Does global warming affect dream content? Analyzing a 30-yr. dream series

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Summary. The continuity hypothesis of dreaming postulates that dreams reflect waking life, e.g. preoccupations, experiences, thoughts; however, other topics like seasonal changes have been studied very rarely. A long dream series recorded between 1984 and 2015 (over 30 years) including 11,808 dreams showed that "cold" elements like snow, ice, and hail occurred less often over time and, thus, indicates that dreams might provide clues regarding global changes. Using modern tools for digital dream content analysis might enable researchers to validate this preliminary finding using other large data sets.

Keywords: Dream series, global warming, continuity hypothesis

1. Introduction

The continuity hypothesis of dreaming postulates that dreams reflect waking life, e.g. preoccupations, experiences, thoughts (Domhoff, 2018; Hall & Nordby, 1972; Schredl, 2012). Interestingly, most of the research investigating the continuity between waking and dreaming have focused on topics like social relationships (Schredl, Cadiñanos Echevarria, et al., 2020), work-related themes (Schredl, Anderson, et al., 2020), video gaming (Gackenbach, 2012), or media consumption (Moverley et al., 2018). Other topics, like seasonal effects, have been studied very rarely; Schredl (2004) found that winter themes are more prominent in dreams collected during the winter months than in dreams collected during the summer, supporting the idea that more general aspects of waking life also show a degree of continuity between waking and dreaming.

One environmental topic of crucial current concern is global warming (rising mean temperature levels worldwide); in different polls between 1999 and 2017 about 20% to 40% of participants stated that they are worried about the effects of global warming (Bergquist & Warshaw, 2019). In Germany, for example, the number of "ice days" (days with temperatures below zero degrees Celsius [32 degrees Fahrenheit]) decreased from 28 days in 1991 to 19 days in 2019 (Deutsches Klima-Konsortium, 2020). The question addressed in the current study is whether these global changes might be reflected in dreams.

A long dream series recorded between 1984 and 2015 (over 30 years) was analyzed to determine whether "cold" elements like snow, ice, and hail occurred with decreasing frequency over time.

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Submitted for publication: January 2021
Accepted for publication: January 2021
DOI: 10.11588/ijodr.2021.1.78020

2. Method

2.1. Participant and dream diary

The male participant started to keep an unstructured dream diary from the age of 22, with the first dream recording on 5 September, 1984. The dreamer lives in the southern part of Germany. For the present analysis, all 11,808 dreams recorded between the first dream and the 7 July, 2015 (current status of digitalized and coded dreams) were included. The mean dream length of the dreams was 135.95 ± 85.36 words.

2.2. Procedure

Dream reports were originally hand-written but were then typed and entered into a database (Alchera 3.72, created by Harry Bosma, www.mythwell.com) by the dreamer himself. This database allows the assigning of keywords to the dreams, a task that was also carried out by the dreamer. Each dream was coded by the dreamer while typing the dreams for the occurrence of snow, ice, and hail in outdoor settings.

The Alchera software provides a word count for each dream report. Reports included only dream experience-related words and all redundancies, e.g. repetitions that occurred in writing down the dream in the morning, were excluded. The analysis unit was an individual dream report. The data were exported into an Excel spreadsheet (Microsoft) and the data analysis was carried out using the SPSS 25.0 software package for Windows.

3. Results

Almost 2% of the dreams included at least one reference to snow, ice, or hail (see Table 1). Snow was most common (175 dreams), whereas ice occurred less often (36 dreams). Hail was only present in one dream. A Spearman

Rank correlation testing the continuity hypothesis prediction revealed the expected negative relationship between year and percentage of snow/ice/hail dreams per year (r = -.237, p = .100, one-tailed) (see Figure 1). Analyzed for control purposes, rain dreams from a previous analysis of the same dream series (Schredl, 2020) were included, and percentage of rain dreams per year are also depicted in Table 1. Interestingly, this Spearman Rank correlation was positive (r = .435, p = .014, two-tailed) indicating that rain dream percentage increased over the years.

4. Discussion

The present findings indicate that the percentage of dreams depicting snow, ice, or hail decreased over a 30-year period and, thus, suggest that global warming might be reflected in dreams. This decrease does not seem to be an artifact in that, for example, references to weather might decrease as the dreamer grows older (due to being outdoors less often), because the rain dream percentage increased over the years – even though no tendency for annual rainfall amounts to increase over the years 1882 to 2019 have been observed in Germany (Deutsches Klima-Konsortium, 2020). The statistics used (Spearman Rank correlations) does control for outliers but is only a crude descriptive indication for the change over time. As this analysis is based on only a single dreamer, it would be very interesting to study larger dream samples. Since a significant percentage (up to 40%) of individuals are concerned with the climate change (cf. Bergquist & Warshaw, 2019), it would also be interesting to study whether worries regarding global warming are also reflected in dreams.

To summarize, the present findings indicate that the dreams of a long-term recorder of dreams reflect a decreasing frequency of cold weather references over time. Thus, it may be that these dreams reflect not only personally important concerns of this dreamer's waking life but – if carefully analyzed –global changes in climate as well. Using modern tools for digital dream content analysis (Bulkeley & Graves, 2018; Fogli et al., 2020) researchers may be able to validate this preliminary finding using big data sets.

Table 1. Percentage of dreams with snow/ice/hail and rain per year

Year	Dreams	Snow/Ice/Hail	*Rain*
1985[1]	197	5.08%	2.03%
1986	220	2.27%	0.91%
1987	308	1.30%	1.21%
1988	501	1.00%	1.21%
1989	533	1.50%	0.56%
1990	531	1.88%	1.13%
1991	582	1.55%	0.34%
1992	879	2.16%	2.16%
1993	836	0.96%	1.32%
1994	544	1.84%	0.74%
1995	457	0.88%	1.09%
1996	484	2.69%	1.86%
1997	201	1.99%	0.50%
1998	119	0.84%	1.68%
1999	230	3.04%	1.30%
2000	79	1.27%	1.27%
2001	158	1.27%	1.27%
2002	222	3.60%	2.70%
2003	301	1.33%	1.66%
2004	298	1.34%	0.34%
2005	271	1.85%	1.48%
2006	189	0.53%	0.00%
2007	280	0.71%	1.43%
2008	507	2.37%	2.17%
2009	381	2.10%	1.57%
2010	405	1.98%	1.48%
2011	435	1.38%	2.30%
2012	387	1.03%	1.29%
2013	417	1.68%	2.88%
2014	511	1.17%	2.35%
2015	345	0.87%	1.59%[2]
1985 to 2015	11,808	1.68%	1.40%[3]

Note: *[1]20 dreams from September to December 1984 are included, [2]sample size of 314 dreams, [3]sample size of 11,777 dreams*.

Acknowledgement

The author would like to thank Harry Bosma for programming the tool used to convert the Alchera database into the Excel spreadsheet format.

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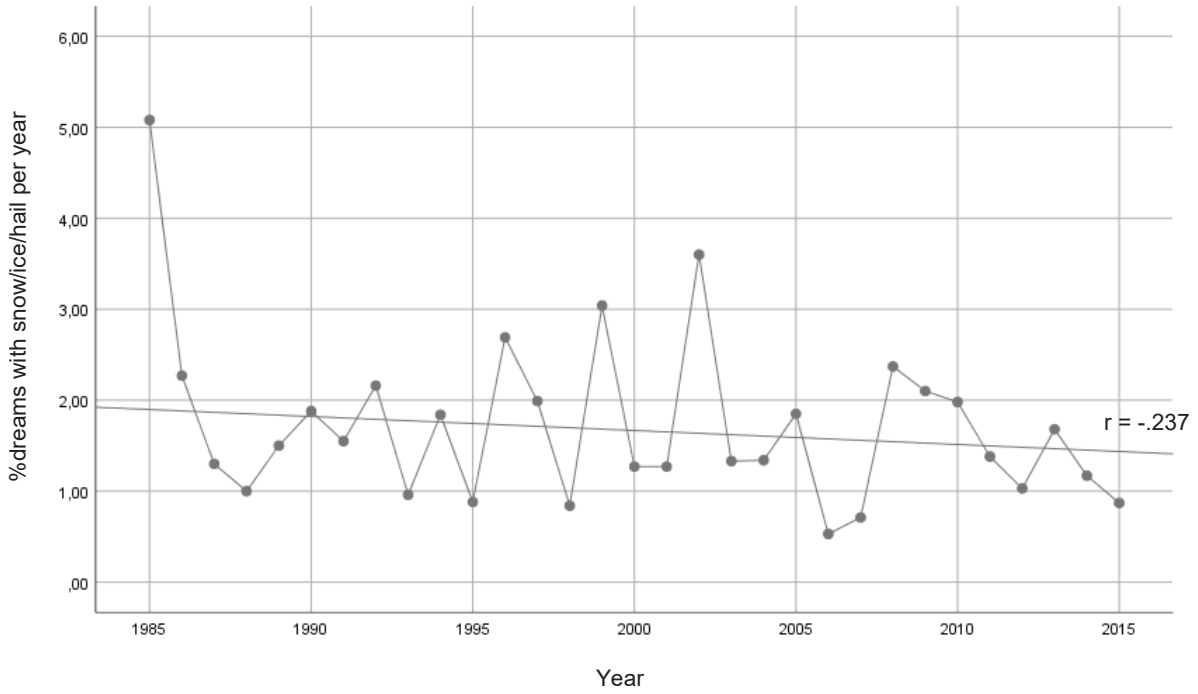

Figure 1. Percentage of dreams with snow/ice/hail per year (plus linear trend)

Schredl, M., Anderson, L. M., Kahlert, L. K., & Kumpf, C. S. (2020). Work-Related Dreams: An Online Survey. Clocks & Sleep, 2(3), 273-281. https://doi.org/10.3390/clockssleep2030021

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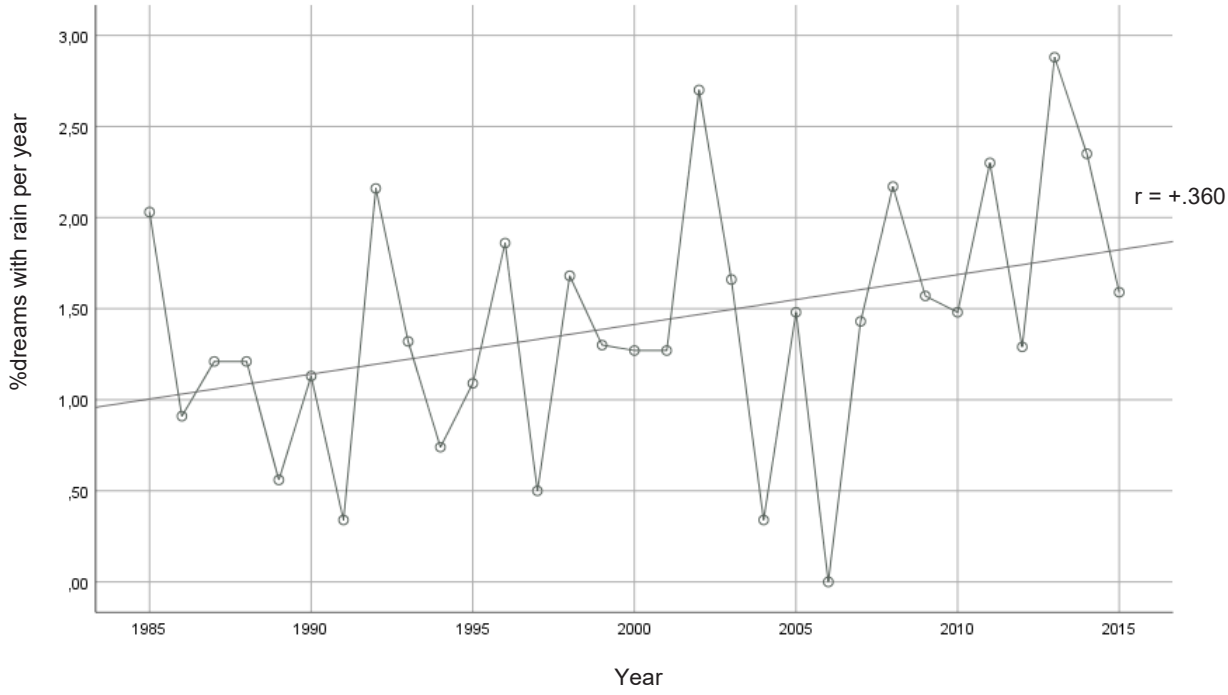

Figure 2. Percentage of dreams with rain per year (plus linear trend)