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Testing the implicit processing hypothesis of precognitive dream experience

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ABSTRACT

Seemingly precognitive (prophetic) dreams may be a result of one's unconscious processing of environmental cues and having an implicit inference based on these cues manifest itself in one's dreams. We present two studies exploring this implicit processing hypothesis of precognitive dream experience. Study 1 investigated the relationship between implicit learning, transliminality, and precognitive dream belief and experience. Participants completed the Serial Reaction Time task and several questionnaires. We predicted a positive relationship between the variables. With the exception of relationships between transliminality and precognitive dream belief and experience, this prediction was not supported. Study 2 tested the hypothesis that differences in the ability to notice subtle cues explicitly might account for precognitive dream beliefs and experiences. Participants completed a modified version of the flicker paradigm. We predicted a negative relationship between the ability to explicitly detect changes and precognitive dream variables. This relationship was not found. There was also no relationship between precognitive dream belief and experience and implicit change detection.

1. Introduction

Precognition, the putative reception of future-related information that could not have possibly been obtained by any known means (e.g., rational inference, coincidence), is one of the most widely believed paranormal phenomena. Surveys of large samples of individuals show that around one third of the population believe in the ability to foretell the future (Moore, 2005) or have experienced at least one precognitive dream (Haraldsson, 1985; Palmer, 1979). This paper explores potential psychological factors contributing to precognitive dream belief and experience.

Beside the hypothesis that precognitive dreams are a genuine phenomenon amenable to scientific testing (Krippner, Ullman, & Honorton, 1971; Sherwood & Roe, 2003), there have also been proposed several alternative hypotheses to explain this and similar experiences, such as individual differences in probabilistic reasoning and affirmative bias (Blagrove, French, & Jones, 2006), false memories (Wilson & French, 2006), or attribution of meaning to coincidence (Houran & Lange, 1998). One such, as of yet unexplored, hypothesis proposes that precognitive dreams might be a result of inferences during sleep based on subtle cues from the environment perceived outside of awareness. This hypothesis was first proposed by Aristotle

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over 2000 years ago in his treatise *On Prophesying by Dreams*, and was more recently voiced by Alcock (1981). To illustrate, a fulfilled nightmare about the death of an elderly relative might be caused by perceiving, without awareness, a slight change in their appearance, behaviour or physiology (e.g., heavier breathing, paler complexion) during a previous encounter. These subtle, yet disconcerting indications of ill health might create a seemingly precognitive dream about the death of the person in question. If this person then passes away, the dream is recalled and the attribution of precognition is made.

The plausibility of the implicit processing hypothesis (IPH) of precognitive dream experiences appears to be supported by research into sleep and dreaming. There exists extensive literature supporting the notion that dreams reflect, to some extent, waking life experiences (e.g., Fosse, Fosse, Hobson, & Stickgold, 2003; Hobson & Schredl, 2011; Pesant & Zadra, 2006; Schredl & Hofmann, 2003, for discussion). In light of this research, there appears to be no reason why information acquired in waking like could not, in principle, manifest itself in dream imagery.

Moreover, the prevailing expert opinion seems to agree with the claim that sleep and dreaming can facilitate processes such as memory consolidation or learning and inspire insight (Walker & Stickgold, 2006), although there are also opposing views on the matter (Frank & Benington, 2006; Vertes & Eastman, 2000). Previous research in this area has found support for the role of REM sleep in consolidation of memory and learning (Ellenbogen, Payne, & Stickgold, 2006; Stickgold & Walker, 2007; Wamsley, Tucker, Payne, Benavides, & Stickgold, 2010), including probabilistic and procedural learning (Djonlagic et al., 2009; Walker, Brakefield, Morgan, Hobson, & Stickgold, 2002). There is also some evidence that sleep causes improved performance on tasks requiring insight into hidden rules (Wagner, Gais, Haider, Verleger, & Born, 2004) and primes associative networks (Cai, Mednick, Harrison, Kanady, & Mednick, 2009).

Here we present two studies testing the IPH. Study 1 explores the relationship between implicit learning and precognitive dream experiences while Study 2 focuses on perception without awareness and its relationship to these experiences. Both studies were approved by the Psychology Department's ethics panel.

2. Study 1

One prediction of the implicit processing hypothesis is that people who tend to have these experiences are better able to pick up on subtle environmental cues and process them without being aware of it. This can be tested in the frame of the implicit learning paradigm. Implicit learning occurs when people acquire new information without intending it or being consciously aware of having done so (Cleeremans, Destrebecqz, & Boyer, 1998; Kaufman et al., 2010). Several methods for exploring implicit learning have been developed but one in particular, the Serial Reaction Time task, seems to be the most appropriate and most widely used (Jiménez & Vázquez, 2005). Moreover, this method has recently been used in individual differences research, where implicit learning significantly correlated with the personality factors of intuition, Openness to Experience, and impulsivity, as well as with cognitive variables including verbal analogical reasoning, processing speed, and academic performance (Kaufman et al., 2010). This individual differences approach regards implicit learning as an ability and is in line with our hypothesis.

Of potential interest in exploring the relationship between implicit processing and precognitive dream experience is the concept of transliminality, developed by Thalbourne and Delin (1999) and defined as "a largely involuntary susceptibility to, and awareness of, large volumes of inwardly generated psychological phenomena of an ideational and affective kind" (Thalbourne & Delin, 1999, p. 25). Crawley, French, and Yesson (2002) found a link between transliminality and susceptibility to subliminal priming. Participants in this study were led to believe they were taking part in an extra-sensory perception card-guessing task. Unbeknownst to them, half of the trials were preceded by a subliminal prime showing the correct response. The results showed that transliminality was positively related to number of correct responses only on the primed trials. Furthermore, in a subsequent task, high transliminality subjects were more successful at detecting which trials had been primed, even though they reported no conscious awareness of the priming in the card-guessing task. These findings suggest that transliminality might play a role in the kind of implicit processing required by the IPH. If high levels of transliminality are conducive to being able to detect subtle environmental cues (e.g., subliminal primes used in the above-mentioned study) without being aware of them, then people who experience precognitive dreams should, under the IPH, score high on transliminality. Similarly people who possess higher levels of this trait should show superior implicit learning ability compared to low transliminality individuals. Study 1 therefore predicts that precognitive dream experience will positively correlate with transliminality and implicit learning.

2.1. Method

2.1.1. Participants

A planned number of participants ($N = 50$, 31 females), mostly undergraduate students, were recruited and paid for their participation. Data from one participant were excluded due to incompleteness and another participant was recruited in order to preserve the planned number of participants. Participants' ages ranged from 17 to 53 years (mean = 21.98, SD = 17.49).

2.1.2. Materials and apparatus

2.1.2.1. Serial reaction time. To assess individual differences in implicit learning, we used a modified version of the widely-used Serial Reaction Time (SRT) task (Nissen & Bullemer, 1987) used by Kaufman et al. (2010). During a trial, an 'X' appeared