Predicting the dreamer's gender from a single dream report: a matching study in a non-student sample

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Summary. Research has demonstrated stable gender differences in dream recall and dream content. Previous matching studies using student samples showed that the judges were able to correctly match the dreamer's gender based on a single dream report with a probability better than chance. Using dream reports from a non-student sample only slightly increased the accuracy of matching gender despite the fact that the differences relating to waking life environment should differ more for the older sample of this study. Overall, accuracy results were of small effect size. It must be concluded that making a valid prediction of a simple characteristic of the dreamer, like gender, requires more dream material. For the clinical praxis, it would be interesting to study the accuracy of dream interpretations quantitatively.

Keywords: Dream content, gender differences

1. Introduction

Gender differences in dream recall and dream content have been studied widely (overview: Schredl, 2007a). Overall, the findings regarding dream recall were quite stable: women tend to recall dreams more often than men (Schredl & Reinhard, 2008). As for dream content, men's dreams more often include physical aggression (Hall & Van de Castle, 1966) and sexuality (Schredl, Desch, Röming, & Spachmann, 2009); whereas women dream more often about indoor settings (Hall & Van de Castle, 1966) and interpersonal problems (Schredl, 2001). A distinct difference was also reported for the ratio of male and female dream characters (Hall, 1984; Hall & Domhoff, 1963): the percentage of male dream characters is about 66%, while the ratio of male dream characters is 50% in women's dreams. Given these findings, one might speculate about the accuracy of identifying the dreamer's gender based on a single dream report.

The first study was carried out by Merritt, Stickgold, Pace-Schott, Williams, & Hobson (1994). The authors presented to ten judges 10 dreams from women and 10 dreams from men in a random sequence. Overall, correct matches totaled 61% which was significant at p = .0007, and above the chance level of 50%. In two subsequent studies (Schredl, 2008; Schredl, Schwenger, & Dehe, 2004), four judges classified 100 dream reports from men and 100 dream reports from women and obtained similar success rates (57.5% to 64.5%). Interestingly, the female judges were more confident in their correct matching of the dream reports of women (compared to their incorrect matches) than they were confident in classifying the dream reports of men (Schredl, et al., 2004). The analogue difference, however, was not found for the male judges (Schredl, 2008). The effect of the sizes of these three studies was small (d = 0.29 maximum). Despite the differences between men's and women's dreams (see above) and the extensive reading of various dream content analytic papers on gender differences in dreaming by the judges in the studies of Schredl et al. (2004) and Schredl (2008) – the judges' matches were anything but perfect.

Based on the continuity hypothesis of dreaming (Schredl, 2003), one might argue that dream reports of male and female students do not differ very much because they share a very similar environment (classes, exams, friends, parties etc.). Schredl and Erlacher (2008), for example, showed that the amount of time spent on sports activities and reading during the day correlated directly and significantly with the percentage of dreams incorporating these topics. This line of thinking would mean that predicting a dreamer's gender from a single dream report should be easier if the waking life environments of the men and women contributing dreams differ markedly.

The present study investigated the accuracy of judges to predict the dreamer's gender from a single dream report using dream reports from a non-student sample. It was assumed that the waking life environments of non-students would be more different than the waking life environments of students. Three hypotheses were tested:

1. The judges would be able to predict the gender of non-students in this study with a probability higher than chance (50%).
2. The judges' accuracy of prediction of gender in this study of non-students would be higher than the judges' accuracy in previous student sample studies.
3. The judges in this study would be more confident in their correct decisions than in their incorrect ones.

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2. Materials and methods

2.1. Measurement instruments

The two judges received forms on which to record their decisions (male or female). In addition, the judges were asked to estimate their subjective confidence in this decision using

a four-point scale of 0 = very low confidence; 1 = low confidence; 2 = moderate confidence; 3 = high confidence.

2.2. Procedure

Dream reports were selected from an online study by (Schredl, Paul, Lahl, & Göritz, 2010). For this study, participants were asked to report the most recent dream as fully as possible using the (for a full instructions see: Domhoff, 1996). A dream report had to fulfill the criteria that it consisted of 50 to 300 words. Only one dream, the exception, consisted of 49 words. The selection of dreams started with the oldest male participants in the sample. This selection of dreams was matched with dreams of comparable length from female participants matched for age (plus/minus 2 years). Seventy seven (77) of the 200 total dreams were altered linguistically so that the gender of the dreamer was not apparent in the wording of the dreams, e.g., boy or girl friend was altered into boy/girl friend; he/she, his/her, etc. The dream reports were randomly ordered.

First, the judges were asked to read several studies on gender differences in dream content (Hall, 1984; Hall & Domhoff, 1963; Hall, Domhoff, Blick, & Weesner, 1982; Schredl, 2007a, 2007b; Schredl & Jacob, 1998; Schredl, Loßnitzer, & Vetter, 1998; Schredl & Pallmer, 1998; Schredl, Sahin, & Schäfer, 1998; Winget, Kramer, & Whitman, 1972). Each of the two judges rated all 200 dream reports independently on the gender of the dreamer and his/her subjective confidence in his/her decisions. Statistical analyses were carried out using the SAS 9.1 software package for Windows.

2.3. Participants

One hundred dream reports from male dreamers and the same number of dream reports from female dreamers were included in this study. Each dream report came from a different person. The mean age of the male group (51.2 ± 8.4 yrs.) did not differ from that of the female group (51.1 ± 8.4 yrs., t = 0.0, p = .9932). The age range in both groups was 36 years to 69 years. Mean dream length also did not differ between the sexes (91.5 ± 42.4 (women) vs. 91.0 ± 42.0 (men), t = -0.1, p = .9280).

The two judges were female psychology students, aged 20 yrs.

3. Results

3.1. Matching task

The exact agreement between the two judges amounted to 74.5% which is comparable to the figure of 73.5% reported by Schredl, et al, 2004. Both judges were able to predict the gender of the dreamers from the dreams by more than 50%, or well above chance level (see Table 1). However, the mean percentage of the present study of non-students (66.25%) was not significantly higher than the percentage of the (Schredl, et al., 2004) study using a student sample (64.25%, z = 0.6, p = .2762, one-tailed).

Although dream length was slightly related to the judges' confidence ratings (Judge 1: r = .133, p = .0612; Judge 2: r = .100, p = .1575), this variable did not affect the accuracy of the judgments (Judge 1: r = .017, p = .8072; Judge 2: r = .019, p = .7878; correlations between correct vs. incorrect matches and dream length). The dreamer's age also was not related to the accuracy of the judges' predictions (Judge 1: r = .064, p = .3706; Judge 2: r = -.016, p = .8226).

Table 1: Correct decisions of determining the dreamer's gender)

	Correct	Effect size	Chi² test Chi² =	p =
Judge 1	64.5%	d = 0.29	16.9	<.0001
Judge 2	68.0%	d = 0.37	25.9	<.0001

The frequency of altering the dream report linguistically to ensure gender neutrality was not different between the sexes (32 women's dreams vs. 35 men's dreams, $Chi^2 = 0.2$, df = 1, p = .6531). These alterations did not affect the decisions of the two judges (Judge 1: 35.7% (correct) vs. 29.6% (incorrect), $Chi^2 = 0.8$, df = 1, p = .3832; Judge 2: 36.0% (correct) vs. 28.1% (incorrect), $Chi^2 = 1.2$, df = 1, p = .2692; the figures are the percentage of altered dreams in the group of correct versus incorrect matched dreams).

3.2. Confidence ratings

Both Judge 1 and Judge 2 rated their confidence in their correct predictions higher than in the incorrect ones (see Table 2). When the judges' confidence ratings were analyzed for women's dreams and men's dreams separately, an interesting result emerged. The differences in the confidence ratings for Judge 1 are almost comparable. However, Judge 2 was much more confident about her accuracy of correctly predicting gender in women's dreams than in correctly predicting gender in men's dreams. Her confidence ratings were similar for correct and incorrect predictions of gender in men's dreams (see Table 2).

3.3. Dream examples

"Dream Example 1: A friend of mine who I love now has a boyfriend/girlfriend and wants to move in with him/her. I saw them looking for apartments and viewing a specific apartment and how in love they were. I saw the particular apartment very clearly; the interior design; listened to them talking about the apartment's condition and what could and should be altered; and recognized the joy that they both felt about being able to afford the rent for this apartment. They wanted to take it. I felt a huge sadness within me because my hopes that he/she might prefer me over him/her were dashed. I wanted to pine away, because for him/her to move in with someone else reflects more distance between us."

Result: Both judges rated this dream with high confidence as a woman's dream although the dreamer was a 52 year old male.

"Dream example 2: It was dark and I flew over a dark and unfamiliar landscape. I heard the storm rant in the dark tree tops. I touched down and drew a weapon because enemies approached in the dark night. I didn't feel fear, but was interested in what would happen next. I eventually drove them away. I looked around and discovered a

Table 2: Judges' confidence ratings in predicting dreamer's gender

Variable		Correct (N =)	Incorrect (N =)	Effect size	t-test[1] t = p =
All dreams	Judge 1	2.14 ± 0.85 (129)	1.59 ± 0.98 (71)	d = 0.60	4.1 <.0001
	Judge 2	1.35 ± 1.04 (136)	0.84 ± 1.01 (64)	d = 0.50	3.2 .0008
Male dreams	Judge 1	2.09 ± 0.93 (67)	1.64 ± 0.93 (33)	d = 0.48	2.3 .0122
	Judge 2	1.01 ± 0.98 (68)	1.16 ± 1.14 (32)	d = -0.14	-0.6 .7373
Female dreams	Judge 1	2.19 ± 0.74 (62)	1.55 ± 1.03 (38)	d = 0.71	3.3 .0008
	Judge 2	1.68 ± 1.00 (68)	0.53 ± 0.76 (32)	d = 1.29	5.7 <.0001

[1] one-tailed statistical tests

dark building in front of me. I approached the building with caution and opened the door. Someone, who I did not recognize, yelled at me that I had to fulfill a mission."

Result: Both judges rated this dream correctly with high confidence as a dream from a male participant.

"Dream example 3: My chain store closes. Loyalty cards for customers are very important in our company. I belong to the most proficient "loyalty card designers". I received a call and was asked to distribute loyalty cards in another store. After I finished 25 cards, I made an announcement on the loudspeaker. After a few moments, my present boss, who took over this chain store, was standing in front of me and said: "The voice on the loudspeaker sounded familiar. I just wanted to check whether I recognized it correctly."

Result: Both judges rated this dream with high confidence as a dream from a female partipant but the dream was reported by a man.

"Dream example 4: I was in the woods. At the beginning, it was pleasant until my daughter joined me. She looked very odd: different hair cut, different hair color, and black clothes. We quarreled about her apparel. We quarreled about her behavior. We argued intensely and did not agree. I was very upset."

Result: Both judges rated this dream with high confidence correctly as a dream from a female participant.

4. Discussion

The present study demonstrated again that a greater than chance prediction of the dreamer's gender based on a single dream is possible (cf. Merritt, et al., 1994; Schredl, 2008; Schredl, et al., 2004). However, if one takes into consideration that predicting the dreamer's gender by chance yielded 50 % correct judgements, it seems clear that a reliable prediction of dreamer gender is only possible for a limited number of dream reports, i.e., in a single case. In this instance, the rate of false positives and false negatives will be very high.

The content of dream example 1 revolved around interpersonal issues which were more often found in women's dreams than in men's dreams (Schredl, 2001). Dream 1 was thus incorrectly classified as to gender. Similarly, as work-related topics are more common in men's dreams (Schredl & Piel, 2005), both judges made false judgments regarding dream example 3. The other two dream examples fit in the content analytic findings that men dream more often about physical aggression and weapons (Hall & Van de Castle, 1966) and women more often about interpersonal conflicts (Schredl, 2001). It would be very interesting to replicate this kind of study by increasing the number of dreams per participant. As Schredl (1998) demonstrated, up to 20 dreams per participant might be necessary to obtain highly reliable measures of the dreamer's content analytic traits.

The hypothesis that gender differences in non-student dream samples could be more easily predicted was not confirmed by the present study, even though the mean of correct predictions was slightly higher than in the study of students' dreams (Schredl, et al., 2004). In this study and the study of Schredl et al. (2004) female psychology students served as judges, i.e., compatible in this respect (the percentage of correct matches were lower for male medical students as judges; Schredl, 2008).

In this study no information about the occupation of the participants was available. The study by Lortie-Lussier, Schwab, & De Koninck (1985), for example, showed marked differences in dream content between homemakers and working mothers (see incorrectly predicted dream example 3). One might expect more pronounced findings if the waking life of men and women differs as much as possible. On the other hand, it would be interesting to study whether or not differences between the sexes in dream content could be predicted if both sexes were living in similar waking life environments. Schredl et al. (2010) showed that dream content was related to sex role orientation in addition to the effect of biological sex. Sex role orientation is a trait concept that is not independent of current waking life activities (more masculine persons might choose different recreational activities or films, for example), but might help to explain that the findings regarding gender differences in dreams in student and non-student samples are comparable even if some dream aspects, e.g., male/female ratio of dream characters, are diametrically different (Schredl & Keller, 2008-2009).

With regard to potential mediating variables such as dream length, the dreamer's age and linguistic alteration of the dream report, it may be safely concluded that their influences on the present findings are negligible; i.e., longer dreams could not be classified more easily. As stated above, for improving the accuracy of prediction by the judg-

es, more dream reports per participant would be needed.

As expected, the confidence ratings were significantly higher for the correct decisions than for incorrect decisions; i.e., some dreams were classified easily (see dream examples 2 and 4), whereas others were difficult to judge with respect to the dreamer's gender.

The finding about the differences in the judges' confidence ratings for men's and women's dreams is very interesting. Both judges showed higher confidence in their correct ratings of women's dreams (compared to the incorrect ratings) than their ratings for men's dreams. For Judge 2, there were no differences in the confidence ratings between correct and incorrect decisions about men's dreams. As the judges of the present study were female, it seems plausible that women are more confident about predicting women's dreams (cf. Schredl, et al., 2004). The follow-up study (Schredl, 2008) of the 2004 study, however, could not demonstrate the corresponding effect for male judges. One conclusion might be that dreams are more typically for women then for men.

Generally, this study and its predecessors (Merritt, et al., 1994; Schredl, 2008; Schredl, et al., 2004) demonstrated that a single dream report has some predictive value regarding the dreamer, but the accuracy of the predictions – even for such a simple variable like gender – is far from perfect. Thus, dream interpretations without consulting the dreamer should be made with caution.

To summarize, the judges were able to predict the dreamer's gender based on a single dream report with a probability better than chance. However, the difference between student samples and non-student samples was not significant. The rate of correct decisions by the judges was not high, so a reliable prediction based on a single dream report is not possible. It must be concluded that even for predicting simple characteristics of the dreamer more dream material is necessary to make a valid prediction. For the clinical praxis, a fruitful avenue might be to study the accuracy of dream interpretations quantitatively, similar to the qualitative studies done by Zane (1971) and Fosshage and Loew (1978).

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