Dreams About COVID-19 Versus Normative Dreams: Trends by Gender

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Dreams about the COVID-19 pandemic were collected from 2,888 dreamers via an online survey and compared to normative dreams from an earlier period. A total of 9 categories of emotions and body concerns from the Linguistic Inquiry and Word Count (LIWC) were utilized. As predicted by the continuity hypothesis of dreaming, women showed significantly lower positive emotions in their dreams and higher rates of negative emotions, anxiety, sadness, anger, body content, references to biological processes, health, and death. For male respondents, the predicted higher score for the LIWC variable health was the only one significant at as high a level as for women. LIWC positive emotions, negative emotions, anxiety, and death were elevated in the predicted direction at lower significance levels than the effects for women. The variables anger, sadness, and body did not differ for men between the pandemic dreams and the normative sample. Results are discussed in terms of the continuity hypothesis both for distress and specific concerns of both groups and in light of the higher rate of many stressors for women versus men during the pandemic.

Keywords: COVID-19, pandemic, dreams, gender, sleep

The outbreak of COVID-19 was first identified in December 2019 in Wuhan, China. The World Health Organization (WHO) declared it a Public Health Emergency of International Concern on January 30, 2020, and a pandemic on March 11, 2020 (WHO, March 11, 2020). As of July 15, 2020, COVID-19 was documented to have killed 725,000 people around the world with 20 million confirmed cases; epidemiologists believe these figures to be major underestimates of real occurrences (Johns Hopkins, 2020).

The pandemic has caused massive social disruption and the largest global recession in history. It led to cancelation of political, religious, and cultural events and of in-person work for much of the earth's population. The International Labor Organization predicts a 6.7% loss of job hours globally in the second quarter of 2020, equivalent to 195 million full-time jobs (Mahler, Lakner, Aguilar, & Wu, 2020). Schools and universities closed for at least some of the duration in 172 countries, affecting 98.5% of the world's students (UNESCO, 2020). Effective

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ISSN: 1053-0797
2020, Vol. 30, No. 3, 216–221
http://dx.doi.org/10.1037/drm0000149

vaccines against COVID-19 are not predicted to be available before 2021 (WHO, 2020).

Other crises have influenced dream content toward more anxious dreams, many of which are about the crises. This has been documented for the September 11, 2001, terrorist attacks (Barrett, 2002; Bulkeley & Kahan, 2008; Hartmann & Basile, 2003), the Iraqi invasion of Kuwait (Barrett & Behbehani, 2003), the Oakland/Berkeley Firestorm (Siegel, 1996), and detention of Allied troops in Nazi prisoner-of-war camps during World War II (Barrett et al., 2013). More generally, the consistency hypothesis, which posits consistency between waking and dreaming, is well established (Domhoff, 2003). There are different versions of the hypothesis— one which emphasizes solely waking cognitions and personal concerns (Domhoff, 2017) and another that includes continuity with waking events as a major aspect (Schredl, 2017); however, both would suggest similar changes to dreaming during the pandemic.

The measure selected for quantifying the content of the survey dreams was the Linguistic Inquiry and Word Count (LIWC; Pennebaker, Boyd, Jordan, & Blackburn, 2015). This computer text analysis program has been shown to be easily utilized on large samples of dream accounts and to assess emotion and other content categories that correspond closely to equivalent ones of the Hall and van de Castle rating scales (Barrett, 2015; Bulkeley & Graves, 2018), which are the most standard human-scored scales for dream content (Domhoff, 2003). Nine scales of the LIWC were selected as relevant to the general emotional responses to crises and to the illness-related concerns of the current pandemic. It was hypothesized that dreams since the outset of the COVID-19 pandemic, when compared to ones from a normative, noncrisis time, would demonstrate lower scores on the LIWC scale of positive emotions, and higher scores on LIWC scales of negative emotions, anxiety, anger, sadness, biological processes, body, health, and death.

Method

Participants

Respondent's ages ranged from 18 to 91 years, with a mean of 40.08 and an *SD* of 16.89. There were 1,998 women and 890 men. Sixty-eight subjects identified as either gender neutral or transgender; this subset was deemed not large enough or consistent enough to analyze in present study, but may be included in future analyses as the survey *N* grows. Nationalities, in decreasing frequency, were 2,011 U.S., 249 British, 212 Italian, 173 Canadian, 91 Spanish, 54 Indian, 54 Peruvian, 46 German, 42 Mexican, 34 Australian, 33 Brazilian, 22 French, 22 Polish, and 73 other nationalities with less than 20 respondents each.

Materials

A survey was posted on March 23, and responses were downloaded for analysis on July 15. The survey asked respondents to submit "any dreams you have had related to the COVID-19 coronavirus." The survey also inquired about age, gender,

and nationality. The survey was announced on 11 Facebook groups—three smaller ones (611–7,461 members) focused on dreaming, and eight larger ones (27,961–41,351 members) focused on the pandemic. The survey has also been linked from articles in major media in the United States, Europe, South America, Australia, New Zealand, and India. The survey is ongoing, but the responses as of July 15 were utilized for the present analysis. Participants were invited to submit multiple relevant dreams, but only the first dream from each was used.

Procedure

The survey dreams were analyzed using the LIWC, and means and standard deviations were calculated for the nine target categories: positive emotions, negative emotions, anxiety, anger, sadness, biological processes, body, health, and death. The results were compared to LIWC results for the 981 dreams utilized for norming the Hall and van de Castle rating scales, which have been used as a comparison sample in more dream research than any others. (Domhoff, 2003). Unequal variance *t* tests were conducted with Benjamini-Hochberg corrections applied.

Results

For female respondents, the mean length in words of the dreams was 129.2, with a standard deviation of 169.9. All hypotheses were confirmed at a minimum of a corrected level of $<.05$, with most reaching much higher significance (Table 1).

For male respondents, the mean length in words of the dreams was 92.8 with a standard deviation of 171.0. The predicted higher score for the variable health was the only one significant at as high a level as for women. Positive emotions, negative emotions, anxiety, and death differed from the normative sample in the predicted direction, but at lower significance levels than for women's pandemic dreams.

Positive emotions, negative emotions, anxiety, and death changed in the predicted direction at lower significance levels than the effects for women's

Table 1
Female Pandemic Survey Dreams Versus Hall and van de Castle Female Normative Dreams

LIWC category and content examples	Pandemic *M*	*SD*	Normative *M*	*SD*	*t*	*p*
Positive emotions: love, nice, sweet	1.11	1.82	1.48	1.52	4.64	<.0001***
Negative emotions: hurt, ugly, nasty	2.31	3.32	1.40	1.47	9.14	<.0001***
Anxiety: worried, fearful, nervous	0.76	2.20	0.46	0.74	5.05	<.0001***
Anger hate, furious, annoyed	0.42	1.32	0.31	0.64	2.66	.0078**
Sadness: crying, grief, sad	0.46	1.37	0.27	0.63	4.55	<.0001***
Biological processes: eat, blood, pain	2.43	2.87	1.80	1.97	5.75	<.0001***
Body: cheek, hands, spit	1.07	1.83	0.83	1.32	3.81	.0009**
Health: sick, cough, clinic	0.91	1.69	0.48	0.90	7.76	<.0001***
Death: bury, coffin, kill	0.51	1.75	0.15	0.52	7.89	<.0001***

Note. LIWC = Linguistic Inquiry and Word Count.
** Benjamini-Hochberg corrected $p < .01$. *** Benjamini-Hochberg corrected $p < .001$.

pandemic dreams. The variables anger, sadness, and body did not differ between the pandemic dreams and the normative sample (Table 2).

Discussion

The finding that all specific content hypotheses about LIWC scales were supported for women, and more than half the variables reached at least modest significance in the predicted direction for men, is a confirmation of the more general continuity hypothesis of dreams demonstrating consistency with waking concerns. Death was the variable with the largest difference for both genders: More than three times higher for pandemic dreams than normative ones. The reason it is even higher than anxiety may lie in the fact that waking reactions to the pandemic include not only obvious fears of dying of the virus but also reflections on human mortality and remembrances of deceased loved ones. Although some of the dreams with death-related words are classic horror-film fare—as with one woman who wanders into a mortuary which she gradually discovers is embalming live COVID patients—there were also peaceful references to death. One dreamer attended a lovely family picnic with beloved dead relatives; another had a visit from her deceased mother and aunt who told her it was "time to come with us," and she was happily led away.

The other striking result in the study was the gender difference in how much more pandemic dreams varied from the norms for women compared to the variance for men. Upon examination of the literature on waking gender differences of effects from the pandemic, the stronger effects for women's dreams are not surprising, and represent further confirmation of the continuity hypothesis. Women on average perform three times as much unpaid care work as men (United Nations Women, 2020a). They are more likely to be caregivers for the sick individuals in the family, making them more vulnerable to infection (Caprino, 2020). Globally, women make up 70% of health care workers. They occupy the lower salary/lower authority levels of these jobs on average and are less well-supplied with personal protective equipment (Wenham, Smith, & Morgan, 2020). In many countries, COVID-19

Table 2
Male Pandemic Survey Dreams Versus Hall and van de Castle Male Normative Dream

LIWC category and content examples	Pandemic male *M*	*SD*	Normative male *M*	*SD*	*t*	*p*
Positive emotions: love, nice, sweet	0.96	3.81	1.48	1.46	3.47	.0009**
Negative emotions: hurt, ugly, nasty	1.91	2.95	1.50	1.52	3.28	.0011**
Anxiety: worried, fearful, nervous	0.48	1.06	0.33	0.64	3.17	.0015**
Anger: hate, furious, annoyed	0.45	1.27	0.47	0.93	.33	.7506
Sadness: crying, grief, sad	0.34	1.37	0.27	0.53	1.32	.1953
Biological processes: eat, blood, pain	1.99	3.21	1.67	1.92	2.24	.0252*
Body: cheek, hands, spit	0.73	1.44	0.78	1.21	.67	.5032
Health: sick, cough, clinic	0.76	1.69	0.38	0.76	5.52	<.0001***
Death: bury, coffin, kill	0.74	5.33	0.23	0.67	2.67	.0077**

Note. LIWC = Linguistic Inquiry and Word Count.
* Benjamini-Hochberg corrected $p < .05$. ** Benjamini-Hochberg corrected $p < .01$. *** Benjamini-Hochberg corrected $p < .001$.

infections among female health workers are twice that of their male counterparts (United Nations Women, 2020b). Women are underrepresented in clinical trials for vaccines and drugs, and they are underrepresented in pandemic decision-making bodies (United Nations Women, 2020b).

Disease outbreaks increase existing inequalities between the genders (Wenham et al., 2020). During lockdown, women are at greater risk of domestic violence (United Nations Population Fund, 2020) and are disproportionately disadvantaged by reduced access to sexual- and reproductive-health services. Because women are more likely than men to have fewer hours of employed work and to be on insecure contracts, they are more affected by job losses, and women lost disproportionately more jobs since the onset of the pandemic (United Nations Women, 2020b). Women are reported to be suffering a greater increase in depression and anxiety since the beginning of the pandemic than are men (Özdin & Bayrak Özdin, 2020).

The women's dreams reflect both this general increase in stress and many of their specific challenges. Female dreams included a nanny who dreamed of the parents terminating their work-from-home arrangements to focus on the children and turning her out on the street. One mother who was home-schooling her 10-year-old dreamed that the school contacted her to say that the child's whole class was being sent to her condominium where she must home-school them all for the duration of the pandemic. The changes in LIWC categories of body only for women and biological processes much more strongly for women probably reflect dreaming about unwanted sexualization and lack of privacy consistent with their life in lockdown, and also dreams where the dreamer is pregnant and bizarre things related to the pandemic are going wrong with the pregnancy. Anger and sadness being higher for pandemic dreams of women only is consistent with their waking burdens of unpaid child and elder care of others and higher rates of job loss, while similarly higher scores for anxiety reflect that fear of illness is more equally shared with men.

The current study specifically focused on dreams that are related to the COVID-19 coronavirus. Other research is needed to address whether dreams in general during the pandemic differ from normative values, and whether the sex differences found here are seen also in dreams in general during the pandemic. Other limitations of the present study concern the characteristics of the survey respondents versus the normative dreamers. The survey was posted in English, and the pandemic respondents include a broad range of ages and some range of nationalities—especially other countries which utilize English as their first language, so their results generalize with most confidence to the anglophone world. The normative dreamers are younger and entirely American. These normative dreams' patterns of content and gender differences have been established as holding up well when compared to other ages and cultures on Hall and van de Castle variables (Domhoff, 2003). These variables have also been established to have high correlations to their equivalent LIWC categories (Barrett, 2015). So, it is clear the differences in pandemic dreams are not merely differences of age or nationality. However, it would be interesting to obtain a more similar international normative sample and examine whether different age groups or nationalities respond to the pandemic differently. The survey is ongoing, and it is anticipated that both more cross-nationality analyses can be done as the sample grows and that comparisons can be made between trends at the start, middle, and (hopefully!) the end of the pandemic.

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