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Final Dissertation

"Can the brain consider dreams as past experiences?"

Supervisor: Prof. Giovanni Mento

Co-supervisor: Dr. Fiorella Del Popolo Cristaldi

Candidate: Valentina Molinari

Student ID number: 2041449

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“Cuando lleguemos a ese río, cruzaremos ese puente”

(Julio César)

Content

Introduction

In this thesis, the aim is to explore the intricate connection between emotions and dreams, two extensive yet enigmatic phenomena in human experience. The theoretical investigation begins with an examination of Lisa Feldman Barrett's theory regarding the construction of emotions within the human brain. This theory posits that emotions are not innate, but rather constructed by the brain based on sensory inputs, past experiences, and situational context. Building upon this foundation, the exploration extends to various theories concerning dreams, with particular emphasis on the conceptual framework proposed by Hobson, which relates dreams to a form of virtual reality.

The stimulus for this investigation initiates from the intrigue surrounding emotions and dreams, both of which manifest unexpectedly and escape complete understanding. The central question that emerges is: Are dreams considered by the brain as past experiences?

Further analysis is directed towards unravelling the mechanisms underlying dream formation and elucidating the functions they serve. Despite the inherent methodological challenges associated with studying dreams, it is established that they play a crucial role in the restorative process, particularly during the rapid eye movement (REM) phase of sleep. However, the precise purpose of dreaming remains elusive, although hypotheses abound, suggesting that dreams may serve to process emotional experiences or integrate daily events into memory.

Of particular interest is the notion that dreams may represent a form of rehearsal or simulation for real-life scenarios, drawing upon past experiences to anticipate future challenges. This hypothesis prompts a call for further empirical investigation to substantiate or refute its validity. So, this thesis aims to propose the theoretical framework needed to conduct follow-up studies that confirm or disprove the hypothesis.

Chapter 1: Emotions

1.1 *Theory of Constructed Emotions*

The role of emotions in human experience has interested scientists and non-specialists equally since they are powerful mind influences that can affect our thinking, actions, and interactions with others. Until recently, mood has been known to be a natural reaction whose intensity and pattern are governed by well determined physiological processes. Mood is a prolonged affective state that is not linked to an event but that can influence how a person interprets experiences. According to the conventional history of emotion, emotions are a fixed aspect of our biological constitution that evolved as a result of advantageous circumstances long ago for our survival. Because of this, they are universal, which means that, for example, everyone should feel sadness in the same way regardless of their culture or location. Nevertheless, Lisa Feldman Barrett has proposed a theory of constructed emotion that is equally, if not more, compelling than the traditional view. The theory of constructed emotion basically suggests that emotions are dynamic constructors that operate according to the intrinsic properties of brain and are influenced by a wide range of factors like sensory inputs, internal states, past experiences, language and cultural influences.

The theory of constructed emotion encompasses greatly more complicated and far-reaching processes than mere responses to outside stimuli. These processes result in the integration of the sensory inputs which arise from the external environment together with the internal physiological cues, which the brain then interprets based on prior experiences and learned associations. Considering this, emotions may be viewed as human inventions since they are produced and understood by humans. And this vision is what Barrett (2017) called the theory of constructed emotion.

Our brain simulates the outer world with concepts every instant we are living. As a matter of fact, Barrett (2017) posits that humans are experientially blind without concepts. Our brain replicates things with concepts in such an imperceptible and automatic way that hearing, sight, and other senses resemble reflexes more than actual constructions. The body is just another source of sensory input, as far as the brain is concerned. Internal bodily sensations by themselves have no external psychological significance. But such feelings might have more significance when our concepts are involved. The brain employs ideas at one point to simultaneously interpret both internal and external perceptions of the environment in a certain context. To achieve this, the brain uses prediction to simplify processing incoming information. It plans future actions and anticipates their sensory outcomes based on past experiences, generating control signals for movement and bodily functions. Incoming sensory information helps to adjust and regulate brain activity by confirming or refuting these predictions. Prediction errors, or differences between current prediction signals and incoming sensory inputs, provide the brain a chance to update its internal model and learn.

The brain builds and updates its mental representation of the environment through prediction and correction. However, the brain must adapt since predictions do not always match up to real sensory data. When a prediction is made, the brain rapidly computes the prediction error by comparing it to the actual sensory input. It then efficiently reduces the error. Errors in predictions are not a concern. Life would be extremely monotonous if there were no prediction mistakes. The brain would never learn anything new as there would be nothing novel or unexpected.

The brain can essentially correct prediction mistakes in two ways. First, the brain is malleable and can alter its initial prediction. The brain's second option is to remain inflexible and stick to the initial hypothesis, filtering sensory information to support it (Barrett, 2017).

In essence, the brain creates situated, and embodied conceptual category when it creates prediction signals (Del Popolo Cristaldi, 2024). A category is created by reassembling a collection of past experiences that have characteristics in common with the way the body and the world are now. In order to coordinate and regulate motor activities, the brain continually assembles these complex collections of prediction signals, providing an explanation for the actions' origin and a clarification of the meaning of related sensory information. Put another way, the brain creates situated categories that are suited to the objectives and functional requirements of the present by running an internal model to assess the condition of its body in the current environment based on prior experiences with similar traits.

1.2 The Neurobiological Basis of Emotion Construction

Contradicting traditional conceptions which argue that emotions are the result of various events in the brain, the theory of constructed emotion states that the experience of emotions is a result of the dynamic interaction of multiple brain regions involved in sensory processing, memory, attention, and decision-making. Together, these brain areas make sure that emotions are produced and controlled.

Rather, theory and research increasingly point to the brain as an active generator of inference that operates within the framework of a Bayesian approach to probability, through which sensory inputs constrain estimates of prior probability (derived from prior experience) to produce posterior probabilities, which in turn generate beliefs about the causes of such inputs in the present. The concept of active inference postulates that the brain is constantly predicting and updating its models of the world to minimize prediction errors. These provide a predictive model explaining how external stimuli result in emotions, instead of neurons only being inactive until information is received through the body's external sensors (taste receptors, hearing, and eyes, among others), the brain predicts what sensory inputs it will get and uses those predictions to trigger actions across the cortex. The firing of neurons inside cortical columns is modulated by predictions as they spread across cortical areas in expectation of these regions receiving real sensory information from the environment (Barrett and Simmons, 2015).

1.3 Cultural and Linguistic Influences on Emotion Construction

The theory of constructed emotion also emphasizes the role that language and culture play in emotional assessment since they are a part of the context. Barrett argues that emotions are the result of not only the internal physical states and the external stimuli but also the way they use the words and cultural symbols to communicate and interpret their feelings. Cultural styles of communicating, the value system and linguistic practices may be utilized by the cultures concerned as a way through which emotions are perceived, labelled, and expressed, thus leading to variations in experience of emotions in different cultural.

In the book “How Emotions are Made”, Barrett (2017) discusses an example involving Bajta Mesquita, that illustrates how emotion perception and recognition are modulated by language and culture. Barrett recounts a moment when Mesquita introduced her to the Dutch word “gezellig”, which describes a specific type of cozy feeling that doesn't have a direct English translation. This example shows how language provides the categories and concepts that shape our emotional experiences. Cultures with different emotional vocabularies foster diverse emotional experiences and expressions, as the words available in a specific language guide how people interpret their sensations and contextual cues. Culture norms and practices shape how emotions are expressed and understood, teaching individuals what emotions are appropriate in different contexts and how to respond to the emotions of others. Thus, as previously said, emotions are not universal biological reactions but are constructed through the interplay of predictions, bodily sensations, language and cultural context. This dynamic construction process means that emotion perception and recognition are deeply embedded in cultural and linguistic practices, leading to a rich diversity of emotional experiences.

As a result, an emotional instance is a mental event in which the brain has chosen a pattern of characteristics that validates (or corrects) incoming sensory inputs, directing behavior and providing those signals with psychological significance. The motor and sensory details of a situation-specific representation are created by breaking down prior experiences, which start out as multimodal, compressed, embodied representations of "the body in the world" (Barrett and Simmons, 2015, p.7).

1.4 Interconnection of Perception, Cognition and Emotion

So, the theory of constructed emotion provides a profound knowledge basis for the complicated understanding of human emotions and the behavioral and subjective experience implications. The theory has the potential to significantly advance knowledge and discovery in psychology, neuroscience, and affective science by surpassing traditional views, that proposed the idea that emotions are innate and automatic reactions to specific stimuli, and addressing the dynamic, contextdependent nature of emotions. Hence, the paradigm shift emphasizes that the brain's role is predicting and constructing emotional experiences rather than merely reacting to external triggers. Only with continued discoveries and interdisciplinary associations, we will be able to deeper understand the basis of human emotions and the important role they play in our lives. Because of this, the thesis combines two essential elements of our everyday existence -dreams and emotions- to gain a better understanding of where they come from and how they unintentionally impact us. The main hypothesis is that just as the brain continuously generates predictions to interpret sensory input and constructs experiences like emotions, dreams serve as a way for the brain to update and refine its predictive model. Essentially, dreams function as a form of memory that the brain can later use to improve its efficiency during wakefulness.

Chapter 2: Dreams

2.1. Theories of dreams

Dreams and their significance have always fascinated and eluded humanity. Dream research is challenging partly because it depends on people recalling their experiences from a different state of consciousness after they wake up. As a result, every exciting development in our understanding of dreams is usually preceded by either a new and creative study design, or an advancement in technology.

The scientific investigation into the causes and purposes of dreaming has already produced significant findings. For example, prior research has shown that dreaming happens during both REM and non-REM (NREM) sleep, and that memories of past make up the vast majority of dream material, more than 80%. Moreover, dreams usually combine recollections of the past into new simulations rather than repeating past experiences exactly (Llinas, Pare, 1991).

The constant presence of memory content in dreams and the connection between learning and dreams have led many modern theorists to propose that dreams may have a role in the consolidation and integration of memories into long-term storage as well as the facilitation of new associations and connections. Some scientists still maintain that dreams are simply the result of brain activity related to other processes. Dreams may help shape our personal memories, which in turn influence our identity and how we view the world and ourselves. Furthermore, incorporating historical events into different new situations can serve as training for when we encounter these kinds of problems in the future (Hobson, 2014).

Our most vivid dreams are an incredible approximate simulation of reality, combining an extensive number of objects, actions, and senses to produce a highly intricate hallucination. The brain accomplishes this through the hippocampus that has long been assumed to have a part in dreaming due to its close connection to memory. According to some estimates, at least one component of every dream is attributed to a particular experience the dreamer experienced while they were awake—roughly 50% of all dreams. These dreams are never an accurate reproduction of only one memory; instead, they are composites of fragments of several present events and other memories (Wamsley, 2020). Considering all of this, one may assume that the brain areas in charge of memory are the ones that make dreams. But research from the 1960s suggests that people with hippocampal injury may nevertheless dream (Torda, 1969a; Torda, 1969b; Solms, 2014, as cited on Wamsley, 2020). What's even more surprising is that these patients can dream about recent events for which they have no conscious recall. This indicates that dreaming is a far more complicated phenomena involving many different portions of the brain, rather than simply the memory-related brain regions.

2.2 *Transition from Wakefulness to Sleep*

Dreams are self-generated experiences that take place without reference to external stimuli at the time. The shift from awake to sleep is a significant change in how we see our environment. While our experiences are heavily shaped by our surroundings when we are awake, as we go to sleep, we gradually lose the ability to notice and respond to outside stimuli. One characteristic of sleep that unites all animals is the dissociation of senses and motor functions.

Dreams have a perceptive nature, which is possibly one of their strongest features. Dreams involve precise representations of objects, people, locations, noises, and voices rather than being only wakeful thoughts or blurry perceptions. Though the "perception" itself is genuine and is perceived as being almost identical to waking awareness, these experiences are, strictly speaking, hallucinations—perceptions of something that is not present. Once more, evidence seems to go toward the theory that the same neurons, but with another type of activity, regulate dreams and waking experiences. Studies using content analysis have confirmed this similarity, demonstrating that the frequency of perceptual experiences in dreams closely resembles that of waking life, with visual experiences accounting for nearly 100% of dreams and auditory, somatosensory, gustatory, and tactile experiences following (Snyder, 1970). According to these findings, visual regions are functionally and hemodynamically active during REM sleep—the period of sleep during which the most vivid dreams take place—just as they are during consciousness.

Another important feature of dreams is that the majority of motor output is repressed. Brainstem neurons that synapse on inhibitory interneurons in the anterior spinal cord are responsible for this suppression during REM sleep (Ehrminger et al., 2016; Valencia Garcia et al., 2017). Nonetheless, there are rare circumstances when motor activities that occur while you sleep might provide information about the dream state. These conditions are, for example, during lucid dreaming, in which the dreamer is aware that they are dreaming.

2.3 Distinctions between dreams and wakefulness

In addition to sharing similarities with waking consciousness, dreams show notable distinctions. Except for the occasional occurrence of lucid dreaming, persons who are dreaming rarely experience the awareness that they are in a state of sleep while lying in a bed. Instead, they get fully engaged in the narrative of their dreams, mistaking it for reality. This erroneous view is particularly surprising when one takes into account the various inconsistencies, uncertainties, and temporal discontinuities that are characteristic of many dreams. Undoubtedly, dreams can sometimes involve physically impossible or very improbable occurrences, however these occurrences often only occur rarely and briefly, resulting in confusion or a realization that one is dreaming.

Dreams are often characterized by intense emotions and generally have a negative tone, which is in line with heightened activity in the limbic and paralimbic regions of the brain. Ultimately, the recollection of the dream and the perception experienced during the dream undergo significant modifications. Unless instantly documented, the majority of dreams are quickly forgotten, and only a tiny yet significant portion of dream experiences are stored in long-term memory (Walker, 2009)

2.4 Influence of waking life on dreams

Even while there is a strong correlation between our waking and dreaming lives—we frequently see familiar people and locations in dreams, and our worries typically mirror those in waking life—dreams are rarely an exact replication of events that occur in waking life. Rather, in dreams, aspects of the real world are altered and manifest in peculiar ways. Research analysing what aspects of waking life are reflected in dreams has revealed that many dreams are related to things that happened the day before the dream, a phenomenon known as the "day-residue effect" (Scarpelli, 2019, p.6).

To sum up, dreams are self-generated experiences that happen while a person is mostly cut off from their surroundings, both sensory and motor, and are not influenced by current external sensory inputs. Dreams are linked to the activation of perceptual regions related to particular dream contents and frequently have a vivid perceptual character, equivalent to waking experiences. Certain situations, as lucid dreaming, might cause motor reactions to dream perceptions that seem consistent with these perceptual experiences. Reduced reflective consciousness, bizarreness, strong emotionality, and partial memory deficits are characteristics that set dreams apart from waking cognition.

As previously mention, waking and sleeping contain clear distinctions as well as significant similarities. The most notable resembles between the two states are their distinct feelings and vivid, precise sensations.
Although these resemblances are frequently seen as imitations of waking through sleep, they could alternatively be signs of awakening through sleeping. Instead of drawing a boundary between the two, the goal is to investigate the notion that both awake and sleeping are simultaneously leaders and followers. Indeed, one may contend that "all experiences are dreams in a sense; dreams are not just experiences" (Revonsuo, 2006, p. 55). Dreaming informs waking, and waking confirms or contradicts those expectations.

2.5 Brain as an organ of Prediction

Dream and waking consciousness are essential to each other and complement one another. This continuous reliance comes from the idea that the brain functions as an organ of prediction, optimizing predictive models while we sleep and creating virtual worlds to explain our senses when we are awake. It's also said that dreaming is an essential step before waking awareness. In summary, predictions of sensory stimuli made during wakefulness are linked to both conscious and unconscious perception. These predictions are produced by an internal model of the world that the brain encodes. Investigators hypothesize that this model has been modified to generalize new scenarios when awake, making predictions and models of sensory input more effective when it is sleeping.

As stated, Barrett's theory posits that emotions are constructed experiences shaped by the brain's predictions, which are influenced by past experiences. Similarly, during dreaming, the brain remains active, creating simulations and predictions without external sensory input. These dreams can be seen as the brain's attempt to make sense of and predict internal signals and past experiences in a state of reduced sensory information. Therefore, dreams reflect the brain's ongoing predictive processes, constructing experiences and scenarios much like it does with emotions in waking life, but in a more freeform and unconstrained manner.

The same brain mechanisms that are active during awake constitute the foundation for this sleep optimization. This offers a remarkable and useful explanation for dreams. The idea that dreams are internally generated and are just replays of memories has been proposed, but this theory fails to provide an explanation for a large portion of dream imagery, which is either illogical or contradicts waking sources.

Hobson (2014) suggested that dreaming is like a virtual experience. Although emotions overlap between dreaming and being awake, dreams involve a deeper but narrower range of emotions, as if they are testing ground. Movements in dreams happen only in our imagination, not in real life, making sleep seem like a practice session for waking activities. According to Hobson's virtual reality dream hypothesis, humans have access to an almost limitless number of dream narratives which predict outcomes. In dreams, these scripts or scenarios are practiced and serve as a useful set of explanations for the sensory system when one is awake. But the question that arise is why the phenomenology of dreams is so distorted, hallucinogenic, and deluded (Hobson, 2014).

2.6 Predictive Models and Consciousness

As turning point in the history of consciousness research was reached in 1953 with the discovery by Aserinsky and Kleitman of brain activation during sleep (Hobson, 2014). This brain activation, along with the subjective experience of dreaming, was qualitatively similar to that of waking, suggesting an intimate relationship between brain function during sleep and wakefulness.

The concept of dreaming as a model or simulation of the world that transcends waking and dreaming awareness has been examined and improved by Thomas Metzinger and Jennifer Windt. According to Metzinger (2003), the world we live in is really an online dreaming. This blend of philosophy and comparative neuroscience gave rise to the virtual reality hypothesis (Hobson, 2014), which postulated that sensorimotor integration was inherent and formed in the womb. This idea highlights the self as an active agent in a virtual world, adapting to the fact that dream consciousness occurs hours before waking consciousness in adults and months before birth. Most people see prediction as evidence-based reasoning, which can be explained through

Bayesian inference. This process combines previous beliefs with new sensory data to form updated beliefs. These updated beliefs, which optimize the Bayesian model's accuracy, can always be described mathematically and functionally, even if not consciously. This connects to Barrett's theory on how the brain predicts the sensory information we constantly receive.

Chapter 3: Dreams and Emotions

3.1 Virtual Reality

The term "virtual reality" is frequently employed to describe an individual's personal experiences when immersed in an apparently realistic environment, like for example, when we dream. At first look, the subjective nature of the virtual reality model might not be highlighted by the predictive models that support the Bayesian brain concept, such as the one proposed by Lisa Barrett. However, because predictive models produce predictions of sensory inputs with a world experienced through senses, they are technically identical to the virtual reality that take place during dreaming. But there's a key difference between these models and virtual reality: a predictive world exists to take data into account (Hobson, 2014). This indicates that the predictive model, represented by the brain, is trying to recreate reality through sensory interactions with the outside world when it is exposed to sensory input. It is consequently limited by reality (Barrett, 2017). The brain is only able to create imaginary predictions or a virtual world when it is not constrained by senses, which happens during sleep (Hobson, 2014). So, it can be said, that although we may have a virtual reality model from birth, sensory interactions with the outside world quickly transform it into a predictive model that repeats itself every night as we sleep, anticipating sensations and working as a training field for wakefulness. Because the sensory predictions of the predictive model are specific to the self-as-an agent in an observed environment, it should be noted that it is by definition subjective (Hobson, 2014).

Predictive coding is the brain's way of continuously updating its understanding of the environment by refining its predictions about the hidden causes of the sensory inputs it receives. This process involves constantly revising hypotheses about what is happening in the environment to better match incoming sensory information (Hobson, 2014). This helps the brain efficiently process information and respond appropriately to the surroundings. As proposed by Barrett (2017), the difference between sensory input and the predictions of that input is what is referred to as prediction error.

Thus, during dreaming, mental processes are released from the task of interpreting sensory data and are directed towards creating imaginary projections that do not match any real sensory input, resulting in predicting error. Activity-dependent plasticity is then driven by these prediction errors to decrease complexity, so to refine the brain's neural connections and functions (by minimizing prediction error). Here is where it could be thought the first attempt at a working theory to explain the formal phenomenology of dreams, providing a basis for understanding why and how we dream (Hobson, 2014). To sum up, the content of dreams is an investigation into what may (or might not) occur in order to reduce model complexity and provide a more accurate representation of the world as experienced while awake.

3.2 Dreams and emotions connection

The brain creates several simulations to answer the question, "What is this new sensory input most similar to?" by using past experiences. It compares the new input to available sensory data, energy costs, and potential benefits for the body (Barrett, 2017). A simulation is a pattern that helps categorize sensory inputs to guide behavior and maintain balance. Each simulation includes an action plan. The brain fills in missing information based on previous knowledge and experiences, then uses Bayesian reasoning to choose and execute a simulation. These simulations are full-brain representations predicting the best actions to take in response to sensory inputs and future sensory events, both inside the body (like physiological changes) and outside the body (like environmental changes) (Barrett, 2017).

Now, consider how dreams function in this process. Dreams can be seen as memories the brain uses to predict and prepare for future experiences. To understand how this works, think back to a happy dream you had and compare it to a happy moment in real life. The brain uses principles of Bayes' Theorem to construct a range of simulations based on these experiences. These simulations, or possible actions and perceptions, are categorized and understood according to the concept of happiness. The brain groups and makes sense of these scenarios by relating them to its overall idea of happiness. Each simulation has a "prior"—an initial probability assigned to a hypothesis before considering current evidence. In this case, the priors reflect how similar each simulation is to the current situation before new evidence is considered. This resemblance might be goal-based rather than purely perceptual (Barrett, 2017). This means that the brain might favor simulations that align with the desired goal, such as achieving happiness, even if they are not exactly like past experiences.

To maintain balance, the brain creates a dynamic idea of happiness that adapts to specific situations rather than being absolute. This suggests that while "happiness" has a core definition, its expression varies depending on the context. By understanding dreams as the brain's use of memories to simulate and predict experiences, we see that these mental exercises contribute to our ability to navigate and interpret the world.

Dreams help the brain refine its predictions and simulations, ultimately shaping our perceptions, emotions, and actions in waking life.

3.3 Internal Models and Energetic Efficiency

Because it's energy-efficient, the brain uses ideas to build an internal model of the environment. This modelling starts even before birth, as the brain processes prediction errors from both the environment and the body.

Think of the brain as a sort of internal model that handles basic pattern generators to keep things balanced. This model relies on past experiences applied as concepts. A concept, in this sense, is a set of whole-brain representations that predict events in the sensory environment, suggest responses, and explain their impact on balance (which we feel as emotions). When unexpected information, or prediction error, is expected to disrupt balance, it's encoded and integrated. Once the prediction error decreases, the predicted outcome becomes a perception or experience, providing an explanation and guiding action (Barrett, 2017).

By using past experiences, the brain creates categories that best fit the situation and guide behavior. To detect sensory inputs, explain their source, and plan responses, the brain continuously builds ideas and organizes information. Emotions emerge once the internal model categorizes the situation.

During sleep, the brain refines its predictive model by generating simulated experiences or dreams, essentially creating a virtual testing ground. These simulations help manage prediction errors and prepare for waking life by practicing responses to potential sensory inputs. Dreams, like emotions, draw from past experiences and concepts. Dreaming, as Hobson (2014) suggests, is a virtual process that allows the brain to rehearse and improve its predictions and responses, making sleep crucial for refining its predictive model and maintaining balance. This clarifies why dreams can feel intense and emotionally charged yet often differ from waking experiences—they're internally generated scenarios helping the brain practice and perfect its predictions for real-life situations.

Conclusion

Based on the investigations, theories, and the evident connection between dreams and emotions that everyone has experienced at least once in their life, it can be posited that dreams are considered by the brain as memories. This perspective suggests that our brains utilize dreams as a mean of processing and integrating experiences, emotions, and knowledge. Dreams, therefore, may serve as a mental space where the brain can simulate and rework our waking experiences.

The idea that dreams function as a form of memory and a tool for minimizing prediction errors during waking life presents a fascinating perspective on the role of dreaming. Although the inherent bizarreness of dreams prevents them from being exact representations of everyday experiences during sleep, this characteristic could indicate that dreams provide a safe environment for testing and adjusting predictive models without the risk of real-world consequences. This safe testing ground allows the brain to explore various scenarios, emotions, and reactions free from the constraints and dangers of reality. By doing so, the brain can refine its understanding and expectations, enhancing our ability to navigate the waking world.

The unpredictability of dreams might be one of the reasons our brain is so effective at generating constant predictions. Dreams can be considered as training for the real world, not in terms of specific content and experiences, but in terms of reactivity and complexity. This training involves running through a countless of possible scenarios, some highly unlikely or fantastical, enabling the brain to improve its ability to respond to wide range of situations and preparing us to handle unexpected events and challenges with greater agility and insight.

Furthermore, the emotional intensity often found in dreams likely plays a crucial role in this training process. Emotions experienced during dreams, help the brain practice regulating and understanding these feelings in a controlled environment. This emotional rehearsal might contribute to emotional resilience and improved emotional responses in waking life. Additionally, dreams might assist in processing unresolved emotions and experiences, providing a form of “therapy” that benefits emotional and psychological balance.

In conclusion, dreams can be seen as a crucial component of the brain's toolkit for optimizing its predictive models. They offer a unique blend of memory consolidation, emotional processing, and scenario testing that enhances our ability to function effectively in the waking world. By embracing the unpredictable and often bizarre nature of dreams, our brains can explore a vast array of possibilities, ultimately improving our adaptive capabilities and emotional health. This understanding underscores the importance of dreams in the broader context of human cognition and emotional well-being.

Several questions remain unsolved to this day since the research produced inconsistent results. Discerning outcomes might have been caused by a number of variables that should be taken into account. First, a variety of experimental paradigms, from sleep restriction to complete sleep deprivation regimens, have been used to investigate the link between emotions and sleep. Large disparities in the length of sleep, the timing of sleep, and the scheduling of testing sessions emerge from these methodological variations, which frequently make it impossible to compare data in a meaningful way.

Moreover, individual variations may play a significant role in regulating the connection between emotions and sleep. Until now, studies in this area have mostly used young adult (primarily student) samples. The association between sleep and emotions is not well understood by researchers yet, as emotional functioning and sleep habits change over the course of a person's life.

Considering all these factors, I would like to suggest an experiment to validate the theory. The experiment aims to determine if dreams represent past experiences and if the brain uses these dreams to predict a person’s behavior during wakefulness. The methodology involves recruiting diverse volunteers without severe sleep problems. Participants will keep a detailed dream diary and record their daytime behavior over several weeks. The dream diaries will be analysed to identify recurring patterns and themes, which will be classified into categories related to past experiences and future events. These dream themes will then be compared with observed daytime behavior to identify correlations. Factors like emotional state and sleep environment will be controlled to ensure accurate results. The experiment will be replicated with a larger participant group, and statistical analysis will be conducted to assess the significance of correlations between dream themes and daytime behavior. A significant correlation would support the theory that dreams help the brain predict behavior during wakefulness, while a lack of significant correlation might refute the theory or suggest a more complex relationship.

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