The present study investigated the effects of socio-demographic variables on dream content in a representative sample. The analyses of 380 most recent dreams showed that almost none of the socio-demographic variables like age, gender, marital status, education, income, nor town (or city) of residence size was significantly related to general dream characteristics like dream length, bizarreness, and intensity of dream emotions, thus indicating that dreaming is a universal phenomenon shared by all humans and is experienced in similar ways. On the other hand, dream content—in contrast to the general dream characteristics—is determined by waking-life experiences. This is clearly shown by the gender differences found in the present study: more work-related themes and physical aggression in men’s dreams. In order to generalize these findings, it will be necessary to apply other dream collection methods like dream diary or laboratory awakenings in large, representative samples in order to obtain and analyze the dream reports of persons who do not often recall their dreams and who are not able to report their most recent dream to an interviewer.
INTRODUCTION

The first content analysis of a large sample of dream reports was published by Hall and Van de Castle (1966). They included 1,000 diary dream reports (length: 50 to 300 words) from 200 students aged 18 to 25 years, elicited in the time period from 1947 to 1950. In chapter 14 of their book entitled Norms, Hall and Van de Castle (1966) presented the coding results for women and men separately. Many of the findings, for example, regarding the gender differences (more physical aggression, more sexual activity, more outdoor settings, higher percentage of male dream characters in men’s dreams) have been replicated by subsequent studies (e.g., Hall, Domhoff, Blick, & Weesner, 1982; Schredl, Sahin, & Schäfer, 1998) which were also most often carried out in student samples. A preponderance of male dream characters in men’s dreams and an equal proportion of male and female characters in women’s dreams were reported in many different samples (Hall, 1984). Findings based on non-student samples sometimes yielded different results; for example, Rubenstein and Krippner (1991) found no gender difference in the percentage of male dream characters in dreams of persons who answered a television announcement for free dream interpretation. Similar, the male/female percent of dream characters was comparable for men (58%) and women (57%) in the study of Krippner et al. (1998) who recruited participants of dream seminars, mostly working adults. However, the dream samples of the non-student samples might also be biased, for example, the dream selected for dream analysis might not be representative for the dream life of this person. For investigating the effects of socio-demographic variables like age, gender, marital status, and educational level, representative dream samples should be studied.

Up to now, only one representative study of dream content has been reported in the scientific literature (Kramer, Winget, & Whitman, 1971; Winget, Kramer, & Whitman, 1972). In this study, 300 citizens of Cincinnati (a stratified random sample) were interviewed about general environmental health issues at home; 60.7% reported a most recent dream in the course of the interview. Women reported dreams more often than men (65% vs. 53%). Mean dream length was 21 words. Most of the dream reports were described as mundane with a realistic focus (Kramer et al., 1971). Using the Hall and Van de Castle rating scales, 12% of the dream reports included unpleasant emotions whereas only 4% included positive emotions. Applying another content analytic rating system (Gottschalk-Gleser), the dream reports were divided into unpleasant (54%), pleasant (26%), and neutral (20%) dreams. The higher percentage of dreams with emotions is explained by the differing coding rules since Hall and Van de Castle (1966) coded only emotions that were explicitly mentioned whereas the Gottschalk-Gleser systems allows inferences regarding emotions from the dream action. Work and business-related topics were present in 11.3% of the dream reports (Kramer et al., 1971). Gender was an important factor in explaining interindividual differences,
e.g., men reported more dreams with aggression and women more dream emotions (Winget et al., 1972).

The study, however, had several methodological problems. First, the authors did not report the percentage of participants who did not consent to being interviewed. Second, the time intervals between interview and the occurrence of the most recent dreams were not given in the published papers. Third, the statistical analysis did not investigate the effects of all socio-demographic variables simultaneously and, thus, the findings might be biased, for example, the heightened occurrence of death anxiety in widower’s dreams might be explained by age (cf. Winget et al., 1972).

In the present study, the most recent dreams of a representative German sample were analyzed. Regression analyses were computed in order to test the effect of all socio-demographic variables simultaneously.

**METHOD**

**Interview**

The participants were interviewed at home. In order to elicit dream recall, a 7-point dream recall frequency scale (coded from 0: never, 1: less than once a month, 2: about once a month, 3: two or three times a month, 4: about once a week, 5: several times a week, and 6: almost every morning) was presented on the monitor of a portable computer. The dream recall frequency scale has a high retest reliability (r = .85; Schredl, 2004a). Next, the participants were asked to report their most recent dream as completely as possible (including characters, actions, and emotions). The interviewer asked once whether there was anything else they could remember. The dream was typed in by the interviewer while the participant was telling the dream using the words of the dreamer. Lastly, the time interval between the date of the dream and the date of the interview was recorded.

The following socio-demographic variables were included in the study: age, gender, education (five levels), income (15 levels ranging from “below 249 Euro per month” to “over 5,000 Euro per month”), marital status (married/living with partner, single/living without partner), and town (or city) of residence size (7 levels ranging from “below 2000 inhabitants” to “over 500,000 inhabitants”).

**Dream Content Analysis**

The dream content analytic scales used in this study were adopted from Schredl, Sahin, and Schäfer (1998): realism/bizarreness (1 = realistic to 4 = two or more bizarre elements within the dream), positive and negative emotions (two 4-point scales: 0 = none, 1 = mild, 2 = moderate, 3 = strong), number of male and female dream characters, occurrence of work-related dreams and occurrence of verbal and/or physical aggression. The interrater reliability of these scales are satisfactory, r = .765 (realism/bizarreness), r = .642 (positive emotions), r = .825
(negative emotions), occurrence of aggression (88% exact agreement; all data from Schredl, Burchert, & Grabatin, 2004). The exact agreement for work-related themes was 94.2% (Schredl, 1998).

**Participants**

Overall, a representative sample of 1,380 persons was drawn from German households that include persons over 14 years old. The sample size was reduced to 1,033 (550 women, 483 men) because of dropouts due to the following reasons: “not available for the interview” ($N = 180$), refusing to participate ($N = 145$), and other reasons ($N = 22$). The response rate was 74.9%. The mean age of the sample was 47.9 years ($SD = 18.3$).

**Procedure**

The study was carried out by Ipsos GmbH, Mölln, Germany. The participants were contacted at home and interviewed concerning a variety of topics (attitudes toward chocolate, familiarity of specific products, amount of media consumption, etc.). The typed dream reports were edited in order to remove all information not related to the dream experience (cf. Schredl, 1999). Then the dream reports were rated along the scales described in the dream content analysis section. Statistical procedures were carried out with the SAS 9.1 software package for Windows.

**RESULTS**

Overall, 36.8% of the participants reported a most recent dream to the interviewer. The percentage of persons reporting a dream declined with age whereas the other socio-demographic variables had no effect (see Table 1). Participants with high dream recall reported a dream more often than persons with low dream recall, the correlation between dream recall frequency and reporting a dream (Yes/No) was significant ($r = .487, p < .0001; N = 933$). The mean age of the 380 participants (214 women, 166 men) reporting a dream was 46.4 years ($SD = 17.8$).

For 322 dream reports, the participants stated when the dream occurred. The answers were classified into three categories: 57.8% of the dreams were not older than 14 days. 33.9% of the dreams were dreamt between 14 days and one year before the interview, and only 8.4% of the dreams occurred more than one year prior to the interview. None of the socio-demographic variables (age, gender, marital status, educational level, income, residence location size) had an effect on the time interval between telling the dream and the actual occurrence of the dream.

The mean length of the 380 dream reports amounted to 23.1 words ($SD = 14$). There was no gender difference (cf. Table 2; women: 23.5 [$SD = 15.3$] vs. men: 22.5 [$SD = 14.2$]). The other socio-demographic variables were also not associated with dream report length (see Table 2).
The distribution of the realism/bizarreness scale is depicted in Table 3. About one-third of the dreams included at least one bizarre element whereas the other two-thirds of the dream reports were realistic but to some extent implausible regarding the everyday world of the dreamer. Out of the socio-demographic variables, only gender was associated with dream bizarreness, that is, women reported more bizarre dreams than men did (see Table 2).

The intensities of positive and negative dream emotions are presented in Table 4. In 105 dream reports (27.6%), the rater did not code any emotions. The dream reports were classified into three categories: predominantly positive dreams (29.7%), neutral/balanced (28.2%), and predominantly negative dreams (42.1%). The difference in percentage between positive and negative dreams was significant (Sign Rank test: $S = -5056, p < .0001$). None of the socio-demographic variables correlated with positive or negative emotions except for the negative association between educational level and negative dream emotions. Participants with higher educational levels reported negatively toned dreams less often (see Table 2).

Men reported work-related dreams more often than women (19.3% vs. 10.3%). This difference was statistically significant (see Table 2) whereas the other socio-demographic variables did not affect the amount of work-related dreams.

In men’s dreams 29 of the dream characters were male and 24 were female. On the other hand, 56 male dream characters and 30 female dream characters were found in women’s dreams. The ratio of male characters to the sum of male and female characters differed significantly between the sexes (men: 51.8% vs. women: 65.1 %, effect size: $d = 0.271, z = -2.6, p = .0088$). In a second step, the analyses was repeated for single persons ($N = 160$; 60 men and 100 women) and for persons with stable partnerships ($N = 220$; 106 men, 114 women). For men in
Table 2. Logistic Regressions for Dream Content Variables \((N = 380)\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Word count(^a) Standardized estimate</th>
<th>Bizarreness Standardized estimate</th>
<th>Positive emotions Standardized estimate</th>
<th>Negative emotions Standardized estimate</th>
<th>Work-related dreams Standardized estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.1029</td>
<td>.0957</td>
<td>-.1094</td>
<td>.0209</td>
<td>.0055</td>
</tr>
<tr>
<td>Gender</td>
<td>.0433</td>
<td>.1058*</td>
<td>-.0169</td>
<td>.0760</td>
<td>-.2053**</td>
</tr>
<tr>
<td>Marital status</td>
<td>.1066</td>
<td>-.0201</td>
<td>.0167</td>
<td>.0203</td>
<td>-.0059</td>
</tr>
<tr>
<td>Education</td>
<td>.0241</td>
<td>.0230</td>
<td>.0033</td>
<td>-.1166*</td>
<td>.0970</td>
</tr>
<tr>
<td>Monthly income</td>
<td>-.0183</td>
<td>-.0313</td>
<td>-.0590</td>
<td>.1017</td>
<td>-.0558</td>
</tr>
<tr>
<td>Residence location size</td>
<td>.0122</td>
<td>-.0072</td>
<td>.0373</td>
<td>-.0382</td>
<td>.0709</td>
</tr>
</tbody>
</table>

\(^a\)Parametric regression analysis

\(^*p < .05\), \(^**p < .01\) (one-tailed).
Table 3. Dream Bizarreness *(N = 380 Dream Reports)*

<table>
<thead>
<tr>
<th>Category</th>
<th>Women (N = 214)</th>
<th>Men (N = 166)</th>
<th>Total (N = 380)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resemble ordinary everyday experiences</td>
<td>37.4%</td>
<td>50.0%</td>
<td>42.9%</td>
</tr>
<tr>
<td>Dream action is possible in waking life but extraordinary for the dreamer</td>
<td>36.9%</td>
<td>27.7%</td>
<td>32.9%</td>
</tr>
<tr>
<td>One bizarre (impossible) element within the dream</td>
<td>25.2%</td>
<td>22.3%</td>
<td>23.9%</td>
</tr>
<tr>
<td>Two or more bizarre elements within the dream</td>
<td>0.5%</td>
<td>0.0%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

Table 4. Positive and Negative Dream Emotions *(N = 380 Dream Reports)*

<table>
<thead>
<tr>
<th>Category</th>
<th>Positive emotions</th>
<th>Negative emotions</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>69.7%</td>
<td>57.1%</td>
</tr>
<tr>
<td>Mild</td>
<td>14.5%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Moderate</td>
<td>12.6%</td>
<td>21.6%</td>
</tr>
<tr>
<td>Strong</td>
<td>3.2%</td>
<td>7.9%</td>
</tr>
</tbody>
</table>

a partnership the male/female percent amounted to 47.2%; for women living in a partnership it amounted to 63.4%. This difference was significant (effect size: $-0.327, z = -2.4, p = .0153$). For single persons, no significant difference for men (60.0%) and women (66.7%) was found for the male/female percent of dream characters. Interestingly, a significant difference in the ratio of male and female dream characters was present when women that were older than 40 (*N = 49*) were compared with women younger than 40 (*N = 51*). The ratio was balanced for the younger women (47.1%) but not for the older women (78.6%). The difference was significant ($d = -0.667, z = -3.3, p = .0009$).

Forty percent of all aggressive interactions were physical in men’s dreams whereas only 27.8% of the aggressive interactions in women’s dreams were
physical. This difference is statistically significant (effect size: $d = 0.274$, $z = 2.5$, $p = .0124$).

**DISCUSSION**

The findings of the present study indicate that the effect of socio-demographic variables on general dream characteristics like dream length, dream bizarreness, and dream emotions is very small. On the other hand, gender differences were found for specific dream topics (e.g., more physical aggression in men’s dreams).

In comparison to the Kramer et al. (1971) study, the reporting rate was much lower (36.8% vs. 60.7%). This might be explained by the topics of the interviews which were related to health in the Kramer et al. study whereas in the present study a wide range of topics not remotely related to sleep or dreams was elicited. Thus, by talking about dream-related issues in the Kramer et al. study, the participants might have been primed, and the recall of most recent dreams might have been facilitated. On the other hand, Kramer et al. (1971) did not report the percentage of persons who refused to participate. In the present sample, 25.1% of the persons in the original random sample were not interviewed due to different reasons (not available for the interview, refusing to participate). Similar figures were not reported by Kramer et al. (1971).

As expected, reporting a dream was strongly correlated with dream recall frequency. Similar to the Kramer et al. study, dream reporting decreased with age. In order to include more dreams of low dream recallers, other dream collection methods with higher reporting rates would be necessary. Schredl (2002), for example, reported that low dream recallers increased their ability to recall dreams drastically by keeping a dream diary. Similarly, Goodenough et al. (1959) found that 46% of the REM awakenings in the sleep laboratory yielded a dream report in persons with low dream recall at home. This figure is much lower than in high dream recallers (93%) but it was a considerable increase compared to home dream recall which was about once a month. Using laboratory dreams for studying representative samples is difficult because dream content is affected by this measurement method. The overview of Schredl (2008) showed that 19.4% of the laboratory dreams included laboratory elements (staff, electrodes, etc.). This figure increased to 38.4% if indirect references (e.g., participating in an experiment) were also analyzed. Thus, laboratory dreams do not mirror the ordinary dreams of people in their everyday setting.

Whether the interview setting had an effect on the report rate or on the reported dream content (cf. Cartwright & Kasznia, 1991) could not be determined by the present data. It would be interesting to carry out a representative study with questionnaires posted to the participants to investigate whether the anonymity of this setting has an effect on report rate and dream content.

Over 90% of the dream reports occurred during the last year, older dreams, for example, childhood dreams were extremely rare. Kramer et al. (1971) did not
report the time intervals between telling the dream and its occurrence. The higher ratio of negative to positive dreams in the Kramer et al. study might be explained by including more childhood dreams. The investigated socio-demographic variables were not associated with the time interval between dream reporting and the occurrence of dreams; thus, the findings regarding the effect of socio-demographic variables on dream content were not affected by this variable.

The mean length of the dream reports was comparable to the findings of Kramer et al. (1971). The interview dreams are much shorter than diary dreams in young adults (136 ± 111.2 words; Schredl, 2004b) or elderly persons (41.2 ± 43.4; Schredl, Schroder, & Löw, 1996). Thus, the diary method might be useful to obtain more elaborate dream material. On the other hand, dream bizarreness is comparable to diary dreams: about 25% of the present dreams included at least one bizarre element (versus 31%; N = 365 diary dreams; Schredl, 1999; 19%; N = 500 laboratory dreams; Strauch & Meier, 1996). The gender difference was small and not in accordance with Schredl, Sahin, and Schäfer (1998) who did not find a difference between the sexes. Thus, the present finding needs further replication.

Regarding dream emotions, the representative sample of the most recent dreams indicate that there is a preponderance of negative dreams. This might be explained by recall bias because emotional quality is balanced in diary dreams (Schredl & Doll, 1998) and laboratory dreams (Strauch & Meier, 1996). It might be that more negatively toned dreams are more easily recalled—even after long periods of time (cf. Schredl, 1999).

Marked gender differences were found for work-related dreams, ratio of male and female dream characters, and physical aggression. The percentage of work-related dreams in the present study (14.2%) were comparable to the figure (11.3%) reported by Kramer et al. (1971). Confirming the results of Schredl and Piel (2005), men reported work-related dreams more often than women. This is in line with the continuity hypothesis of dreaming (cf. Schredl, 2003) because the employment rate is higher in men compared to women (64.9% [men] vs. 45.6% [women]; persons older than 20 years; Mikrozensus, Statistisches Bundesamt, Bonn, Germany; cf. Schredl & Piel, 2005).

In the total sample, women’s dream showed a higher percentage of male dream characters than men’s dreams; a finding never reported before (cf. Domhoff, 1996; Hall, 1984; Hall & Domhoff, 1963). However, if the percentages of male and female dream characters for the dreams of young singles and the dreams of persons with relationships were computed separately, the figures resemble the findings of Schredl (2001). This author reported the “ubiquitous” gender differences for singles (preponderance of male dream characters in men’s dreams and a balanced ratio of the dream characters’ gender in women’s dreams) but a different situation for persons with stable partnerships: 62.3% male dream characters were found in women’s dreams and in 48.7% in men’s dreams.
The major difference between the present study and the results of the student sample (Schredl, Sahin, and Schäfer, 1998) is the high percentage of male dream characters in dreams of women older than 40 years of age. Based on the findings that the amount of time spent with the different sexes in waking life is correlated with the male/female percent of dream characters (Schredl & Jacob, 1998; Schredl, Loßnitzer, & Vetter, 1998), one might speculate that single women over 40 spend a lot of time with males (friends, colleagues). Another line of thinking might draw on the findings of Strauch and Meier (1996) that waking thoughts affect dream content as well and some older women who were widowed might have strong memories of their former husbands and, thus, dream more often about men.

The present study confirmed findings in student samples reported earlier (Domhoff, 1996; Hall & Van de Castle, 1966; Schredl, Sahin, & Schäfer, 1998) that men dream more often about physical aggression than women. This might reflect a higher proneness to violence in men (cf. Schredl, Sahin, & Schäfer, 1998).

Overall, the findings that almost none of the socio-demographic variables like age, gender, marital status, education, income, and residence location size was significantly related to general dream characteristics like dream length, bizarreness, and intensity of dream emotions indicate that dreaming, as a universal phenomenon shared by all humans, is experienced in similar ways. On the other hand, dream content—in contrast to the general dream characteristics—is determined by waking-life experiences, this being clearly shown by the gender differences found in the present study. In order to generalize these findings, it will be necessary to apply other dream collection methods like dream diary or laboratory awakenings in large, representative samples in order to obtain and analyze dream reports of persons who do not often recall their dreams and who are not able to report a most recent dream to an interviewer.

REFERENCES


Direct reprint requests to:

M. Schredl, Ph.D.
Schlaflabor, Zentralinstitut für Seelische Gesundheit
Postfach 12 21 20
68072 Mannheim, Germany
e-mail: Michael.Schredl@zi-mannheim.de