Dream Marketing:
a method for marketing communication during sleep and dreams

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This work details a novel method for delivering marketing communications – i.e., advertisement and persuasive content - during dreams. The method allows marketing researchers and practitioners to penetrate the sleeping brain and access the dreamer's thoughts with the goal of impacting subsequent awake behavior. This paper details the application and limitations of dream content induction. Additionally, the paper highlights specific implementation parameters (e.g., optimal stimulation locations and frequencies) necessary for successful inception of content. Finally, the work discusses the ethical challenges and risks of a future where people can be influenced while they are in an altered state of consciousness and their mental guards are down.

Keywords: Dreams, Neuroscience, Marketing, Method

1. INTRODUCTION

Recent advances in neuroscience have demonstrated the ability to use sleep to engage and improve memory (Rudoy, 2009), enhance problem solving (Sanders, 2019), change behavior (Arzi, 2014), improve health outcomes (Spoormaker, 2003), or alter implicit biases (Hu, 2015). Further, research has shown promising results with respect to reading dream content (Horikawa, 2013), altering dream valence (Schredl, 2009) and manipulating dream content (Horowitz, 2020). These advances in neuroscience provide an opportunity for using dreams as a canvas for marketing content. Specifically, the possibility of delivering marketing messages (i.e., promotional material), communicating values and propositional offerings, or cueing specific concepts during the rich dream visual are becoming viable options that could revolutionize the world of marketing.

This work discusses (i) the recent advances in neuroscience that enable dream marketing, (ii) the technical details of how this can be implemented by marketing practitioners, (iii) the value and limitations of the novel methods, and (iv) the profound ethical challenges of dream marketing.

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1.1. Recent advances in accessing and manipulating dream content

Dreams have fascinated humans for millennia. Historical records of human engagement with dreams go back as far as historical records exist. Cave hieroglyphs from 5,000 years ago show dream visuals and suggest these were seen as mythical manifestations of one's psyche (Shulman, 1999). Poetry, fictional literature, biblical stories, or films have all depicted dreams as a tool for accessing one's deeper thoughts and hidden layers of consciousness. Historical records attribute some key events such as wars, technological ideation, and changes of mind to dreams (Rosselli, 2000). Yet, our understanding of the function and meaning of dreams remain limited.

Dream function theories range from ones suggesting an incorporation of existing scenarios that a person confronts in their awake life (where the dream acts as rehearsed simulation of future outcomes; Stickgold, 2000) to ones that suggest that the contents are actually meaningless and merely manifest the brains spontaneous activity (generated by the visual cortex to ensure that it remains active and prevent functional takeover due to plasticity; Eagleman, 2021). Regardless of the uncertainty about dream meaning, humans keep attributing substance to the dreams in their awake life. Telling a spouse about a dream that incorporated a romantic experience with an ex-boyfriend may yield a negative reaction in the real world even though the dreamer could argue that they had no control over the narrative. Simply, we believe that dreams mean something and treat them as such.

A momentous leap in the usage of dreams as a tool for introspection was driven by psychoanalyst Sigmund Freud, who pioneered methods of therapy that involved prompting dream narratives to access one's sub-conscious (Freud, 1900). Variations of Freud's dream theories were suggested by figures such as Jung (Jung, 1936), Hobson (Hobson, 1977), Solms (Solms, 2000), and Crick (Crick, 1983).

While these notable scholars offered thought-provoking theories about dreams, their methodologies for studying dreams were limited. For the majority of 20th century dream research relied primarily on subjective reporting (Schredl, 2010). While such

reporting is valuable in that it is conjured by the same mind that generated the dream narrative, it is also flawed in that it is often colored by the symbolic language of the awake world (Nir, 2010). For example, research has suggested that people's dream diaries were often aligned with their intuition about films (because dreams were seen as a "movie within one's mind"). In the 1910s, when films were in black and white, people reported black and white dreams. Once films transitioned to colors towards the 1950s people shifted to considering their dreams in color (Murzyn, 2008). Similarly, studies of children's dream narratives (only including items the child can name; Foulkes, 1999), of congenitally blind individuals (only including sounds and auditory cues; da Silva, 2003), of people with neural disorders (prosopagnosia patients report seeing no faces in their dreams; Solms, 2000), and of numerous other groups of people with limited awake imagery vocabulary have shown challenges in dream reporting (Solms, 2000). Accordingly, the traditional science of dreams was limited in its ability to gain true access to the dream content until recently.

Recent advances in neuroscience have offered a new lens on dreams. For the first time, scientists are able to observe dreams in real-time and decode some of their contents without the need to have the dreamer weigh-in on the experience (Horikawa, 2013). The parsing of dreams can occur while the dreamer is asleep. Further, access to the dreamer's brainwaves can clue researchers on the dream functional experience (e.g., Does it draw from memory? Is it activating the dreamer's emotions?). Recent works in neuroscience have also demonstrated the ability to decode dream content using neural acquisition tools that are more likely to be available to marketing practitioners (i.e., electroencephalogram, EEG; Siclari, 2017).

In addition to decoding dream narratives, researchers have shown that it is possible to (i) manipulate dream content (Stuck, 2008) in particular time windows (Voss, 2014), (ii) activate specific dream states (in animals; Van Dort, 2015), and (iii) communicate with the dreamer in real-time (Konkoly, 2021).

Accordingly, dream research receives growing attention and shows increased progress in neuroscience and psychology (Nir, 2010). Nonetheless, little work has been devoted to the implementation of dream research in marketing.

1.2. Dreams in marketing research

While some research relevant to marketing has looked at dreams as triggers of ideation (Wagner, 2004), creativity (Barrett, 2001), and platform for potential targeting (Cerf, 2019) no work has looked at the ability to use dreams as a canvas for marketing communication.

That said, marketing practitioners *have* already identified the potential of dreams in communication. For example, executives in the entertainment industry have recently discussed the possibility of using advances in sleep neuroscience for promotion and content delivery (Norton, 2021). Recently, Molson Coors (NYSE: TAP) has initiated an advertising campaign proposing the usage of "targeted dream incubation to alter the dreams of 100 million Super Bowl viewers" (Pegoraro, 2021). The marketing campaign's concept calls for elicitation of dreams related to Coors' beer product and is expected to increase viewers desire to purchase the beer in the real world. The technique proposed by the advertising campaign suggests that participants will be offered to play hours-long audio content while sleeping. The audio content will include cues that are expected to evoke the thought of the beer during the dreams. While there is only limited evidence from neuroscience supporting the idea that continuous auditory cues can infiltrate the dream narrative (Carr, 2020), the big-budget campaign suggests that the era of dream-content manipulation may have begun.

Although dream marketing is still far from becoming mainstream, the mere idea has raised concerns among neuroscientists when it comes to the "marketing plans aimed at generating profits at the cost of interfering with our natural nocturnal memory processing." (Stickgold, 2021).

The ability to alter people's behavior through dream marketing indeed introduces profound ethical challenges, yet the growing interest in dreams from the business world could also afford benefits for dream research. For example, leveraging large companies' marketing budgets towards funding of dream research on behavioral improvement may prove invaluable. Additionally, identifying the opportunities and limitations of dream marketing by exposing it to public discourse is critical.

As of now, we do not know if high quality dream content creation is possible, what are the limitations of such content inductions, and how dream manipulation might affect individuals long-term. While some of these consequences might be negative, it is equally plausible that enormous benefits would emerge from the work (i.e., better control of PTSD and nightmares, or reduction of adverse behaviors that can be suppressed during sleep). Some dream manipulation researchers, for example, have already shown that merely being able to induce a lucid dream in a controlled way can provide notable benefits to the dreamer (Schädlich, 2018). Similarly, studies on dreams have expanded our understanding of various states of consciousness (i.e., the change in

connectivity facilitating creativity) that have yielded remarkable benefits to society.

Studying dreams in a safe and controlled context may also show that the claims about dream manipulation are too ambitious. Indeed, works about subliminal messages decades ago suggested similar promising possibilities of manipulating behaviors (Theus, 1994), but ended up being debunked (Rogers, 1994).

With the rise in acceptance of measurement tools and devices penetrating our bedroom while we are asleep (i.e., smart-watches, sleep monitoring devices that reside on our beds and pillows, or devices that can prompt auditory/olfactory cues on demand), the possibility of dream narrative manipulation becomes viable. This work describes the technical aspects of what is already known about the dream induction methods, and how they can be practically implemented by marketing practitioners. Following, a discussion of the ethical considerations and the limitations will situate the research in the contemporary context.

2. METHODS

To facilitate injection of dream content several conditions need to be met. First, the sleeper needs to be in a dream state. Second, stimulation needs to occur during the dream state in a way that penetrates the sleeping brain but does not wake the dreamer. Third, the stimulus needs to activate a specific circuit that engages a distinct function. Fourth, residue of the injected content should impact future behaviors. This work will detail each of those steps.

2.1. Identifying a dream state

While dreams can occur at any stage of the night, they are more likely to occur during a stage known as Rapid Eye Movement (REM; Crick, 1983). REM dreams are typically more vivid and narrative-based compared to non-REM dreams (Nir, 2010). Additionally, whereas non-REM includes numerous sleep stages with varying characteristics, REM stage is easy to detect based on its recognizable neural and behavioral manifestation (Iber, 2007). Specifically, REM sleep stage is characterized by distinct EEG patterns that resemble the neural activity of an awake person (3-10Hz theta rhythm in the medial temporal regions and 40–60Hz gamma waves in the cortex) combined with movement of the eyelids that can be detected using electrodes places next to the eyes (electrooculography; EOG; Horne, 2013). As REM sleep follows a period where the brain oscillations are notably different (namely, slow oscillations that span the entire brain), the shift to REM is easily detectable using the naked eye when looking at EEG data. Given that EEG toolkits come in different setups with different frequency resolutions and electrode coverages ("montages") it is noteworthy that detection of REM can be done with relatively cheap and simple acquisition devices. As little as a single electrode placed on the frontal regions suffices for REM detection (**figure 1**). Combining the eyelid movement detection with the neural measures can yield REM detection accuracy of nearly 100%, when evaluated by a sleep technician (Wilkinson 2013). Computer codes can detect REM sleep at an accuracy approaching 83% (Imtiaz, 2014). Training the classification algorithm on data from a specific individual over the course of a few nights renders the detection of REM sleep for that person to nearly 100% (Martin, 2020). Using tools outside of EEG (i.e., smart watches, smart pillows, movement detectors using light, etc.) shows lower detection rates, but is still within a confidence interval that is regarded acceptable for commercial applications (Haghayegh, 2019; Herscovici, 2006; Yoon, 2017). It is likely that advances in electrodes engineering and in software will yield an increased performance in REM detection in the coming years.

On top of being able to accurately detect the existence of a REM stage, it is important to also be able to do so fast. As REM lasts between 5 (early in the night) to about 30 minutes (later in the night), a detection that occurs, say, after 4 minutes of the REM stage initiation might be useless despite its accuracy. Current works in neuroscience have shown the ability to detect REM with 86.2% confidence within 2 minutes from its initiation. Specifically, codes developed in humans and animals studies are showing promise for real-time sleep scoring (Huffman, 2021; Koushik, 2019; Kuwahara, 1988; Tezuka, 2021; Zhang, 2012). Presumably, efforts from tech companies interested in facilitating dream marketing would improve the performance even more to a nearly perfect detection of REM. It is likely that marketing managers would not engage with the development of tools for better real-time sleep scoring, but rather rely on neuroscience research to generate viable tools for the detection.

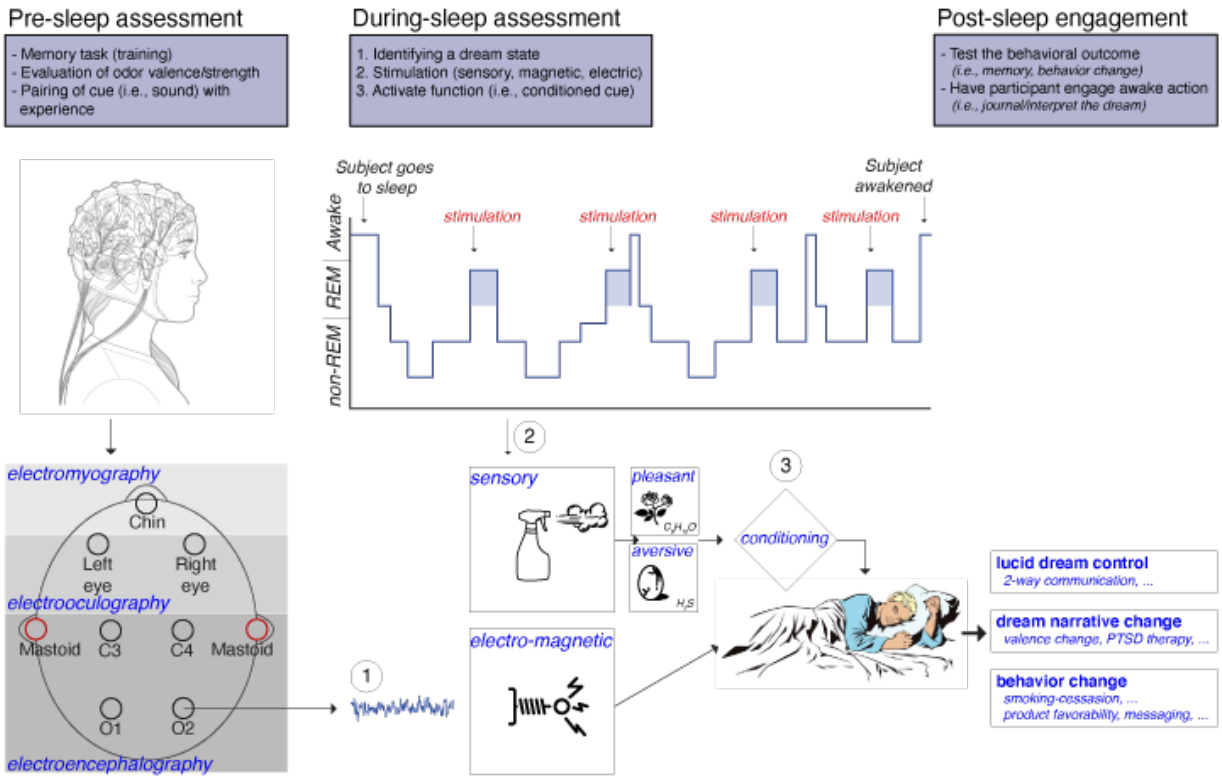

Figure 1. Induction of dream marketing. (left) Pre-sleep assessment involves setting up the cues, the conditioning stimuli, and the content that will be manipulated during sleep. Calibration of an EEG for sleep scoring, as well as electrooculography electrodes set near the eyes for REM detection. **(middle) During-sleep assessment** involves the detection of REM period **(1)**, within which a stimulation (via the senses or directly applied to the brain; **2**) occurs. The stimulation can aim to elevate an affective response (i.e., pleasant dream) or condition **(3)** a specific behavioral manipulation. **(right) Post-sleep** actions are useful to ensure that the manipulation translates to awake-behavior outcomes.

2.2. Stimulating the sleeping brain

Once REM stage is detected, the marketeer would want to induce a stimulation that would likely drive a certain behavior. Recent studies on dream stimulation have shown that nearly all senses can be engaged during sleep to generate a behavioral outcome (Dement, 1958). The difference between the stimulation types is in their successful outcome probability (i.e., the likelihood that the stimulation will drive the expected behavior consistently) and in the likelihood that they will awaken the dreamer. An ideal stimulation generates a predictable outcome without increasing the chances of awakening.

Of the stimulations recently investigated, the most reliable ones seem to be olfactory and auditory cues (Rechtschaffen, 1966; Schredl, 2009). Visual stimulation – typically involving a taping of the eyelids to remain open while flashing visual prompts – are considered disruptive to sleep (Rechtschaffen, 1965). Tactile cues (i.e., touching the dreamer's leg to generate a knee-jerk reaction which yields a qualitative experience of falling, or putting the dreamer's hand in water, which makes the dreamer incorporate water in their narrative; Dement, 1958) are reliable in their outcomes, but frequently wake the dreamer. Olfactory cues were shown to influence the dream valence. For example, spraying the smell of rotten-eggs (Hydrogen-Sulfide, H_2S), onto the dreamer's nose is likely to shift the dream towards an aversive narrative, whereas spraying the smell of roses (Phenethyl-Alcohol, $C_8H_{10}O$) is likely to elicit a pleasant dream. Those olfactory cues do not prompt the specificity of the smell itself (i.e., the dreamer does not dream of roses; Nováková, 2021).

The appropriate olfactory cues used for dream stimulation need to be calibrated prior to sleep along two axes: *valence* and *strength* (/concentration). A typical pre-sleep screening involves asking the subject to rank a collection of about 20 odors (presented in random order with about 2-4 repetitions each) along those two items: "How pleasant was the odor?", and "How concentrated was the odor?". Strong concentration (typically, ones ranked above 7 on a 1-10 scale) are more likely to wake the dreamer up. Weaker concentrations may not be registered by the dreamer. A concentration of 6 is typically useful

for the elicitation of the experience. The concentration strength can be modulated by diluting the compound, whereas the pleasantness is a property of the odor that is harder to modify. If a study participant ranks an odor that was expected to be pleasant as aversive, the researchers are better off using an alternative odor that is clearly ranked as positive.

To increase the chances of an odor activating a specific network of associations two types of cues are often used: (i) odor that in itself associates with the experience, or (ii) odor that is artificially associated with the experience pre-sleep. Odors that associate with an experience could be, for example, the distinct smell of a laundry detergent as a cue for that product, based on the dreamer's awareness of the association in a pre-test. In that case, injecting the smell of, say, a Tide detergent is likely to prompt the dreamers to elicit the network of associations they carry for Tide (notably, these might not be favorable). If a certain odor does not have a clear association, one can create the pairing artificially by evoking the concept while injecting the smell, repeatedly, during a pre-sleep task (i.e., a memory task where the appearance of the detergent image always aligns with the spraying of the to-be-associated smell).

2.2.1. Non-invasive neural stimulations

Overall, stimulation from one of the traditional sensory modalities (smell, audition, etc.) is a useful mechanism for penetrating the sleeping brain, yet the reliability of the stimulation performance might vary. An alternative stimulation mechanism involves direct activation of neural circuits. This can be done in both an invasive and non-invasive ways. Recent works in neuroscience have shown the ability to directly activate functional circuits in the brain using injected current applied to neural sites (invasive) or using magnetic fields generated by a magnetic coil placed a few centimeters above the subject's head (non-invasive). Those methods of neural activation have shown successful results in inducing functional outcomes (i.e., enhancing memory, or regulating emotions). Instead of prompting the percept of a laundry detergent by showing an image of the product and expecting that it will register in memory, one can directly stimulate memory circuits in a person's brain while they view the product and engage relevant recall-related functions.

Non-invasive stimulation uses tools such as transcranial magnetic stimulator. This tool provides an efficient, non-invasive, cheap, and reliable way to activate specific circuits. The magnetic coil in such stimulator is placed near the anatomical target (i.e., medial temporal lobe, if engagement of memory/affect is desired) and activated in certain frequency to evoke cognitive outcome (see **table 1** for typical neural sites, frequencies, and functions useful for marketing practitioners).

As an example, current works in neuroscience have shown the ability to use magnetic stimulation for induction of lucid dreams. Compounded by evidence that lucid dreamers can receive inputs from experimenters (Baird, 2021) and act upon those inputs (i.e., elicit a specific narrative in their dream), growing interest among scholars is devoted to helping subjects get into a lucid state where they can be guided towards a specific experience (i.e., imagine they are in a certain hotel that will then be offered as a real-world vacation promotion).

Function	Location	Frequency
Lucid dream	Simultaneously frontal and temporal regions	25Hz / 40Hz pulses during REM sleep
Memory activation	Frontal lateral regions	0.75Hz
Affective regulation	Left temporoparietal junction	Three 50Hz pulses, delivered at a rate of 5Hz
Enhanced attention	Right frontal eye field	1Hz

Table 1. Example of functions that can be activated using stimulation to yield behavioral outcome during sleep or pre-sleep.

2.2.2. Invasive neural stimulations

Invasive stimulators are neural implants injected neurosurgically into the brain of a person. The implants can induce low amplitude current using micro-electrodes that activate small clusters of cells (Merrill, 2010; Ronchi 2019). These implants are unlikely to be used by marketing practitioners soon, given their invasiveness. However, in the United States alone, there are already over 40,000 individuals who currently carry such implants in their brain for clinical purposes (i.e., taming of epileptic seizures or regulation of Parkinson's disease; Sokol, 2019; Strickland, 2017). The increase in clinical and therapeutic offerings that rely on neural implant, along with a growing popularity of recreational implants solutions, suggests a future where neural implants become viable tools in the consumer domains. In that future, consumer uses for the implants becomes a possibility.

2.3. Engaging a function that drives the desired behavior

If the goal of the marketing campaign is to motivate a certain desired behavior (i.e., favorable view of a product) it is not enough to evoke the thought of the product in the dreamer's mind. One also needs to ensure that the favorable view will be activated. Various methods were shown to be useful in prompting a behavioral change during sleep. For example, evoking the percept of smoking by spraying the smell of Nicotine into the nose of sleepers, followed by the smell of rotten eggs was shown to condition the pairing of the smoking percept with an aversive quality. Sleepers exposed to this conditions were 30% less likely to choose to smoke in following days (Arzi, 2014). Similar pairing of an auditory cue with pleasant/aversive odors was shown to alter the valence of the auditory cue (Arzi, 2012). Those examples demonstrate the power of a cue that appears simultaneously with a conditioned prompt to yield a behavioral outcome. While the subjects in such condition are likely to not know that the conditioning had occurred, the behavioral change are significantly amplified by it. Both auditory and olfactory cues were shown to work in such conditioning. The cues typically need to be calibrated pre-sleep to ensure that they indeed elicit the expected conditioning (i.e., an auditory cue used needs to be validated as positive to alter the preferences towards a certain prompt). For example, pairing the percept of product that is evoked using transcranial stimulation while injecting a pleasant odor may generate a positive view of the product. Similarly, using a competitor's product while delivering an aversive prompt could generate negative association (**figure 1**).

2.4. Cementing the dream prompt in awake behavior

As dreams are frequently forgotten upon awakening, one may wonder whether the entire endeavor of invoking an experience or a conditioned behavior during dream will be sustained upon awakening. While the answer to this question relies heavily on one's view of the function of dreams (i.e., if dreams are merely an epiphenomenon of neural activation during sleep and have no meaning, then dream conditioning might be less useful in the awake world) the assumption carried by numerous neuroscientists is that dream narratives are relevant to the awake life.

If the marketing practitioner operates under a *liberal* assumption that merely having the dream is sufficient to cement an outcome – then steps [1-3] are sufficient for the dream to yield a behavioral outcome. Indeed, experimental studies in sleep manipulation have recently shown that some manipulation that occur during sleep are sufficient to drive post-sleep effects (Hu, 2015).

If the marketing practitioners aligns with a more *conservative* approach, then an additional cementing of the manipulation is recommended. To ensure that the dreamer engages with the dream and facilitates the translation of the experience to awake behavior post-sleep one can attempt to secure a lasting awake-world behavior by asking individuals to reflect on their dream upon awakening. Asking participants to reflect on their dreams was shown to elevate the chances of incorporating dream content into one's awake behavior. Even if the story that is told by the dreamer is partially made up upon awakening (see Hsu, 2015 for an experiment showing that people who were awakened by a loud sound frequently conjured a dream narrative that was entirely based on the sound and not their actual dream content) the act of engaging with the dream and making up the story is valuable. Marketing practitioners who would prompt individuals to journal a dream based on content that was cued pre-awakening would benefit from the individual's belief that the dream memory emerged from their experience. In that scenario it is sufficient to ensure that subjects are awoken when the prompt of a product is activated (i.e., waking the subject up when the laundry detergent smell is present) to increase the likelihood that subjects craft a story incorporating the product's importance to them. Asking the subjects to not only journal their dream but also interpret its meaning is likely to elevate the significance of the narrative. The self-justification of the narrative and the cognitive demand to form a story out of an image is likely to imbue meaning, context, and personal relevance to what otherwise may not have had those properties. The closer to the awakening this happens, the higher the chances of altering the behavior. Similarly, if the dreamer can maintain closed eyes while journaling their dream, the chances of forgetting content are lower.

Overall, methods that ask individuals to generate a narrative to actions/thoughts that they believe emerged from their mind was shown to be a strong tool for personal attachment to an idea (Johansson, 2005; Strandberg, 2018). Importantly, it is not obvious that the meaning and narrative conjured by the dreamer will be favorable for the brand. In this case, like any marketing persuasive campaign, additional efforts should be made to encourage a desirable view of the product.

3. EXAMPLE DATA

To promote an academic conversation about the possibility of dream marketing and offer researchers/practitioners the ability to engage in

implementation and analyses of dream data, this work provides example data reflecting dream content induction. The data can be used to train marketing practitioners on examining REM stages, train machines to score sleep stages and to demonstrate how stimulation can yield behavioral outcomes. The data and instructions on usage and applications are located at: www.morancerf.com.

4. DISCUSSION

This work details a method for inducing marketing content onto a dream. The method has the potential to allow marketing managers to influence awake behavior. As dream incubation is becoming a viable option for marketing managers and is already being sought-after by large corporations it is useful to have marketing scholars examine the method, its potential, limitations, and ethical considerations. While dream incubation is still at its birth, growing body of works from neuroscience have shown that it can impact awake behaviors. The expansion of sleep research and the interest in sleep by the public are likely to increase the commercial offerings in this domain.

Dream research in marketing currently focuses on its use for ideation and creativity. Presumably, the lack of research on dream incubation is due to the novelty of the tool and the limited expertise among marketing practitioners in neuroscience implementations. An additional reason for the lack of research in the field could be the negative image that is evoked when one considers the possibility of behavioral manipulation that occurs when people's guards are down. That said, the fact that large corporations are beginning to explore the possibility of dream incubation suggests that scholarly research on the topic is necessary, if only so that the usage could be tamed. Providing the public with unbiased and transparent understanding of how dream incubation can occur is a first step towards an open conversation on the whether the topic should be used.

4.1. Ethical considerations

It has not escaped our notice that manipulating a person's behavior without their ability to truly consent (even if they do consent prior/after the manipulation) is fraught with ethical challenges. First, even if a person gave full consent to the manipulation one can ask whether the post-manipulation brain was not already subject to manipulation that yielded the consent (a dilemma that many neurologists are contemplating to-date with respect to other mind-altering treatments; Sokol, 2019). Even if full consent was given, it is still hard to know whether the consent is driven by an excitement about the notion of having governance over our dreams (i.e., lucid dreaming) but lack of understanding of the risks. Indeed, it is easy to imagine individuals who will be excited about the opportunity to control their dream and grant companies access to their sleeping brain without realizing that – like other free services (i.e., social media) – they are exposing themselves to manipulation. Further, while neuroscientists are exploring dream decoding and manipulation in laboratory settings, it is not clear whether such manipulation has negative long-lasting outcomes yet. The fact that experimentation in dream incubation is not regulated allows scientists to test conditions that are currently seemingly normative. However, further research might reveal that interfering with the natural sleep processes may have chronic negative consequences. Any research in marketing on the topic should be guided by new results from neuroscience and clinical work.

Especially given the mysterious and enchanting allure of dreams, it is important for marketing scholars/practitioners to maintain a sober view of the risks that stem from attempts to influence behaviors using tools that penetrate the brain. The temptations stemming from the fantastic possibilities may override the cautiousness required by users of the method and should therefore be at the forefront of everyone's mind. Marketing scholars also invest resources in identifying mitigating tools for the usage of dream manipulation so that they can offer ways to withstand an unbalanced commercial usage of the method. This is especially important since one can easily imagine a slippery slope where dream manipulation products start as an alluring offering for better dream experience, improved narratives, or entertainment (i.e., a dream directed by Steven Spielberg) and take a turn towards a tool for experience-manipulation later.

Indeed, in a survey conducted for this work with 709 individuals (ages: 34.9±13.9, 54.6% male) in the U.S. 83% said that they view dream manipulation as negative (5.1±1.9 on a scale of 1, approve dream manipulation, to 7, deny dream manipulation research).

This suggests that the dream marketing calls for additional consideration despite its successful outcomes in neuroscience.

Like the outcry about subliminal message in TV advertisement (prior to the emergence of research showing it was ineffective), dream marketing involving manipulation of behavior when one is asleep and unable to guard their brain from incoming inputs may challenge people's image of self-control and free-will, and yield negative perception.

5. CONCLUSION

While the notion of dream marketing is alluring and carries a serious potential to become a viable marketing tool in the future, it is still not a popular tool, and it is hard to implement without the right equipment and neuroscience expertise. As tools for dream incubation become cheaper, easier to use, faster to analyze, and available to marketing practitioners we may see a surge in companies testing and using dreams for marketing.

This work outlined the specifics of the method and some of the benefits and challenges of its application. More scholarly work will provide empirical data on the method's viability while generating guidelines for a proper use of neuroscience tools for persuasion and influence in marketing.

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