

A phenomenological study of reflective awareness in dreams: Characteristics of attention, memory, and anticipation

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Summary. The objective of this study was to (1) document the diverse forms of cognition and attention that occur during dreaming and (2) articulate the qualitatively different profiles of the forms of cognition and attention that constitute classes or categories of reflective awareness during dreaming. Seventy introductory psychology students (68.1% females, 31.9% males, mean age = 19.8 years, SD age = 2.5 years) participated for partial course credit. Participants were asked to describe the dream that had most significantly influenced their thoughts and feelings after awakening during the preceding three months. Then, participants were asked to respond to a series of open-ended questions that captured the diverse forms of the cognitive and perceptual (including attentional and intentional) components of reflective awareness within the dream. Finally, participants were asked to complete a Dream Reflective Awareness Questionnaire regarding numerous aspects of reflective awareness during their dreams. The results revealed five clusters of dream reflective awareness, in terms of qualitatively different combinations of attention, memory, and anticipation during dreaming. It was also found that the relationships between two patterns of dream reflective awareness (i.e., depersonalization, dual perspectives) and certain attentional and cognitive categories in dreams were significant. Potential explanations for these phenomena were discussed.

Keywords: Dream, lucid dreaming, reflective awareness, attention, memory, anticipation

1. Introduction

Dreaming is usually single-minded (Rechtschaffen, 1978), i.e., the dreamer experiences events and circumstances within the dream as a fully constituted world. However, dreamers sometimes become aware of dreaming while dreaming, and such “lucidity” regularly entails attention, memory, and reasoning/anticipation (Gackenbach, 1991; Green & McCreery, 1994; LaBerge, 1985; LaBerge & Gackenbach, 2000; Purcell, Moffitt, & Hoffmann, 1993; Rossi, 1985). A comparative study of waking and dreaming cognition also indicated that self-reflection was evident in retrospective descriptions of waking and dreaming experiences; in addition, the differences between dreaming and waking cognition seemed more quantitative than qualitative (Kahan, LaBerge, Levitan, & Zimbardo, 1997).

Barrett's (1992) study of cognitive abilities (i.e., rational thought and memory) during lucid dreaming found that “awareness of dreaming while dreaming” (as a typical way of defining lucid dreaming) did not capture the diverse forms of cognition that she observed in such dreams. That is, based on the investigation of the asynchronous appearance of different aspects of cognition during lucid dreaming, she suggested that there were qualitatively different profiles of

mental activity, rather than different “levels” along a lucidity “dimension”; moreover, dreams that seemed lucid (in some sense) seemed to occur without explicit awareness of the dreaming state.

The asynchronous appearance of different aspects of cognitive abilities and dream lucidity has suggested the need for a more comprehensive approach to the study of reflective awareness in dreams. Perhaps explicit awareness of dreaming while dreaming is not an all-or-nothing event, but rather a special quality of dream lucidity (attentive awareness) that may be accompanied by other relevant phenomena (e.g., memory, reasoning, intentionality) that jointly appear in complex and subtle patterns.

However, some research on lucid dreams has suggested that lucidity (i.e., awareness of dreaming while dreaming) and intentionality (i.e., volitional actions or dream control) are closely related processes that need to be considered separately (Kahan, 1994; LaBerge & DeGracia, 2000; Purcell, Moffitt, & Hoffmann, 1993; Schwartz & Godwyn, 1988; Windt & Metzinger, 2007). In general, lucidity comes earlier and may be followed by intentional action or dream control. Nevertheless, lucidity is not always accompanied by intentional action or dream control; in some cases, intentionality (especially control of one's own thoughts and feelings) exists without awareness that one is dreaming (e.g., Kahan, 1994).

Therefore, the objectives of this study were focused mainly on the attentive awareness and the cognitive components of reflective awareness within dreams. More specifically, this study was intended to (1) document the diverse forms of cognition and attention that occur during dreaming and (2) articulate the qualitatively different profiles of the forms of cognition and attention that constitute classes or categories of reflective awareness during dreaming.

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2. Method

2.1. Participants

Seventy introductory psychology students from the University of Alberta (68.1% females, 31.9% males, mean age = 19.8 years, SD age = 2.5 years; excluding one case without demographic data) participated for partial course credit. To be eligible, participants had to report in a mass testing procedure that they had an especially impactful dream during the preceding year and that they had dreams that affected their waking thoughts and feelings moderately often during the preceding year.

2.2. Measures and Procedures

At the beginning of each research session, participants were informed of the nature of this study, assured of the anonymity and confidentiality of their participation, and asked for written informed consent. Then, participants were asked to complete a series of questionnaire measures on a small group basis. Toward the end of the research session, participants were given a debriefing statement regarding the study they had just completed.

Specifically, participants were asked to describe the dream that, during the preceding three months, “most significantly influenced [their] thoughts and feelings after awakening.” They were instructed to describe their dreams as exactly and as fully as they could remember them, in their own words, without any interpretation or explanation. That is, they were asked to tell the dream story, from beginning to end, as if it were happening again (and without any interpretation or explanation). Moreover, their dream reports should contain, if possible, a description of:

- All the objects, places, characters, and events in their dreams;
- The entire sequence of actions and events, from the beginning to the end of their dreams;
- The moment-to-moment thoughts and feelings, from the beginning to the end of their dreams; and
- Any unusual, incongruous, or implausible dream thoughts, feelings, objects, places, characters, or events

(Kuiken & Lee, 2006)

Participants were then asked to respond to a series of 19 open-ended questions that captured the diverse forms of the cognitive and perceptual (including attentional and intentional) components of reflective awareness within the dream (e.g., “please describe any moment *during the dream* in which you explicitly remembered events from your waking experience”; “please describe any moment during the dream in which you anticipated events *within the dream* that had not yet occurred”; “please describe any moment *during the dream* in which you experienced things *simultaneously* from two [or more] perspectives”) (see Appendix). Some questions were merely for the exploratory purpose to initiate potential future research; for instance, questions B, L, O, P and Q were enquiring about false awakening, communication with dream characters (inexplicable knowing), and metamorphosis (or transformation of psychological states, etc.) in dreams, which were relevant but not the major concerns for this study (e.g., Busink & Kuiken, 1996; Green & McCreery, 1994; Kuiken & Sikora, 1993), and thus the responses under these questions were not included

as sources for analysis. Finally, participants were asked to complete a 59-item *Dream Reflective Awareness Questionnaire (DRAQ)* (Lee, Kuiken, & Czupryn, 2007) regarding numerous aspects of reflective awareness during their dreams (e.g., *lucid mindfulness, dual perspectives, depersonalization, intra-dream self-awareness/intra-dream self-reflection, willed appearances*, etc.). These questionnaire items reflect Rossi’s (1985) and Purcell et al.’s (1993) multi-faceted descriptions of self-reflectiveness, as well as relevant dream characteristics identified in other studies (e.g., Barrett, 1992; Green & McCreery, 1994; Kahan, LaBerge, Levitan, & Zimbardo, 1997; LaBerge & DeGracia, 2000; LaBerge & Gackenbach, 2000). The questionnaire used a 5-point Likert-type scale in which 0 = “not at all true” and 4 = “extremely true.” The results regarding principal psychometric work for the DRAQ will be presented in another paper.

3. Results

The classification of categories of reflective awareness in dreams was based mainly on the descriptions of dream experiences provided in the dream reports; however, information gathered from the open-ended questions served the role of providing supplementary indications for the occurrence of certain characteristics of dream reflective awareness, which might not be described specifically in the dream report section. That is, because open-ended questions probed in a more specific way, they helped to gather deeper and more detailed information which might not otherwise be provided in the dream reports. The information in both sections was considered and analyzed. In particular cases where the content in dream reports might not be able to provide a very clear direction for coding decisions, the responses in the open-ended questions provided important, supplementary clues for coding.

Using the numerical classificatory methods suggested by Kuiken and Miall (2001), the linguistic data of participants’ responses were reviewed, compared, coded, and analyzed systematically by the author of this study, via the MaxQ-DA software. Due to time and financial constraints, there was only one formal rater (the author), who coded the texts throughout all cases in a systematic way. Therefore, as a single rater, the author reached out for feedback when the coding decisions were not very clear, although there were just several of these instances. Specifically, two research colleagues of the author provided feedback on the uncertainty of some coding results, and thus the results were refined by reducing ambiguity.

With regard to the phenomenological method, the strategies used in this study are delineated as follows: Firstly, when distinct patterns of certain dream reflective awareness phenomena were present across dream cases, tentative categories were created based on the commonality. Then, all dream cases (including dream reports and answers to relevant open-ended questions were reviewed in detail to examine if some units (including the meanings of words, phrases, sentences, or paragraphs, when applied) fit into the aforementioned categories. More specifically, when there was evidence of fitting into a certain category, a case was coded as “1” (presence) regardless of multiple pieces of evidence from that single dream case; in contrast, if there was no evidence of fitting into a certain category, that dream case was coded as “0” (absence). Finally, if a tentative category contained more than approximately 10% of the total cases, this category was included for the formal quantita-

Table 1. Distinctive Characteristics of Five Clusters based on the Classification of Categories of Reflective Awareness in Dreams

Cluster	Naming	Distinctive characteristics
Cluster 1 (n=24)	Reasoning/anticipation within dreams (ONLY)	<ul style="list-style-type: none"> • Anticipating events within the dream
Cluster 2 (n=11)	Memory within dreams (ONLY)	<ul style="list-style-type: none"> • Remembering events within the dream
Cluster 3 (n=13)	Memory beyond dreams (bizarre and general)	<ul style="list-style-type: none"> • Remembering events that occurred before the dream (remembering coincides with surreal or inexplicable dream events; remembering everyday activities) • Self-relevant realization or recognition
Cluster 4 (n=14)	Memory beyond dreams (general) + reasoning/anticipation and memory within dreams (general)	<ul style="list-style-type: none"> • Remembering events that occurred before the dream (remembering everyday activities) • Dream déjà vu • Anticipating and remembering events within the dream • Re-orienting toward or examining more closely an intriguing object or event
Cluster 5 (n=8)	Memory beyond dreams (personally significant) + reasoning/anticipation and memory within dreams (personally significant)	<ul style="list-style-type: none"> • Remembering events that occurred before the dream (remembering personally significant events related to conflict within the dream) • Anticipating and remembering personally significant events within the dream • Re-orienting toward or examining more closely a challenging object or event

tive cluster analysis (Squared Euclidian distances, Ward's method).

After cluster analysis, this study eventually identified five classes/clusters of reflective awareness in dreams. The most distinctive characteristics include remembering events within and before the dream, anticipating events within the dream, as well as some other accompanying characteristics, such as dream déjà vu (vague memory), and certain forms of re-orientation and self-understanding. Although there are some similarities in terms of the characteristics shared by Cluster 3, Cluster 4, and Cluster 5, the complicated combinations of the characteristics (with specific conceptual meanings of certain characteristics) have distinguished these clusters from each other as well. The distinctive characteristics and conceptual naming for these clusters are described in Table 1. To be concise in presenting this framework, the conceptual naming is mainly based on the focal characteristic(s) of each cluster.

In contrast to "anticipating events within the dream" (i.e., dream events), "anticipating events beyond the dream" (i.e., waking events) was relatively rare and did not appear as a distinctive quality for any of the above categories.

For Cluster 1, there is no apparent form of any memory components of reflective awareness within the dream, which appears to be the most critical difference that separates this cluster from the others. Regarding the temporal forms of memory, "remembering events within the dream," which was characteristic of Cluster 2, means that *the dreamer explicitly remembered previous events within the temporal duration of the dream*. For example:

- ...When I was running away I remembered walking on the water when I was at the pool and thinking if I could do it again...
- ...I remember[ed] what to do when I came to certain parts of the ship so that I could hid[e] from them...

On the other hand, "remembering events that occurred before the dream" means that *the dreamer explicitly remembers events from waking experiences*, and this form was characteristic of Cluster 3, 4, and 5. For example:

- ...When we went to go see uncle Mark (pseudonym) in the hospital he actually was in the hospital....and I remembered that when my dad mentioned it in the dream....
- ...I remembered my past online relationships and always had a lurking memory of becoming engaged to Jeff (pseudonym)...

A distinction between these two kinds of memory is conceptually necessary since each one is associated with qualitatively different profiles of the aspects of dream reflective awareness studied here (Cluster 2 vs. Clusters 3, 4, and 5). In addition, the results showed that recognizing something bizarre or surreal, especially for content beyond the dream scope, is a distinctive characteristic for dreams in Cluster 3, and this perhaps is critical for the accompanying self-understanding or self-realization. The results also indicated that re-orienting toward intriguing dream events, the related recall of everyday dream activities, and dream déjà vu were specific to dreams in Cluster 4, while vigilance-related re-orientation and the related recall for personally significant events was specific to the dreams in Cluster 5.

As to the exploratory analysis based on DRAQ items (the 17-item version of DRAQ was used for final analysis; this analysis was based on the differentiation of five patterns of dream reflective awareness [i.e., *lucid mindfulness, dual perspectives, depersonalization, intra-dream self-awareness/intra-dream self-reflection, and willed appearances*] suggested by Lee and Kuiken [in preparation] and by Lee [2010]), five one-way ANOVAs were conducted to examine whether different clusters of dreams were different in terms of the five patterns of dream reflective awareness identified by the DRAQ. The results indicated that different clusters of dreams showed significant differences in *depersonalization* (i.e., "a form of reflective awareness in which the dreamer's sense of self seems unreal or strange"; Lee [2010]), $F(4,65) = 3.15, p = .02$. Post hoc LSD comparisons indicated that ratings on depersonalization were higher for dreams in Cluster 1 than dreams in Cluster 2 ($p < .01$) and Cluster 3 ($p < .01$). Except for this finding, no significant effects were found for the other four ANOVAs.

As the characteristics of dreams in Cluster 4 and Cluster 5 were relatively similar to a certain degree, the contrast between Cluster 4 and Cluster 5 deserved a close look. For exploratory purposes, a series of LSD comparisons were also conducted. Specifically, the LSD comparisons also indicated there was a tendency that dreams in Cluster 4 appeared higher on the ratings of *dual perspectives* (i.e., “a form of reflective awareness involving two separate and autonomous agents”; Lee [2010]) than dreams in Cluster 3 ($p < .05$), but dreams in Cluster 5 did not show any differences in dual perspectives compared to the other clusters. However, the interpretation of this result is only for reference and should therefore be treated with caution.

4. Discussion

To summarize, this study has identified certain distinguishing characteristics of dream reflective awareness, including memory within dreams, memory beyond dreams, anticipation within dreams, as well as some other co-occurring characteristics, such as dream déjà vu, and certain forms of re-orientation and self-understanding. Based on the classification of reflective awareness in dreams, the results showed that dreams can be classified into five clusters with distinctive combinations of characteristics representing their uniqueness.

Compared with memory characteristics in dreams, the characteristic of reasoning/anticipation seems relatively obscured. Also, in contrast to “anticipation within dreams”, “anticipation beyond dreams” was relatively rare and did not appear as a special quality for any of the clusters identified in this study. Among all five clusters of dreams identified, Cluster 1 has more cases than the others, and this seems to indicate that although reflective awareness (especially for cognitive ability) in dreams was not an infrequent phenomenon, there was a large proportion of dreams that tended to involve merely a simple way of reflection. Moreover, in general, dreams in Clusters 3, 4, and 5 contained relatively complex forms of dream reflective awareness, compared with dreams in Clusters 1 and 2. Is this complexity somehow related to the dream function of self-transformation? If it is, will dreams in these different clusters take different forms of self-transformative functions? These are some questions we may ask and attempt to answer for the next step.

This research suggests that, in studies of reflective awareness during dreaming, it is critical to address (1) the different (temporal) forms of memory (i.e., memory within vs. before/beyond the dream); (2) the different forms of re-orientation/attention within the dream (i.e., re-orienting toward an intriguing vs. challenging object or event); (3) the different (component) forms of memory (i.e., memory of everyday vs. personally significant events); and (4) the different forms of reflexivity (i.e., singular perspectives vs. dual perspectives on dream events). The contrast between the combined forms of dream cognition (e.g., memory of everyday activities, or, memory of personally significant events) and attention (e.g., vigilance-related re-orientation or perceptually intriguing re-orientation) will be also important for future studies. For instance, both the 4th and 5th categories of reflective awareness involved the complex forms of cognition and attention within the dream; however, it is expected that they may have rather different effects on post-dream thoughts and feelings.

The findings of this research echo the evidence of Lee (2017) in differentiating forms of cognitive abilities within

dreams. In the present study, there is also evidence to support the structure of comparisons and contrasts between memory and reasoning/anticipation, as well as between narrow and broad scopes in which such abilities occur (i.e., within and beyond dreams). Moreover, this study has demonstrated the complexity of combinations of these cognitive abilities and other relevant characteristics of dream reflective awareness.

These results may be helpful for understanding a recent finding in lucid dreaming research. Dyck, Schredl, and Kühnel (2017) compared three different kinds of lucid dream induction methods and indicated that applying cognitive techniques (i.e., wake-up-back-to-Bed, reality testing/reflection) may be followed by a slight increase in frequency of lucid dreaming. Perhaps, these lucid dream induction methods may facilitate a kind of cognitive connection across waking and dreaming states by broadening the “cognitive scopes”, from within to beyond the dreaming state. That is, such strategies may help facilitate the cognitive functions taking place during the dreams, and, in turn, also facilitate lucid dreaming. However, these concepts are currently hypothetical and deserve further examinations. The notion of making comparisons and contrasts between memory and reasoning/anticipation, as well as between narrow and broad cognitive scopes, may provide some perspectives for addressing these issues.

According to Lee (2017) in a study conducted based on a Taiwanese sample, depersonalization in dreams was not accompanied by memory and reasoning/anticipation. The present study, based on a Canadian sample, found depersonalization in dreams also appeared independent from memory characteristics within dreams, although there seems to be an association between depersonalization and reasoning/anticipation within dreams. These associative patterns deserve further examination in future studies.

Specifically, characteristics of Cluster 1 were associated with depersonalization in dreams. This suggests that the distortion (or perhaps, transformation) of the original sense of self in the dream might be associated with difficulties in accessing the memory source, whether on waking or intra-dream memory. This finding echoes the results of Lee’s (2010) research on reflective awareness within dreams following loss and trauma, as well as its discussion on potential dream function. In her research, it was found that depersonalization was higher in the trauma groups than the loss groups and that depersonalization reached its peak occurrence within dreams between 6-24 months after loss and trauma, in comparison with the timeframes of between 0-6 months and 3-7 years following adversity. Similar to the phenomenon whereby depersonalization can be used as a coping mechanism during traumatic events (Shilony & Grossman, 1993), distancing oneself from the ongoing dream experiences, negating their subjective nature, and even going through temporary “amnesia” during dreaming might paradoxically serve some kind of adaptive function. Nevertheless, whether this possible adaptive strategy is an effective one for the individual’s long-term psychological health and capability is still unclear.

In Cluster 4, reflection on dream events took the form of déjà vu, suggesting the doubling of perspectives: the experienced dream events and the simultaneous sense that they had “occurred before.” The suggestion of doubling is reinforced by evidence that dreams in this cluster were associated with questionnaire responses suggesting *dual*

perspectives (i.e., “a form of reflective awareness involving two separate and autonomous agents”; Lee, 2010; Lee & Kuiken, 2015; Lee & Kuiken, in preparation). In contrast, reflection on personally significant dream events related to conflict or challenge in the 5th cluster occurred from a more-or-less unified and singular perspective. Based on these results, this study suggests that departures from what has been called the single-mindedness of dreams come in different forms; even remembering the events that precede the ongoing dream manifests different styles or forms of first-person perspective.

The findings of this research also echo some of the results provided by Voss, Schermelleh-Engel, Windt, Frenzel, and Hobson (2013). They compared lucid and non-lucid dreams in terms of the structure of consciousness experiences by constructing and validating the Lucidity and Consciousness in Dreams scale (LuCiD). In total, eight factors were identified, including two cognitive dimensions—(logical) thought and memory—which were considered to be important cognitive functions for the secondary consciousness (reflective awareness) of lucid dreaming. However, there were also some differences between the conceptual meanings for cognitive factors in Voss et al. (2013) and the cognitive characteristics in the present study. These differences deserve a closer examination in future research. Another interesting finding suggested in Voss et al.’s study is that the factor “dissociation” is more likely to appear in lucid dreams than in non-lucid dreams, although the frequency is relatively low. The findings of the association between “depersonalization” and Cluster 1 identified in this study not only indicated this tendency, but also further pointed at a specific kind of dream reflective awareness (i.e., reasoning/anticipation within dreams) that may be accompanied by it. Voss et al. also suggested that the onset of dream lucidity may involve a significant change in self-related processing, and the present study also provides some evidence to support the idea of self-related processing. More specifically, especially for dreams in Cluster 3 and Cluster 5, distinctive characteristics of self-understanding and self-related/personally-significant cognitive processing were present, although the dreamers might not reach the level of explicit lucidity.

The results could have been more rigorous than the current form if this study had two or three raters to do the coding in its entirety. However, regardless of this limitation, similar to a lot of qualitative research that relies on a sole researcher to interpret the data, the value of the present study may be more exploratory or indicative than confirmative. In addition, although this study has provided evidence to show several, for the most part distinctive clusters, in terms of their characteristics of dream reflective awareness and patterns associated with the DRAQ items (another substantial measure of dream reflective awareness), it is still not very clear why certain kinds of characteristics were relatively pervasive and were consistently accompanied by other characteristics. Because of the exploratory nature of this study, a lot of phenomena surrounding these issues are still unknown and await further investigation. The findings of this research may be indicative for future studies in differentiating the complex but relevant characteristics of reflective awareness within dreams.

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Appendix

Open-Ended Questions for Enquiring Cognitive and Perceptual Components of Reflective Awareness within the Dream

Read each of the following questions carefully, answering each one that applies to your dream. If a question does not apply, simply write 'N/A' for that item.

- A. Please describe any moment **during the dream** in which you experienced **déjà vu**, i.e., the distinct sense that you have “experienced this before.”
- B. Please describe any moment in which you **dreamed** of waking up (although when you **actually** woke up later you realized it was a false awakening).
- C. Please describe any moment **during the dream** in which you **became aware** that some part of the dream (an object, place, character, or event) was strange or bizarre.
- D. Please describe any moment **during the dream** in which you looked more closely at something (or listened more closely to something) and realized more fully what it was.
- E. Please describe any moment **during the dream** in which you **explicitly remembered** previous events **within the same dream**.
- F. Please describe any moment **during the dream** in which you explicitly remembered events from your **waking** experience.
- G. Please describe any moment **during the dream** in which you anticipated events **within the dream** that had not yet occurred.
- H. Please describe any moment **during the dream** in which you anticipated **waking** events that had not yet occurred.
- I. Please describe any moment **during the dream** in which you became **aware that you were dreaming**.
- J. If you were aware of dreaming, please describe any moment **during the dream** in which you found that you had **control over what you were dreaming or over dream events**.
- K. Please describe any moments **during the dream** in which you wished, wanted, or willed something to happen and (perhaps surprisingly) found that it actually happened.
- L. Please describe any moment **during the dream** in which a dream character was trying to communicate (or even silently convey) something to you.
- M. Please describe any moment **during the dream** in which you became aware of having a distinctly different perspective than another character (or other characters) in the dream.
- N. Please describe any moment **during the dream** in which you experienced things simultaneously from two (or more) perspectives.
- O. Sometimes objects, places, or characters **spontaneously change**, i.e., an object changes into another object, a place changes into another place, a character changes into another character, an object becomes an animate thing, a dead character becomes alive, etc. Please describe any such spontaneous changes that occurred **within your dream**.
- P. Sometimes, during their dreams, dreamers themselves **spontaneously change**, i.e., there is a change in physical appearance, a change in ability, a change in character, a change in sense of self, or a change in attitude or feeling. Please describe any spontaneous changes in yourself that occurred **during your dream**.
- Q. Sometimes, during their dreams, dreamers are **changed by dream events**. In other words, the dream events **bring about** a change in physical appearance, a change in ability, a change in character, a change in sense of self, or a change in attitude or feeling. Please describe changes in yourself, **during the dream**, that dream events brought about.
- R. Please describe any moment **during the dream** in which you became aware of aspects of your life that you usually ignore. (Please understand this question broadly, i.e., in relation to your physical circumstances, your worldview, your values, your sense of self, your spiritual destiny, etc.)
- S. Please describe any moment **during the dream** in which your **way** of sensing or knowing something was different than is usual for you, e.g., it was intuitive, uncanny, or distinctly different in some other way.