Who are the people in my dreams? Self-awareness and character identification in dreams

Dagna Skrzypińska & Monika Słodka

Department of Psychology, Jagiellonian University, Krakow, Poland

Summary. Self-awareness and the ability to recognize other people are essential in everyday life. The main goal of the paper is to answer a question of how characters (the dreamer and others) that appear in dreams are recognized. The research was conducted to determine the main features of dream character identification, as well as the main modalities that can be helpful in this process. 153 participants were asked to write down the last dream they remember and to fill in the questionnaire of dream character recognition. The Hall/Van de Castle Coding System was used to examine the dream content. Results reveal that all participants were present in their dreams and identified themselves basing mainly on "the feeling of being myself/just know" or on the first-person perspective. Participants recognized other dream characters mostly due to their appearance, behaviour and the feeling of "knowing" that these individuals are certain persons from their daily life. The research confirms the prevalence of known characters in dreams and the similarity of cognitive processes in self- and character identification in dreaming and in the waking state. Additionally, cross-cultural comparison of dream content in Poland and USA is described, and future research directions, and limitations of the study are discussed.

Keywords: self-awareness; character identification; dreaming

1. Introduction

Dreaming is an important state of consciousness that complements the awake state. Self-awareness as well as the ability to recognize other people are essential in everyday life. Many conceptualizations of self-awareness that combine cognitive, physical, experimental and memory aspects of subjectivity have been created to date, often differing in minor details. In the paper only some of them, most relevant to the research, are introduced.

In psychological terms, self-awareness is a "sense of ownership of our subjective experience" (Farthing, 1992, pp. 6, and 42). According to the descriptive model of levels of consciousness (Farthing, 1992), self-awareness is a part of both primary and reflective consciousness. Primary consciousness includes "the direct experience of percepts and feelings and thoughts and memories arising in direct responses to them" (Farthing, 1992, pp. 12), while reflective consciousness consists of "thoughts about one's own conscious experience per se" (Farthing, 1992, pp. 13). For Mitchell (2003, pp. 568) in the state of self-awareness, a person shifts their focus from "the unreflective self into an observing self that attends to its internal mental states". Another important distinction was proposed by Fenigstein, Scheier and Buss (1975). The authors assume that an individual who is self-aware may focus on private or public self-aspects. Private self-aspects are events and characteristics unobservable to others such as emotions, perceptions, motives or physiological sensations, whereas public self-aspects consist of visible attributes such as behavior or appearance. In summary, the most general definition of the self-awareness state that can be inferred from these theories can be formulated as follows: it is a capacity to focus attention on self and to process private and public information about self. While most of the theories describe self-awareness in the waking state, some conceptions about self-awareness while dreaming were also formulated. There are two main theories that refer to the latter condition (Kozmová & Wolman, 2006). The first one is connected with the recognition of the dreaming state when dreaming. This experience is called "lucid dreaming" and its definition implies that this is a rare but robust awareness of an individual that they are dreaming and not really awake (Gackenbach & LaBerge, 1988). The second understanding of self-awareness in dreaming is connected with intrapsychic recognition, "the awareness of being oneself" within a dream (Cicogna & Bosinelli, 2001, pp. 26).

In their research, Kozmová and Wolman (2006) tried to find out whether self-awareness in dreams can be incorporated into models of primary and reflective waking self-awareness. They revealed that there are four main modalities of self-awareness in dreaming: 1. awareness of visual, auditory and kinesthetic properties, 2. experiencing through intuition or feelings, and 3. involvement in situations, thinking or awareness of this process as well as awareness of memory-related facts. Kozmová and Wolman (2006) reported that self-awareness of at least one these types was present in 95.6% answers of participants who took part in their study. Similar results were obtained in research by Snyder (1970) who described that the "all-important I" appears in 95% of narratives and by Cicogna and Bosinelli (2001) who

Corresponding address:
Dagna Skrzypińska, Institute of Psychology, Jagiellonian University, al. Mickiewicza 3, 31-120 Krakow, Poland.
Email: dagna.sk@gmail.com

Submitted for publication: January 2014
Accepted for publication: April 2014

reported that "awareness of being oneself" is present in 90% of narratives. The most frequent style of phenomenological self-awareness reported by participants was to rely on perceptual experiences (men = 74.3%, women = 97.2%), then respectively: on experimental (men = 53.0%, women = 81.8%), cognitive (men = 38.3%, women = 55.8%) and memory-based recognition (men = 12.7%, women = 32.5%) (Kozmová & Wolman, 2006).

Self-awareness is closely connected with the self-recognition of a dreamer. However, in 95% dream reports from laboratory awakenings there is at least one character other than the dreamer (Domhoff, 2005), and on average almost four people (including the dreamer) appear in one dream (Hall & Van de Castle, 1966). Another important issue that we would like to raise in the paper is character identification in dreaming.

The recognition of characters in dreams of non-clinical populations often bases on different cues than it's waking consciousness counterpart (Hobson, Hoffman, Helfand & Kostner, 1987). For example, there are known cases of phenomenological experience of delusions or misidentifications in dreams (Gerrans, 2012).

The systematic studies about character recognition in dreams reveal that participants more often classify them as known than unknown. When a dream character is recognized as known to the subject by name, the identification is based on: appearance, face, behavior, social role, relationship to a dreamer and logical deduction (Kahn, Stickgold, Pace-Shott & Hobson, 2000; Kahn, Pace-Shott & Hobson, 2002). Dream characters are also recognized by feelings evoked in a dreamer and feelings evoked between dream individuals (Kahn, Pace-Shott & Hobson, 2002). The sense of "I just knew who it was" is very common cue in dream character identification (Kahn, Stickgold, Pace-Shott & Hobson, 2000).

Recognition of self and others is based on, among others, autobiographical and episodic memory, emotional and evaluative systems and perceptual cues (McNamara, McLaren & Durso, 2007). The main goal of the present study is to reveal how characters (the dreamer and others) that appear in dreams are recognized. In the paper we also focused on the similarities and differences in dream self-awareness and dream character identification between men and women. Additionally, we conducted the cross-cultural research of selected dream content by comparing results obtained from Polish sample with American norms, as research in self-awareness and character identification in dreams has never been conducted in Poland before.

1.1. Hypotheses and research questions

The hypothesis and research questions about self-recognition in a dream were formulated as follows:

H1: Dreamer is present in her/his dreams as one of the characters or as an observer.

RQ1: What kind of cues are used by dreamers to recognize themselves in their dreams?

The hypothesis and research questions about recognition of characters other than the dreamer in a dream were formulated as follows:

RQ2: How many characters occur in a dream on average?

RQ3: What kind of cues are used by dreamers to recognize other dream characters?

H2: In a dream there are more characters that are known than unknown to the dreamer.

RQ4: How are known characters changed in dreams in comparison to the waking state?

2. Method

2.1. Participants

The 153 participants which answered an open announcement on the Internet took part in this study (58 men and 95 women). Women and men were asked to write their last remembered dream and fill in the questionnaire of dream character recognition.

2.2. Dream Recording Procedure

Participants were asked to write their age, sex and level of education. After that, participants described their last remembered dream, regardless of the time when it was dreamt. In particular, participants were asked to describe a setting of the dream (and indicate if it was a familiar place or not), people in the dream (including their age, sex and relationship with the dreamer), animals (if any appeared in a dream), and emotions experienced during the dream (additionally indicating whether they were pleasant or not). Hall/Van de Castle analysis was used to analyse the reports. It was carried out by 2 judges who have had large previous experience with this system.

2.3. Self-awareness and character recognition

Firstly, participants were asked about themselves in their dreams. They were asked to answer two open questions: "Do you appear in your dreams?" and "How do you know that it is you?". Then, participants had to fill in the table about recognizing other characters in their dream, based on the questionnaire created by Kahn, Pace-Schott and Hobson (2002). Participants were asked to list all dream characters and indicate the basis on which they recognized them (it was possible to select more than one option from a list of 12 cues [see the results]). Another part of the table concerned identification of the dream characters. Participants stated whether each of the dream characters was familiar from everyday life or not. If they knew the dream character, they filled in one more part of the table, where they were asked to indicate the extent to which the form of each character in dream was different from the one they knew from everyday life (it was possible to select more than one option from a list of 16 cues [see the results]).

2.4. Statistical analyses

Data sets from the questionnaire and demographic data were analysed using IBM SPSS 20.0 and Microsoft Excel 2007. The Hall/Van de Castle Coding System was used to examine the dream content. The system was used to code following categories: characters, social interactions (aggression, friendliness, and sexual interactions), activities, success or failure, misfortune or good fortune and emotions. Frequency of each type of content and their ratios and

Table 1. Statistically significant differences between male and female participants in the study and norm participants.

	Percentage	Norm	h-value	N
Female participants				
Characters				
Dead & Imaginary Percent	0.4%	0.1%	+0.22**	448
Social Interaction Percents				
Aggression/Friendliness Percent	73%	51%	+0.46**	109
Physical Aggression Percent	57%	34%	+0.46**	111
Dreams with at Least One:				
Friendliness	25%	42%	-0.36*	95
Male participants				
Characters				
Dead & Imaginary Percent	0.4%	00%	+0.27**	240
Dreams with at Least One:				
Misfortune	17%	36%	-0.43*	58

Note. *p<.01, **p<.001

indices were calculated using the spreadsheet DreamSAT created by Schneider (2008). The differences between the group of women and men and comparison of these data sets with norms were tested using h statistics, indicating the size of the effect (Domhoff, 1996). Presented results are compared to the American norms based on the research by Hall and Van de Castle (1966).

3. Results

3.1. Sample characteristics

153 participants took part in the study. Participants range in age from 18 to 53, the mean age was 24.1 years (*SD* = 3.4). Their level of education varied. Most participants graduated from a university (higher education, n = 75; 49%), some of them were students (n = 52; 34%), and the rest of them had secondary education (n = 26; 17%). All participants were unpaid volunteers.

3.2. Dream content

The average length of the narratives of the dreams were 227 words (*SD* = 198.3, range: 29-1422). In order to prevent type I error, Bonferroni correction was used, calculated as follows: the agreed significance level ($p < .05$) was divided by 22 (the number of multiple comparisons we performed to test each hypothesis). Obtained p-values were tested against the adjusted significance level (.0023). Significant results are described in the Table 1 and details are shown also in Appendix 1 and 2.

In Hall/Van de Castle system, befriender is defined as a friendly act involving support, help or any other type of kind act toward another character. It was found that dead/imaginary characters ($p < .001$) appeared more often in dreams of tested women than in norm participants. There were also more aggressive and friendly interactions ($p < .001$) and physical aggression ($p < .001$) than in norms group. Moreover, participants had fewer dreams with at least one "friendliness" event ($p = .001$) than norm group. For men, it was found that dead/imaginary characters ($p = .001$) appeared in dreams more often than in norms participants. There were also less dreams with at least one misfortune ($p = .002$).

Comparison of dream content between sexes: The differences between the group of women and men were tested by using h statistics, indicating the size of the effect (Domhoff, 1996). It was found that there are significantly more family members in women's dreams than in men's dreams ($p < .001$). This was the only significant difference in dream content in terms of gender differences (see Appendix 3.).

Self-recognition: All participants wrote an affirmative answer to the question whether they appear in their dreams. Qualitative analysis was conducted to divide the answers to next open-ended question – how participants know that they are themselves in their dreams. Each participant could have answered this question using more than one category. 17 categories of known possible self-recognition cues were specified. The frequency of answers for each category (N) and examples of the answers are described in the Table 2.

Categories to which most of the responses were assigned are: "the feeling of being myself/I just know" (20.3%), "first-person perspective" (19.8%), "third-person perspective" (10.5%), "appearance" (9.3%) and "social tips" (9.3%).

Recognition of other dream characters: The participants reported 441 dream characters altogether in the provided table, as compared to results obtained by the Hall and Van de Castle's system, where 688 dream characters were coded by the judges. The average amount of characters in participants' dreams was 2.9 (*SD* = 2.6, range: 0-19). For each of the dream characters, participants were asked to record how the character was identified. The frequency (%) of choices is shown in Table 3. Each person pointed on average 6.8 of choices.

The most frequent choices are: "the character's appearance" (25.2%), "I just knew it was him/her" (16.3%), "the character's behavior" (12.8%), "the way the character made me feel" (12.6%) and "the character's relation with me (e.g., my wife) (7.4%).

Table 2. The frequency of each category of self-recognition cues in dreams and examples of answers.

Category	N of answers	% of answers	Example
First-person perspective	47	19.8%	Participant 8: "I see the world from the perspective of myself."
Appearance	22	9.3%	Participant 97: "I see my hands, feet, clothing, reflections in windows, etc."
The feeling of being myself/I just know	48	20.3%	Participant 113: "I just know it is me, I have no doubt about that, but I do not know if I can explain it when I'm awake."
Experiencing me as me	18	7.6%	Participant 50: "Basing on my appearance, and whether I identify with what I say, what I experience."
Social cues	22	9.3%	Participant 42: "I see everything from my own perspective, I meet people I know and they refer to me as usual, so I assume that I am I."
Correspondence to the reality	11	4.6%	Participant 21: "I'm aware of what I do because others talk to me the same way as they do in the real life."
Third-person perspective	25	10.5%	Participant 111: "Sometimes I see myself from the outside, but never for the duration of the whole dream."
Knowing when I'm not myself	1	0.4%	Participant 19: "It is easier for me to say when I'm not myself - when I dream of completely unrealistic events with unreal characters, I know that I am someone else."
Voice	3	1.3%	Participant 72: "I see everything from my own perspective, I have my own voice, and my own appearance."
Bodily sensations	4	1.7%	Participant 73: "Basing on feelings, emotions and thoughts that pop up in my dream (e.g., if I dreamed that a dog bit me, I'd felt it in a way)."
My own behavior	9	3.8%	Participant 122: "I feel that I'm in control of my behaviour."
Thinking similarly to being in the waking state	2	0.8%	Participant 44: "I recognize myself by the fact that I act and think and feel as if I was awake."
Emotional cues	10	4.2%	Participant 121: "I saw myself, and I felt that it was me because I experienced strong emotions".
Being the center of attention / everything refers to the dreamer	1	0.4%	Participant 67: "I am the main character, all events are related to me."
Consciousness in a dream	2	0.8%	Participant 76: "I dream very consciously, I am able to control the course of events in a dream, and wake up anytime I want, as I am aware it is a dream all the time."
Control over events	4	1.7%	Participant 100: "I control my behavior and utterances."
Active role in the events	8	3.4%	Participant 86: "In general, I do not see myself in a dream, I only participate in it."

Discrepancies between a dream character and its waking counterpart: The participants were asked whether each of the characters in their dreams is familiar to them or not. It was found that 59.9% of them were known in everyday life (N = 264 characters). For familiar dream characters, women and men were asked to indicate differences between familiar dream characters and their waking counterparts. Each person reported on average 1.4 differences, chosen from the list of known possible discrepancies. The frequency (%) of choices is shown in Table 4.

The most frequent answers were: "there were no differences between the dream character and the real person" (44.0%), "the character had a different behavior from the real person" (12.0%), "the feelings/emotions evoked in me differed from those which would have been evoked by the real person " (8.5%), "relationship I had with the character in the dream was not the same as it is in real life" (6.7%) and "the dream character was a blend of two or more known characters from the real life" (5.4%).

4. Discussion

The main goal of this study was to define how participants recognize themselves and other characters in their dreams. Firstly, we conducted the content analysis using Hall and

Table 3. The frequency of occurrence of recognition cues for other characters in dreams.

Dream character recognition cue	%
1. Identification was based on the character's appearance	25.2
2. Identification was based on the character's behavior	12.8
3. I made a logical deduction about who the character was	6.3
4. The way the character made me feel	12.6
5. The way the character seemed to feel to ward me	5.5
6. The way the character seemed to feel to ward another dream character	3.4
7. I just knew it was him/her	16.3
8. Identification was based on the character's relation with me (e.g., my wife)	7.4
9. Identification was based on the character's social role (e.g., a judge)	3.2
10. I can't remember how I recognised the character	0.6
11. Identification was based on some other aspect of the character	1.6
12. I didn't recognize the character	5.1

Table 4. The frequency of reported discrepancies between a dream character and its waking counterpart.

Known possible differences	%
1. The dream character differed from the person they represented in real life in that the dream character had a different name	2.7
2. The dream character was a blend of two or more known characters from the real life	5.4
3. The character in the dream was dead/alive, while in the real life it was not the fact	2.7
4. The character in the dream was of a different gender than the real person	0.8
5. Age of the character was different than age of the real person	3.3
6. The health status of the character differed in the dream from his/her health status in the real life	1.9
7. The character had a different appearance from the real person	2.7
8. The character had a different behavior from the real person	12.0
9. I was convinced that the character had been replaced by a stranger, but she/he looked exactly like someone I know	0.5
10. I believe that different-looking characters in the dream were one and the same person	0.3
11. The feelings/emotions evoked in me dif fered from those which would have been evoked by the real person	8.5
12. Relationship I had with the character in the dream was not the same as it is in real life	6.7
13. The character's social role differed from that of the real person	3.0
14. The characters differed from that of the real person in waking in some other way (please specify)	3.0
15. Dream character differed from waking counterpart but I can't specify how exactly	2.5
16. There were no differences between the dream character and the real person	44.0

Van de Castle's system (1966). We observed some differences between Polish participants and American norms. It was found out that in female group there were more dead/imaginary dream characters. There were also higher aggression/friendliness and physical aggression percent than in norms group. Women had fewer dreams with at least one friendliness event than the norms group. In men's dreams dead/imaginary characters occurred more often than in norms participants. There were also more men's dreams with at least one misfortune event. Comparing dream content of female and male dreams brought some statistically significant difference between the two groups: in women's dreams there were significantly more family members than in men's dreams, which is consistent with previous studies (Moorcroft, 2003).

One of the possible explanations of these differences can be the fact that research group was probed from Polish population. These results are very interesting, but further studies on larger groups are needed to replicate them. It is worth noticing that 668 dream characters were coded in the spreadsheet DreamSAT (Schneider, 2008) by the competent judges, while participants reported 441 dream characters in the questionnaire. This difference could be induced by using the table – it is possible that participants mentioned only the most distinctive and/or important dream characters in the questionnaire. Rest of them was only mentioned in the description of the dream. What is more, participants and competent judges used different criteria by which they specified the dream characters. The judges coded dream characters according to the Hall and Van de Castle system. As defined by the original authors, "characters consist of people, animals, or mythical figures" (Hall and Van de Castle, 1966, pp. 52). Participants might have understood what a dream character is differently. For example, some of them skipped animals or other creatures. What is more, in some cases they listed only the most important dream characters, excluding the less important ones.

All participants claimed that they were one of the characters in their dreams. This result is consistent with previous studies (Kozmová & Wolman, 2006; Snyder, 1970; Cicogna & Bosinelli, 2001) and suggests existence of a cross-cultural, universal phenomenon of the occurrence of a dreamer in his dream. The most frequent category to which answers

to question "How do you know that it is you?" were assigned is "the feeling of being myself/I just know" (N = 48). In the study by Kahn, Stickgold, Pace-Shott and Hobson (2000) this type of answer was very high according to identifying dream characters named and generically. The next most frequent answers to this question in the current study are: "first-person perspective", "third-person perspective", "appearance" and "social tips". They seem to be similar to the results obtained by Kozmová and Wolman (2006). They found out that women recognized themselves in dreams basing on perceptual experiences (97.2%), as well as on experimental (81.8%), cognitive (55.8%) and memory-based recognition (32.5%). First- and third-person perspective is comparable with their definition of experimental recognition, and appearance with perceptual experiences. The "social tips" category, on the other hand, seems to be very complex. It is likely, however, that cognitive and memory-based cues are involved in using social point of recognizing oneself in a dream.

In the current study the average number of characters in participants' dreams was approximately equal to 3 (exactly 2.9; range: 0-19). According to Hall and Van de Castle (1966) on average, almost four people appear in one dream. Participants were asked to record how each dream character was identified. The most frequent choices were: "the character's appearance", "just knew it was him/her", "the character's behavior", "the way the character made the subject feel" and "the character's relationship aided in identification (e.g., my wife)". All of these answers seem to relate to cognitive, perceptual and emotional/social clues. Analogical results were described by Kahn, Stickgold, Pace-Shott and Hobson (2000) and Kahn, Pace-Shott and Hobson (2002) – according to these studies, dream characters are recognized by feelings evoked in dreamer and feelings evoked in dream individuals by other dream characters (Kahn, Pace-Shott & Hobson, 2002), while generic characters were identified by: appearance (39%), behavior (38%) and face (9%) (Kahn, Stickgold, Pace-Shott & Hobson, 2000). The answer "I just knew who it was" also appeared very often in relation to named and generically identified characters (44% and 40% accordingly) (Kahn, Stickgold, Pace-Shott & Hobson, 2000). Kahn, Pace-Shott and Hobson (2002) suggest that emotions are almost always evoked by dream characters and that they are often used as a basis of identification. They also hypothesized that dream character recognition characterized as a "just know" might reflect to a rapid feeling-based identification. Their hypothesis was that feeling is basic for knowing (Damasio, 1996), and they tested it by exploring how feeling is related to recognition of dream characters.

In this study, 59.9% of characters were known from everyday life (N = 264). Similarly, previous studies about character recognition in dreams inform that participants more often classify dream characters as known (48-50%) than unknown (16-25%) (Kahn, Stickgold, Pace-Shott & Hobson, 2000; Kahn, Pace-Shott & Hobson, 2002). This result may suggest the existence of a universal, cross-cultural tendency of appearance of a larger number of people known in dreams than the unknown ones. Almost half of the answers to the question about similarity of the form of each character in dream their everyday life counterparts was: "no discernible differences between dream character and waking counterpart" (44.0%). Existence of majority of familiar characters in described dreams and lack of differences between a dream character and its waking counterpart might be explained in terms of the hypothesis of continuity in dreams (Hall & Nordby, 1972), which states that subjects usually dream about familiar things, and people that are similar to these known from everyday life. Furthermore, despite the fact that the recognition of characters in dreams is usually different from that of the waking state (Hobson, Hoffman, Helfand & Kostner, 1987) and that there are single cases of delusions or misidentifications in dreams (Gerrans, 2012), there are almost no such results in this study. We obtained very low percent of answers to two questions about misidentifications – "I believe that different-looking characters in the dream, it is one and the same person" (0.27%) and "I believe that the character has been replaced by a stranger, but she/he looked exactly like someone I know" (0.54%). Due to the fact that question about misidentifications is in fact an exploratory one, there are at least two possible explanations of these results. Firstly, participants could have misunderstood these answers, and secondly, the misidentifications can be a marker of a psychopathological condition and might be present primarily in dreams of clinical population. More studies are needed to refer to these assumptions.

4.1. Limitations of the study

The nature of the research sample and the methodology sets limitations to interpretation of the findings. One of our goals was to compare how men and women recognize themselves and other characters in their dreams, but fewer results from men were collected, as they were less likely to participate in the study. Moreover, the subjects were recruited to the study through the Internet. This way of obtaining results is connected with some types of biases, such as: selection bias, information bias and confounding bias (Janssens & Kraft, 2012). It is suggested, that because of such limitations, obtained results and conclusions should be interpreted with caution.

In further research, we would like to focus on comparison of dreaming process and waking process as well as relate conclusions to the field of consciousness.

References

Cicogna, P., & Bosinelli, M. (2001). Consciousness during sleep. Consciousness and Cognition, 10, 26-41.

Damasio, A. R. (1996). The somatic marker hypothesis and the possible functions of the prefrontal cortex. Philosophical Transactions of the Royal Society of London B, 351, 1413–1420.

Domhoff, G.W. (1996). Finding meaning in dreams, A quantitative approach. New York: Plenum Press.

Domhoff, G.W. (2005). The content of dreams: Methodologic and theoretical implications. In: M. H. Kryger, T. Roth, & W. C. Dement (Eds.), Principles and Practies of Sleep Medicine (4th Ed., pp. 522-534). Philadelphia: W. B. Saunders.

Farthing, G.W. (1992). The psychology of consciousness. Engelwood Cliffs, NJ: Prentice Hall.

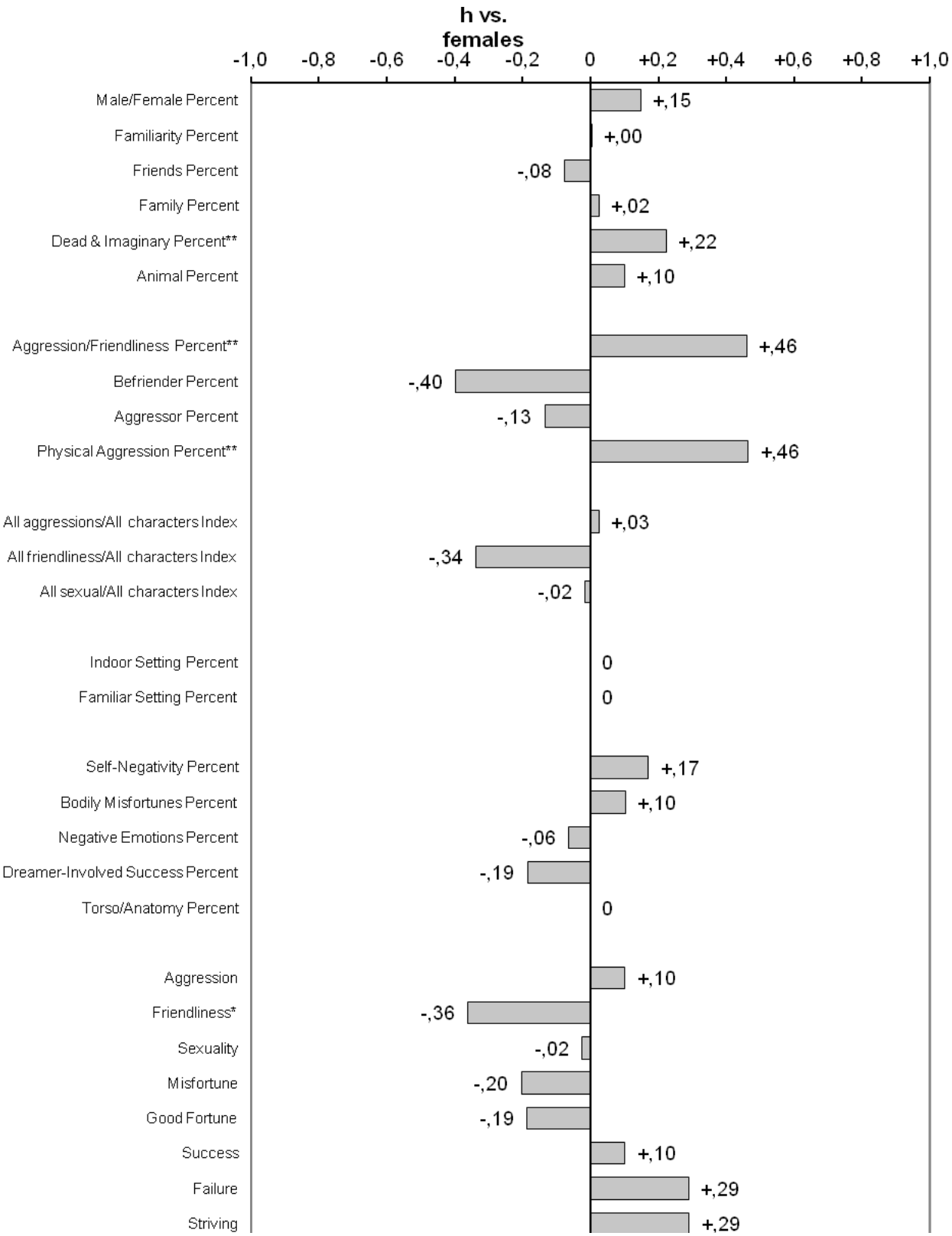
Fenigstein, A, Scheier, M.F., & Buss, A.H. (1975). Public and private self - consciousness: Assessment and theory. Journal of Consulting and Clinical Psychology, 36, 1241-1250.

Gackenback, J., & LaBerge, S. (1988). Conscious Mind, Sleeping Brain. New York: Plenum Press.

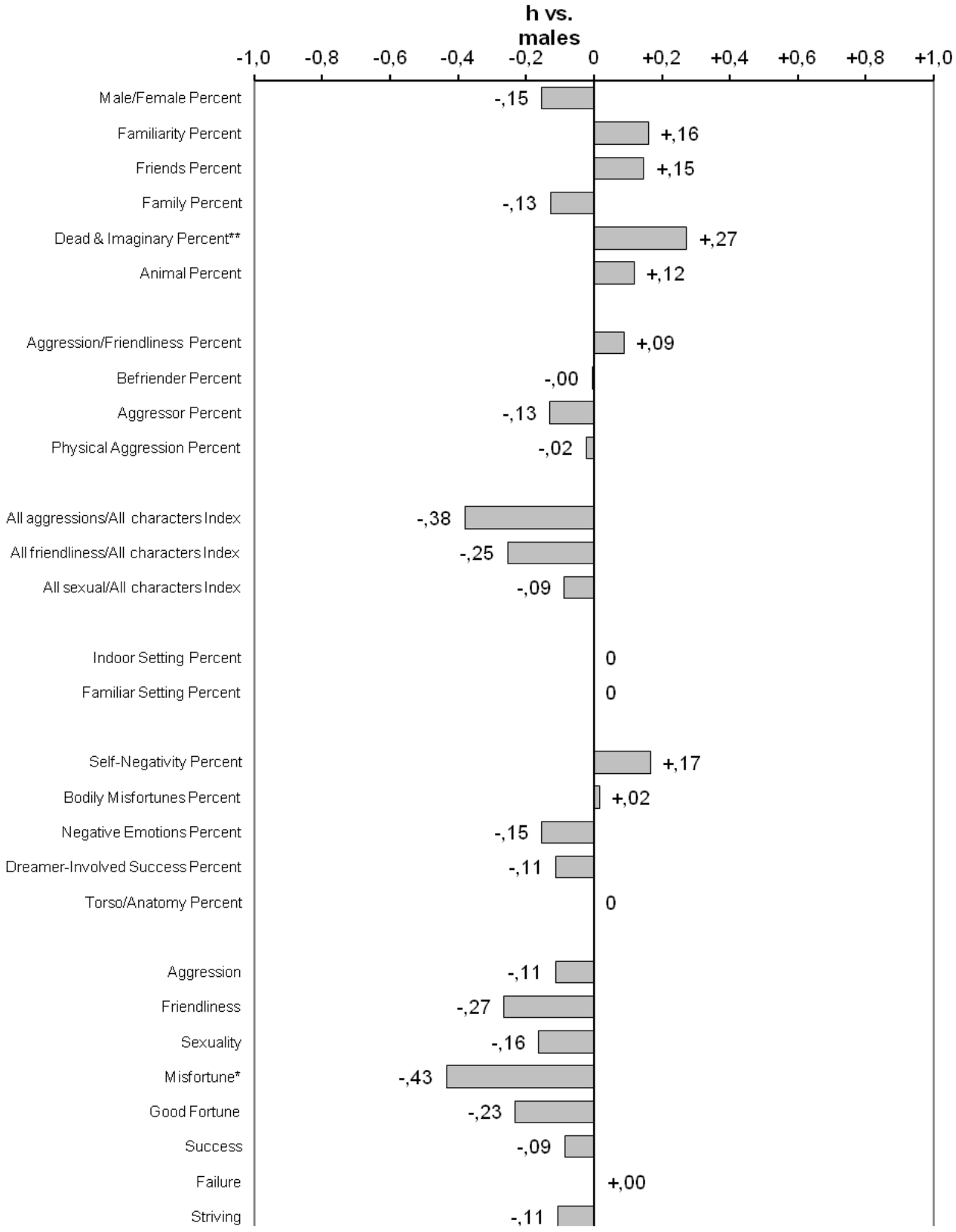
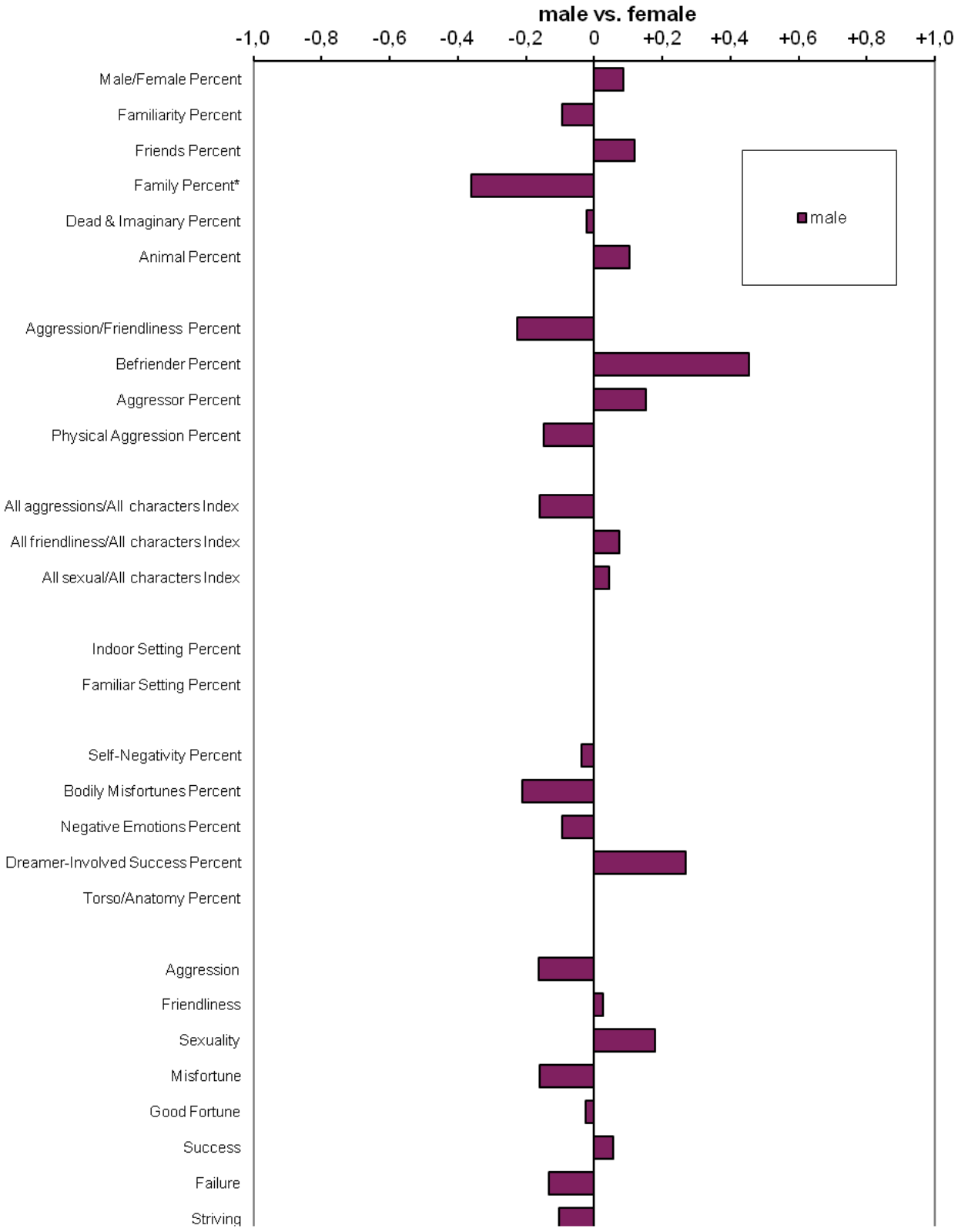
Gerrans, P. (2012). Dream experience and a revisionist account of delusions of misedentification. Consciousness and Cognition, 21, 217-227.

Hall, C.S., & Nordby, V.J. (1972). The individual and his dreams. New York: New American Library.
Hall, C.S., & Van de Castle, R.L. (1966). The content analysis of dreams. New York: Appleton-Century-Crofts.
Hobson, J.A., Hoffman, S.A., Helfand, R., & Kostner, D. (1987). Dream bizarreness and the activation-synthesis hypothesis. Human Neurobiology, 6, 157-164.
Janssens, A.C.J.W., & Kraft, P. (2012). Research conducted using data obtained through online communities: ethical implications of methodological limitations. PLoS Medicine, 9 (10), 1-4.
Kahn, D., Pace-Shott, E., & Hobson, A.J. (2002). Emotion and cognition: feeling and character identification in dreaming. Consciousness and Cognition, 11, 34-50.
Kahn, D., Stickgold, R., Pace-Schott, E. F., & Hobson, J. A. (2000). Dreaming and waking consciousness: A character recognition study. Journal of Sleep Research, 9, 317–325.
Kozmová, M., & Wolman, R.N. (2006). Self-awareness in dreaming. Dreaming, 16 (3), 196-214.
McNamara, P., McLaren, D., & Durso, K. (2007). Representation of the Self in REM and nREM dreams. Dreaming, 17 (2), 113-126.
Mitchell, R.W. (2003). Subjectivity and self-recognition in animals. In: M.R. Leary and J.P. Tangey (Eds.), Handbook of self and identity (pp. 567-593). New Yourk: Guilfford Press.
Moorcroft, W.H. (2003). Understanding sleep and dreaming. New York: Kluwer Academic/ Plenum Publishers.
Schneider, A. (2008). DreamSAT –Automated Dream Data Entry System and Statistical Analysis Tool, http://www.dreamresearch.net/DtreamSat
Snyder, F. (1970). The phenomenology of dreaming. In: L. Madow and L.H. Snow (Eds.), The psychodynamic implications of the physiological studies on dreams (pp. 124-151). Springfield, IL: Charles C. Thomas.

Appendix 1. Statistics h-value: female vs norm (* p<.01, **p<.001).



Appendix 2. Statistics h-value: male vs norm (* p<.01, **p<.001).



Appendix 3. Statistics h-value: female vs male (* p<.01, **p<.001).