronounced. Future studies should address this concern by comparing retrospectively and prospectively gathered daytime information. As far as can be concluded by our findings, and the well established fact that there is a bias in retrospective measures (e.g. Bernard, Killworth, Kronenfeld & Sailer, 1984), prospective data acquisition should be preferred when comparing waking and dreaming activities. Schredl (2012) pointed out how important it is for studying the continuity hypothesis of dreaming to measure the waking-life variable in a reliable way.

All correlations between the daytime measures and the gender ratio of dream characters are small. First, we expected that correlating mean values for two weeks and retrospective measures would result in increased error variances and thus reduce the magnitude of the correlation coefficients. As the highest correlation was found for the prospective daytime measure and dream ratios, we can conclude that prospective daytime measures lead to a better match between waking and dreaming data. From a theoretical viewpoint, it is quite possible that there are other factors that affect the incorporation of daytime contacts into dreams, e.g., emotional intensity of the waking-life contact (cf. Schredl, 2006).

One problem of the study is the small amount of male participants in the sample which is why we were not able to correlate differences in waking-life social patterns with dream content for men and women separately. Future investigations should include larger samples of men since there seem to be a differential effect of relationship status on dream character's gender ratio between men and women as suggested by Schredl (2001). Future studies may also try to distinguish between waking-life overt social contact patterns on one hand and covert behavior like concerns and preoccupations on the other hand to investigate whether there are differences regarding these two domains.

To summarize, the present study demonstrate that men dream more about male characters whereas women dream equally about both genders and the ratio of male and female dream characters was correlated to the current waking-life social contact pattern. Furthermore, relationship status had an effect on the gender pattern of dream characters. This finding does not support the notion of ubiquitous gender differences regarding the sex ratio of dream characters (cf. Hall, 1984) but shows that current waking-life patterns are influential, supporting the continuity hypothesis of dreaming. In order to compare waking and dreaming contact patterns, prospective measures, like diaries, should be preferred to retrospective data collection.

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