The public' s Acceptance of Lucid Dreaming as a Scientific Topic

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Abstract

A Lucid dream (LD) is a dream in which the dreaming person knows that he or she is dreaming. Being neglected by scientific researchers for many decades, nowadays lucid dreaming is an acknowledged research field, which also has practical clinical implications, e.g. for therapeutic purposes. This online study investigates the public perception of lucid dreaming and its scientific exploration, in order to see whether the popular view reflects the scientific acceptance. 215 participants took part and were compared to an additional sample of 40 members of lucid dreaming internet forums. Main findings: 1. Lucid dreaming is viewed as a positive phenomenon in general. This is the case for all subgroups (i.e. general population, scientists, lucid dreaming experts, spiritual people). However, the lucid dreaming experts had a by far more positive view of lucid dreams than the average population. 2. LD research is accepted as being scientific 3. Lucid dreaming is classified as a medium exceptional phenomenon, comparable to hypnosis, and thus more exceptional than normal dreaming and meditation, but less exceptional than telepathy or clairvoyance. 4. Different aspects of lucid dreaming are estimated differently regarding: the broad population considers less aspects possible than science has already proven possible. Lucid dreaming forum members have a more realistic view on the topic than the average population. This overall positive view supports the use of LD for medical purposes.

1 Introduction

A lucid dream (LD) is a dream in which the dreaming person knows that he or she is dreaming. (van eden zitieren) LD as research topic is a relatively new field. The topic of LD has long time been considered esoteric or parapsychological and was not scientifically acknowledged. In 1936, the Journal of Abnormal Psychology (the title contains the word abnormal.) published the essay "Dreams in Which the Dreamer Knows He is Asleep", in which the author argued against some fellow psychologists who claimed lucid dreams were just daydreams (LaBerge, 1987, p.48). LD was considered esoteric or mistaken until Hearne and LaBerge proved the phenomenon existent by measurement [**?** **?**].

According to LaBerge (1987), "Lucid dreams got into unjustified proximity to ghosts, telepathy, flying saucers and other things that are considered superstitious nonsense by traditional science". The questions how to distinguish science from non-science is called the demarcation problem. The most common solution to it is formulated by Karl Popper in the 1970s: He stated that for a theory to be scientific it must be falsifiable. Today, falsification and repeatability are still seen as the classical criteria of demarcation [13, p.18]. A scientific research question must (among other requirements [1]) be potentially falsifiable. There must be conceivable events that contradict the hypothesis [3]. In 1980, Hearne and LaBerge (independent of each other) succeeded in satisfying the requirements by conducting an experiment in a sleep laboratory. They showed that a lucidly dreaming person can contact an observer by means of a previously appointed sequence of eye movement. LaBerge's study was finally published (in Perceptual and Motor Skills) and doubters were convinced that LaBerge's experiments were evidence of the existence of lucid dreaming (LaBerge, 1987, p.75 ff.). This huge change happened very late: Still in 1975 LD seemed so strange to dream researchers that they did not pay any attention [8, p.76].

But today, LD is content of modern science: several scientific institutions in the whole world conduct lucid dream research. Spoormaker et al showed a positive effect of lucid dreaming on overcoming nightmares. This is already being applied in practice[6]. Other applications of LD are scientific exploration, health and inner growth, creative problem solving, rehearsal and decision making, wish fulfillment and recreation [5, 7]. Today, well-known journals like nature neuroscience publish articles about LD [12, 9]

The goal of the present study was to find out whether the opinion of the population reflects the scientific view of LD as acknowledged research field. We collected information about the public state of knowledge and experience with lucid dreaming. Because LD has longtime been connected to parapsychology, we investigated how the phenomenon is valued with respect to its eventual paranormal features. Also, the research of lucid dreaming was assessed with regards to scientificity. Explicitly, we explored (1) How positive or negative LD is viwed by the general population and if differences in subgroups (scientific/unscientific, under30/30 and older, female/male, infrequent/frequent lucid dreamers, spiritual/non spiritual) exist. (2) How the research of lucid dreaming is estimated, rather scientific or unscientific (3) How the phenomenon is seen in comparison to other states of consciousness, e.g. hypnosis. (4) Which properties are attributed to lucid dreaming.

[1] For a research question to be scientific, it must fulfill four requirements: (1) It must refer to real circumstances that can be empirically tested. (2) It must be a universal claim, going beyond a single case. (3) It must have, at least implicitly, a formal structure like "if..., then...". (4) it must be potentially falsifiable. There must be conceivable events that contradict the hypothesis [3]. Popper's critical rationalism (Scientific theories can only be disprovable, but not provable, because there could be future instances of disproof.) is indeed the most common scientific frame model [3, p.22] and is still made use of in up-to-date literature [4].

2 Methods

2.1 Participants

385 participants were recruited via the internet platform Facebook, email and via asking people in the city of Osnabrück. We excluded students from the Cognitive Science program from participation, because they might have heard of the topic in class. Additionally, we posted the survey on three LD web pages: (1) www.klartraumforum.de (2) www.kt-forum.de and (3) www.facebook.com/Klartraumforum. They received no payment for participation.

2.2 Questionnaire

After reading an instruction text, they filled out an online survey consisting of 28 questions (questionnaire tool: LimeSurvey). Answering the questions took about 20 minutes. 270 participants (females: 156; age 30.9 $\pm$ Y) completely filled out the questionanaire. All participants who did not finish the questionnaire, were excluded from further analyses.

2.2.1 Previous knowledge about LD

We assessed the previous knowledge about lucid dreaming using the following questions (translated from German to English): Have you ever heard about lucid dreaming before this study? If you have ever heard about lucid draming before, where did you hear from it? How often do you experience a lucid dream?

2.2.2 Is LD a positive or negative phenomenon?

In two word rating tasks the subjects hat to rate how well presented words fit to (1) the phenomenon of lucid dreaming and (2) the research on lucid dreaming. The presented words can be found in Table 1.

Phenomenon LD		**LD research**	
Positive	**Negative**	**Positive**	**Negative**
desirable	abstruse	good	abstruse
good	bad	important	bad
insightful	dangerous	objectively provabl	esoteric
meaningful	esoteric	reasonable	stupid
measurable	insane	relevant	unnecessary
nice	morbid	scientific	unscientific
usual	supernatural	worthwhile	weird
verifiable	unnormal		

Table 1: Words of the word rating task for the phenomenon of LD and LD research. Displayed are the presented words in alphabetical order

2.2.3 Is LD research scientific or not?

see Table 1.

2.2.4 Comparison to other states of consciousness

In order to compare LD to other states of consciousness or mental activities, the participants had to decide for six items (non-lucid dreaming, meditation, hypnosis, spook, telepathy and clearvoyance) whether they think they are less, equally ot more extraordinary than lucid dreaming.

2.2.5 What is possible using lucid dreaming?

To detect what features or applications of LD are considered possible and which are considered impossible, the subjects were presented eleven short descriptions of situations which they had to estimate on a scale from 1 = not possible to 10 = totally possible. The questions cover several possible applications of LD (having a LD at all, showing the existence of LD in a sleep lab, learning in LD, sleep communication, talking to deceased people). The detailed content of the eleven situations are displayed in Table 2.

2.3 Statistical analyses

Data was devided into a broad population group (N=215) and a forum members group (N=40) in order to find out whether skilled lucid dreamers (or LD interested people) have a different view on LD and LD research. Analysis of only the broad population data allowed us to draw inferences about the spread and the opinion of lucid dreaming in the general public.

The broad population data (without LD forum members) was further arranged into groups following several characteristics. Gender: broad population data was divided into male (N = 66) and female (N= 141). Age: broad population data was divided into young (under 30, N = 134) and old (30 and up, N = 81). Scientific activity: broad population data was divided into scientific (N = 102) and non scientific (N=112). Spirituality: broad population data was divided into spiritual (N = 99) and non spiritual (N= 113). Experience: broad population data was divided into experienced (N = 46) and unexperienced (N= 169). Where two groups do not add up to 215, participants have not given answers to the corresponding question.

Statistical Tests : The 28 questions with, in parts, multiple subquestions yield in a total of 79 variable. The data was analysed using MATLAB R2014b and LibreOffice Calc (version 3.5.7.2 Build ID: 350m1(Build:2)). We defined correlations to be significant correlations at a p-value of 0.05 and below. When we speak of correlations in the results section and discussion, we mean significant correlations without explicitly mentioning it. Group comparisons were calculated with the means of co-existing groups. We decided to take the mean as main comparative value and not the median, because on a scale reaching from 1 to 5, extreme values do not act like outliers that falsely shift the value.

As significance tests we applied two-sample Kolmogorov–Smirnov tests, as well as t-tests and permutation tests. The mentioned p-values are those from the permutation test, if not stated differently. As a significance level we used an alpha of 0.05 for the permutation test (and alpha below 0.01 as strong significance). For the Kolmogorov–Smirnov test we included weak significance of p-values between 0.05 and 0.1. We mention only those differences as significant if both the two-sample Kolmogorov–Smirnov test and permutation test provide values below significance levels. The procedure was the following: If the Kolmogorov–Smirnov test delivered significant values, including weak significance, we proceeded with the t-test and permutation test. If the p-value of the permutation test was below 0.05, the respective comparison was mentioned as significant. Presumably, results of the permutation test are more reliable than those of the t-test, as the t-test has the assumption of underlying normal distributed data (which we do not have assured for our data), whereas permutation tests, also called randomization tests, do not have that assumption.

In order to test whether the phenomenon of lucid dreaming is viewed differently between various population subgroups, we computed per subject the sum of ratings of all eight positive words and subtracted the rating of all eight negative words. This difference is a measure for evaluation of the phenomenon. positive numbers indicate an overall more positive evaluation.

3 Results

3.1 Previous knowledge about LD

3.1.1 Have you ever heard about lucid dreaming before this study?

Of the broad population participants 54% have heard of lucid dreaming before taking part in this study (Of the 55 forum members, 100% have already heard of it) 64% of the scientific subgroup have heard of LD and 46% of the not scientific subgroup. 50% of the religous group have heard of the phenomenon, and 58% of the unreligous. 60%of the under 30 years old poeople have heard of LD and 44% of the 30 and older. Of the male participants 52 % have heard of lucid dreaming and 56 % of the females.

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3.1.2 If you have ever heard about lucid draming before, where did you hear from it?

jeweils für die untergruppen ———————- Concerning the way participants have heard of LD, many wrote "TV report" in a comment box, which is an option we did not think of when designing the questionnaire. However, the most mentioned source of information people rely on are reports of acquaintances, followed by scientific literature. The distribution of sources of information can be seen in Figure 1).

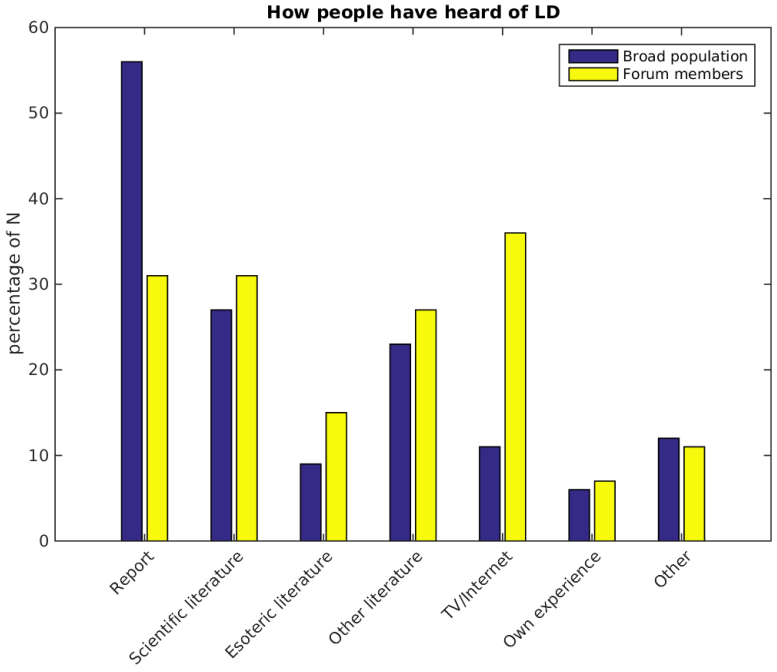

Figure 1: Where the participants have heard of LD. (multiple selection was possible)

The subjects were further asked what their answers were based on. The majority of the broad population participants (75%) have based their answers on gut feeling. 6% rely on scientific literature, not a single participant relies on esoteric literature, 2% chose other literature and 4% refer to reports of acquaintances. 13% chose "other" (which was explained in a comment and contained mostly own experience). Likewise the forum members claim to have based their answers on gut feeling (36%), scientific literature (33%) and other (31%), none of them chose esoteric literature, other literature or reports of acquaintances as answer.

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3.1.3 How often do you experience a lucid dream?

65 % of the broad population and 89 % of the forum members already had at least one lucid dream in their lifetime. We could not find age or gender effects on experience with LD in the general population: 65% of the under 30 years group and 64% of the 30 and older group have had at least one lucid dream; 67% of our male participants had at least one lucid dream and 64% of the females. –¿ + andere kategorien

3.2 Is LD a positive or negative phenomenon?

Regarding the general population (without forum members), lucid dreaming was associated more with the positive words than with the negative (see Table 3).

In order to have a comparable measure of the word rating task we computed per subject the sumof ratings of all eight positive words and subtracted the rating of all eight negative words. This difference is a measure for evaluation of the phenomenon. Positive numbers indicate an overall more positive evaluation. We found positive numbers for all groups, i.e. all groups evaluated the phenomenon of lucid dreaming as being something positive. Significant difference in evaluation were found between forum members and the broad population and between young and old people: Lucid dreaming forum members evaluated lucid dreaming considerably more positive than the average population, which however also had a positive evaluation. Comparing gender, no significant difference could be found between female and male participants. Also spiritual and non-spiritual participants ("Would you consider yourself being a religious or spiritual person?") did not evaluate the phenomenon significantly different. When comparing scientifically active and inactive people ("Do you currently work or study at a university or scientific institute?"), no significant difference could be found. Frequent lucid dreamers (one or more lucid dreams per month) neither estimated the phenomenon lucid dreaming significantly more positive or negative than infrequent lucid dreamers (see Table 4).

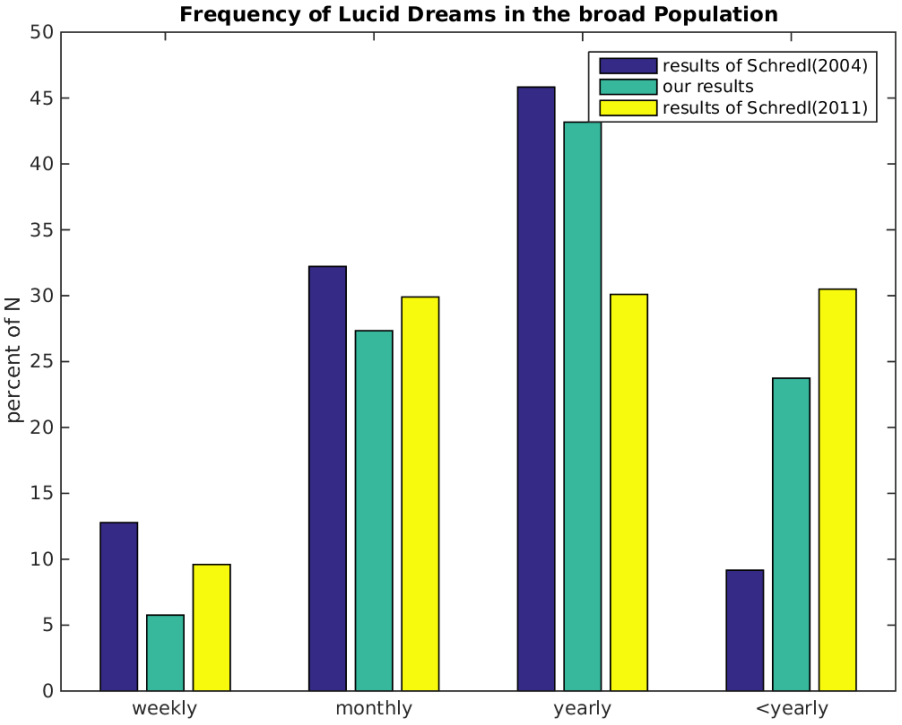

Figure 2: Caption

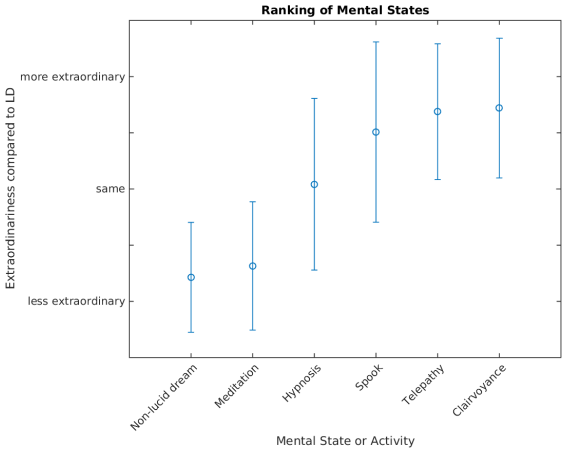

Figure 3: Comparison of LD and other mental states with respect to extraordinariness. For each item on the X-axis the subjects had to chose between (1) less, (2) equally or (3) more extraordinary than LD. Displayed are means and standard deviations of estimations of only the broad population group.

3.3 Is LD research scientific or not?

The same measure was computed for the evaluation of the lucid dream research (see Table 5). The LD research was estimated rather scientific and objectively provable and not esoteric or unscientfic.
——— hier die means der 14 worte angeben? When summing the positive words and subtracting the sum of ratings of neative words, we found remaining positive numbers for all groups, i.e. all groups evaluated the research of lucid dreaming as being something scientific (see Table **??**).. Significant difference in evaluation were found between broad population and forum members (p= $3.4106e^{-09}$).

3.4 Comparison to other states of consciousness

The subjects had to compare LD with other mental states or activities. For 5 mental states the subjects had to chose between (1) less, (2) equally or (3) more extraordinary than LD. They rated as follows: Hypnosis was estimated as exceptional as lucid dreaming (avg 2.0). Spook, telepathy, and clearvoyance were estimated more exceptional than lucid dreaming (avg 2.5, 2.7 and 2.7). Non-lucid dreaming and meditation were estimated less exceptional than lucid dreaming (avg 1.2 and 1.3, see Figure 3).

3.5 What is possible using lucid dreaming "Gradient"?

On a scale from "1 = subject is sure this is impossible" to "10 = subject is sure this is possible", subjects rated eleven situations which described different ap-

plications of lucid dreaming. Of the broad population data, the highest average value of 9.0 was attributed to the fact "somebody has a lucid dream", which means that most subjects were very sure that having a lucid dream is possible. Forum members showed a stronger belief, that this is possible, than non-experts (avg 9.9). For the item "somebody talks within a lucid dream with a deceased person", forum members were much more convinced, that this is acutally possible (avg 9.6), than non-forum members (avg 7.6). Similar results (avg 9.5 vs 7.5) were obtained for the item "a lucid dream can be measured and verified to be lucid in a sleep laboratory". The item "learning in LD" is considered less possible by the broad population (avg 5.5), whereas the forum members are sure this is possible (avg 9.4). Similarly, "communicating with an experimenter from within a LD" is considered halfway possible by the broad population (avg 5.3), but rather possible (avg 8.0) by the forum members. The communication the other way around, from an experimenter into a LD is rather not thought to be possible by the broad population (avg 4.5), but still considered rather possible (avg 7.5) by the forum members. Also considered rather not possible by the broad population is the item "Receiving information from a deceased person contacted through a LD" (avg 4.6), which is considered possible to some extend (avg 6.3) by the forum members. The item rated the least possible by both broad population group (avg 3.9) and forum members (avg 4.5) is "getting into an Out-of-boy-experience through LD". The evaluation of the situations for all subgroups is shown in Table 6.

4 Discussion

This study revealed a very positive attitude towards lucid dreaming in general. Independent of gender, age, scientific activitty, spirituality and LD experience, people consider LD something positive and also something that can be scientfically tested. Lucid dreaming experts had a by far more positive view of lucid dreams than the average population. Lucid dreaming is classified as a medium exceptional phenomenon, comparable to hypnosis, more exceptional than normal dreaming and meditation, but PSI phenomena like telepathy or clairvoyance are estimated more exceptional than lucid dreaming. Different applicationss of lucid dreaming are estimated differently: the broad population considers lucid dreaming for provable, but not sleep communication. Lucid dreaming forum members have a more realistic view on the topic than the average population.

Main result 1. Lucid dreaming is viewed as a positive phenomenon in general. We presented 16 Adjectives to the participants, of which were 8 positive and 8 negative. The subjects rated how well the words fit to the phenomenon of LD. All 8 positive words were given a higer rating than the negative words. Therefore we conclude that in general, the participants consider LD something good and worthwile. Of those people who have never experienced a lucid dream, 57 % would like to be able to dream lucidly and only 14% would not like it.
Main result 2: exceptionality

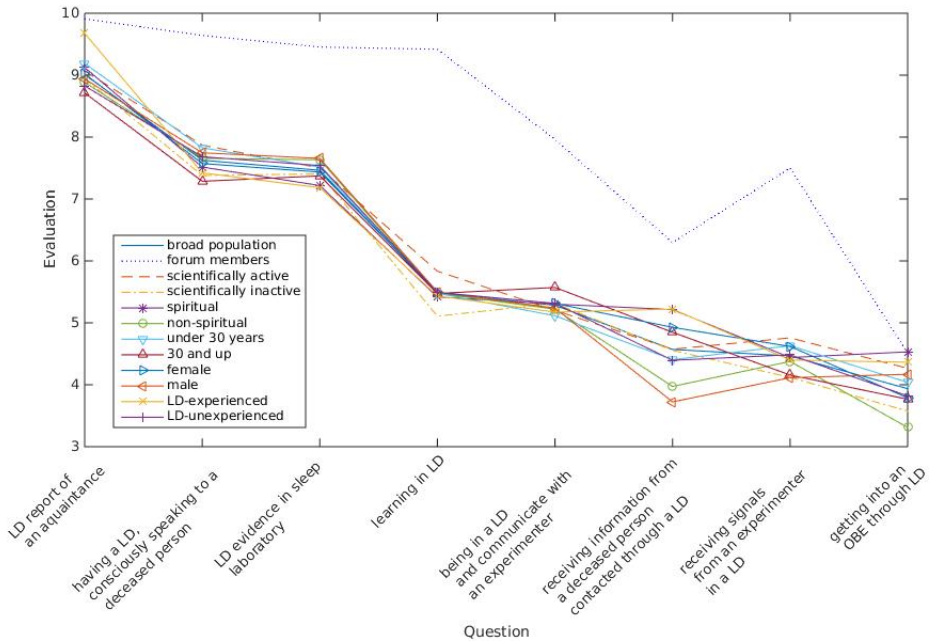

Figure 4: Evaluation of 8 situations describing an application of LD. The items are in descending order of the mean of all data. Plotted are forum members, broad population, as well as all subgroups of the broad population

Was will ich sagen: 1. LD so wie hyp, mehr als normales träumen und meditation und weniger als spuk, telepathie und hellsehen.

2. Das bedeutet, dass LD ein mittel aussergewöhnliches Phänomen ist, aber kein paranormales phänomen. Denn spuk, tele und hellsehen sind nicht erklärbare phänomene, die mit dem heutigen stand der wissenschaft nicht erklärbar sind. cite! da die teilnehmer LD als weniger außergewöhnlich ansehen, schließen wir, dass LD nicht als paranormal angesehen wird, was auch mit dem Stand der Wissenschaft übereinstimmt: LD ist in einer Person und nachweisbar. Aus unserer Sicht macht es also sinn, wie die Subjects entschieden haben.

3. Non lucid dreaming auf der anderen Seite ist ein so gängiges phänomen, das fast jeder oft erlebt. Also macht auch das Sinn diese als weniger besonders zu werten.

4. Vergleichbar ist LD laut der studie mit hypnose, oder dem state in den man dadurch kommt. das kommt auch schlüssig vor, denn die beiden states haben Ähnlichkeiten!

1 In this study, Lucid dreaming was classified as a medium exceptional phenomenon, comparable to hypnosis, and more exceptional than normal (non-lucid) dreaming and meditation, but not as exceptional as telepathy, spook or clairvoyance.

2. This means that LD is an extraordinary phenomenon, (which is congruent with congruent with [11] who found that LD is still seen as an exceptional mental state), but no paranormal ability. Telepathy, spook and clearvoyance are effects which can, to our knowledge, not be explained by the current understanding of the human brain and therefore belong to the paranormal abilities. Compared to these phenomena, LD was estimated less remarkable, thus we conclude that LD is considered no paranormal ability, which is congruent with the current state of science, since LD can be shown experimentally (quote!).

3. Non-lucid dreaming and meditation on the other hand are both mental states or activities that many people experience. (quote?). Therefore it also sensible that the participants rated these phenomena less extraordinary than LD.

4. The state one gets into when being hypnotized is a trance-like mental state that deviates from the default/basic conscious experience and can be called an altered state of consciousness. (quelle). Here, it was rated as exceptional as LD, which is understandable, since it is, like LD, an altered state of consciousness, in which the person can think about his/her own mental state (Metacognition).

(Ich will sagen, dass hypnose und LD aehnlich aussergewoehlich sind, dass das also Sinn macht, was unsere Teilnehmer gesagt haben).

Is lucid dream research estimated scientific? We aimed to find out whether LD is still seen in connection to esoterics and occultism and asked the participants how well the words esoteric, unscientific... fit to LD research. The mean answer was ... which leads us to conclude that LD research is seen rather scientific than unscientific. Science-theoretically speaking, whether LD research can be understood as parapsychology or not depends on the interpretation of the term parapsuchology: If we interpret parapsychology as "already/still partly represented at universities or content of research and/or teaching performed by

few university employees" [2, p.8], this interpretation includes LD research because it is a relatively new research field. But if we interpret parapsychology as PSI research and PSI as "interactions between an organism and its surrounding (or between two organisms) that are suggestive of an effect that seems to reach beyond our current understanding of the scope and function of sensorimotor channels" [2, p.138], then LD research is not included, because LD does not fall under the definition of PSI, as LD deals with interactions between an organism and itself. LD research does therefore not fall under the definition of PSI research and hence not under parapsychology. Main result 3. Different aspects of lucid dreaming are estimated differently: the broad population considers less aspects possible than science has already proven possible. Lucid dreaming forum members have a more realistic view on the topic than the average population. The lucid dreaming forum members can be seen as experts in contrast to the broad population, because they evaluate the different aspects of LD more realistic (congruent with the scientfic status). We presented short stories of applications of LD and asked the participants to evaluate how possible and provable they consider those applications. One of the applications that the broad population did not consider possible, but the forum members did consider possible is sleep communication: a method investigated by Kristoffer Appel (Ph.D. at the University of Osnabrück). During a sleep communication experiment stimuli, e.g. lights and tones are presented to a dreaming person, whose brain waves are recorded using EEG. The stimulus gets incorporated into the participant's dream. The dreamer decodes the message and answers by similar means: He/she encodes a message into a body signal, for example eye movement.

In REM sleep (when most of the lucid dreams occur), muscle movement is mostly inhibited, but eye movements occur in the wake world when the dreamer moves his/her dream eyes and can be recorded using EOG. For example the dreaming person sends the eye signal left, right, left, right, left, right, which was previously defined as "I am lucid" according to prior agreement with the experimenter [1].

Even after specifying this application in a following question, the broad population did not consider it possible.

Implications

The overall positive opinion of the phenomenon has clinical implications: LD can be used in psychotherapy [5]. The applications already vary from the treatment of night mares [10, 5] to borderline syndrome [5]. This applictaion of LD can be reinforced in view of the very positive attitude of the population, especially taking into account that the positive opinion is predominate in all different subgroups of the present study.

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Question code	**Content of the respective mini story**
report	whether a lucid dream is possible at all (q11)
evidence	whether the occurrence of a lucid dream can be proven in a sleep laboratory (q12)
sending1	whether a lucidly dreaming person can communicate with a wake observer (q13)
sending2	this communication is specified by explaining how the sleeper can move his eyes and thereby send a signal to the waking world (q14)
receiving1	whether an observer can send information into the lucid dream of a test person (q15)
receiving2	the sleep communication is explained further: the observer sends auditory signals standing for letters, like in the morse alphabet (q16)
deceased1	whether a non-lucid dream, in which somebody talks to a deceased person, can occur (q17)
deceased2	whether a lucid dream with the conscious decision to talk to a deceased person can occur (q18)
deceased3	whether a lucid dream, in which somebody receives information from a deceased person, which the dreamer could not receive without the dream, can occur (q19)
learning	whether learning effects in lucid dreams can occur (by consciously exercise a task during lucid dreams and perform better the next day) (q20)
OBE	whether it is possible to have a out-of-body experience and enter another world during a lucid dream(q21)

Table 2: Question codes of the 11 situationss and short discriptions. The numbers in brackets refer to the exact formulation of all questions as presented to the subjects; this can be found in the appendix.

Word	**Mean**	**Word**	**Mean**
good	3.6	abstruse	2.5
nice	3.6	insane	1.8
insightful	3.5	supernatural	1.7
desirable	3.2	unnormal	1.7
verifiable	3.0	esoteric	1.7
meaningful	2.9	dangerous	1.6
usual	2.7	bad	1.4
measurable	2.5	morbid	1.2

Table 3: Results of the word rating task for the phenomenon(q7). Displayed are the means of the evaluation, sorted descending. Only broad population data taken into account. Possible answers were 1(not at all) - 5(totally).

Group	**evaluation (Mean)**	**p-value**
Broad population	11.26	p=
Forum members	21.05	$4.4955e^{-17}$
under 30	10.31	
30 and older	12.83	p = 0.0182
scientifically active	10.42	
not scientifically active	11.96	p = 0.1380
male	10.85	
female	11.32	p = 0.6814
spiritual	10.68	
not spiritual	11.56	p = 0.3989
frequent	12.87	
infrequent	10.82	p = 0.1049

Table 4: Results of the word rating task 1. Averaged evaluation of the phenomenon. Comparison between groups

Group	**evaluation (Mean)**	**p-value**
Broad population	14.46	
Forum members	21.11	p = $3.4106e^{-09}$
under 30	14.30	
30 and older	14.72	p = 0.7390
scientifically active	13.82	
not scientifically active	14.93	p = 0.3635
male	13.26	
female	15.18	p = 0.1428
spiritual	13.68	
not spiritual	14.96	p = 0.2934
frequent	14.17	
infrequent	14.53	p = 0.8087

Table 5: Results of the word rating task 2. Averaged evaluation of the research. Comparison between groups

Word	**broad population (Mean)**	**forum members (Mean)**	**significance**
report	9.0	9.9	**
evidence	7.5	9.5	**
sending1, possible	5.3	8.0	**
sending1, provable	5.2	7.4	**
sending2, possible	5.1	9.3	**
sending2, provable	5.4	9.3	**
receiving1, possible	4.5	7.5	**
receiving1, provable	4.5	7.3	**
receiving2, possible	4.2	7.4	**
receiving2, provable	4.5	7.5	**
deceased1, possible	9.1	9.2	
deceased1, provable	5.0	4.5	
deceased2, possible	7.6	9.6	**
deceased2, provable	4.9	5.3	
deceased3, possible	4.6	6.3	**
deceased3, provable	3.3	3.4	
learning, possible	5.5	9.4	**
learning, provable	4.6	8.3	**
OBE, possible	3.9	4.5	
OBE, provable	2.7	2.2	

Table 6: Means of the mini story evaluation, broad population compared to forum members. Significant differences are displayed by * (strongly significance by **). Possible answers were 1(not at all) - 10(totally).