Dream content during lucid dreams and out-of-body experiences, differences and similarities.

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ABSTRACT

During sleep, humans experience offline visual content that we call dreams, which are typically emotional and lack rational judgment about their strangeness. However, during lucid dreaming (LD), subjects know they are dreaming and can control the dream content. Another type of awere dream experience is the out-of-body experience (OBE) initiated from sleep paralysis. Although the differences between non-LD, LD and OBEs are evident, there is no record in the literature of such differences in dream content and some researchers describe OBEs as a type of LD. We conducted interviews with subjects who experienced LD and subjects who had OBEs frequently. A portion of them kept a dream journal for two months with precise instructions on how to write down their dreams. The collected dreams were analyzed by automatic methods of analysis of emotions such as EmoLex and Sentisense, also with classifiers such as Empath. The dream stories provided by the participants were scored with a series of ratings using a method based on Hall and Van de Castle's dream content scoring system upon which we developed variations and additional measures to adapt to the requirements of our task. The scoring was divided into sections, thought/emotion/action, presence of entities/characters and social interactions, sensory descriptions, spatial references, fantasy content, among others. Here we present the preliminary progress of this study of oneiric content.

METHODS

Participants.

Gender		Age
Female	97	34,81±10, 6
Male	76	33,13±11,5
Other	1	31
Total	**174**	

Dreams	
Normal	824
Lucid	122
OBE	68
Sleep Paralysis	15
False Awakening	9
Total	1034

63 of 174 completed a Dream Journal for 2 month.

The collected dream narratives were analyzed using three different methods.

Sentiment and Emotion Lexicons

Lexicon-based sentiment or Emotion analysis for any language is dependent on sentiment lexicons that are produced manually or semiautomatically and commonly stored as dictionaries.

SentiSense attaches emotional meanings to concepts from the WordNet lexical database, instead of terms, thus allowing to address the word ambiguity problem using one of the many WordNet-based word sense disambiguation algorithms.

The NRC Emotion Lexicon is a list of English words and their associations with eight basic emotions (anger, fear, anticipation, trust, surprise, sadness, joy, and disgust) and two sentiments (negative and positive).

Empath, (lexical categories)

A text analysis tool that analyzes text across 200 gold standard topics and emotions (e.g., *childishness* or *violence*), and can generate and validate new lexical categories on demand from a user-generated set of seed terms.

It is not *based* on a lexicon, but on neuronal network algorithms that combines modern NLP techniques with the benefits of handmade lexicons.

Makes a vector space from embeddings that measures the similarity between words, uses *seed terms* to define new words for each of its categories, and finally filters its categories using crowds.
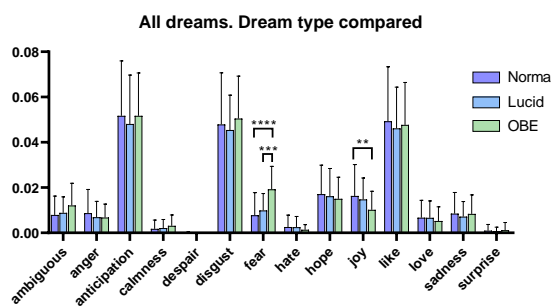
Oneiric Content Analysis

Through an experimenter's reading of dream reports, several empirical categories (and subcategories), such as "characters", "social interactions", "emotions", "sensations", "activities", among others, are recorded using a defined code that later are scored.

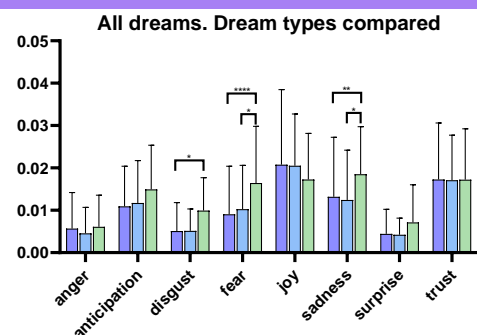Method *based* on Hall and Van de Castle's dream content scoring system

PRELIMINARY RESULTS

SentiSense

All dreams. Dream type compared

The NRC Emotion Lexicon

All dreams. Dream types compared

OBE have significantly more negative emotions.

Empath (some gold standard categories)

Emotions
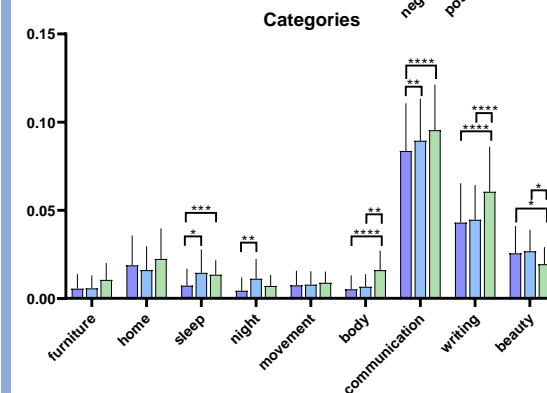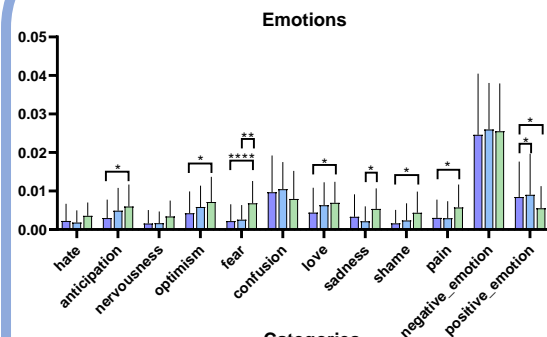
Categories

Differences are evident in various categories, indicating differences in content.

Oneiric Content Analysis

Lucidity score — Meta-References — Movement difficulties — Own Body references

Emotions — Sensations
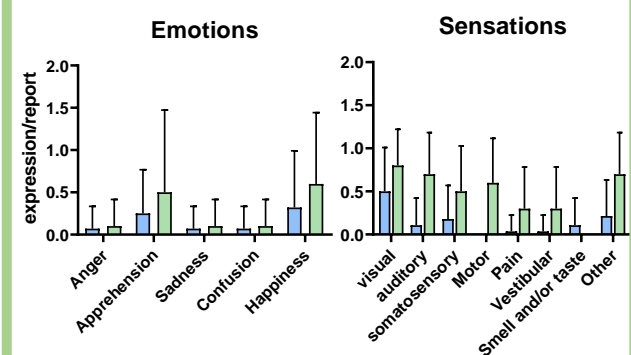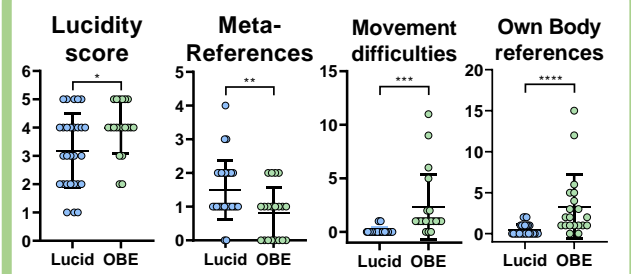
OBEs refer more often to their own movements and bodies. Lucid refer more to themselves and the dream environment.

FUTURE

- More Data
- Empath, custom categories.
- Comparisons between similar "lucidity" score.