



Seeing is believing

Implications of the dreamlike cognitive style for waking spontaneous thought and psychopathology

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Abstract

The intuitive experience of dreaming is that we “see” something with our mind’s eye and react to it. Indeed, dream formation conceptualizations have often focused on the *visual image-to-verbal thought* direction of causality, inspired by bottom-up models of perception. However, despite being experienced as external to us, the dream environment is internally generated, meaning that dreams are more like imagination than perception. Dream thoughts (experienced with a sense of agency or selfhood) also affect subsequent dream images (experienced as non-agentive or external to one’s self). Thus, oneiric experiences are made up of reciprocal, continuous, moment-to-moment influences between the dream and the dreamer: visual images and verbal, abstract, or otherwise imageless thoughts. During wakefulness, a dreamlike cognitive processing dynamic of ever-changing meaningful image-thought-image momentary associations coupled with reduced agentive control of images may be present to a greater or lesser extent. Non-agentive visual images as a significant driving force in one’s spontaneous mental activity may relate to individual differences in fantasy proneness, suggestibility, dissociative absorption, or imagination tendencies. This feature carries implications for the field of spontaneous thought. Off-task thinking, or mind-wandering, are non-specific labels that may be used to denote internally generated mentation. Considering the tendency for dreamlike associations may represent a specific distinction, which may be relevant for understanding psychopathology. Whereas some individuals may find themselves distracted by abstract or semantic associations (e.g., verbal self-derogatory inner speech), others may find themselves drawn to intrusive—or alluring—visual images, which may interact significantly with their verbal thoughts and associations and even be experienced with decreased sense of agency. This may occur in obsessive-compulsive disorder, dissociative disorders, or maladaptive daydreaming, suggesting that clinicians need to pay attention to their clients’ spontaneous visual imagery. If a picture is worth a thousand words and seeing is believing, psychologists should be curious of how a visual thinking style may impact mental health.

Keywords

Dissociation · Dreaming · Imagery · Maladaptive daydreaming · Mind-wandering · Obsessive-compulsive disorder

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1 Introduction

“G and M walked into the restaurant. I wondered whether they were a couple. Then they kissed, as if to answer my question.”

(PART OF A DREAM REPORT, FROM THE AUTHOR’S PERSONAL DREAM JOURNAL, UNDATED)

In the present paper I aim to: (1) examine the dynamic alternation in dreams between verbal or abstract thought generation (usually experienced as thoughts belonging to the dreamer or dream ego), and visual imagery generation (usually experienced as the dream presented to the dreamer or happening to the dreamer, including persons, objects, and places experienced as distinct from the self). One such alternation is portrayed in the dream example above. (2) Next, I will relate this associative pattern to waking spontaneous thought by suggesting that some people are more prone to such a dreamlike waking cognitive style. (3) Finally, I aim to explore whether this framework for understanding patterns of internally generated spontaneous mental activity could contribute to discerning different types of psychopathologies, with a special focus on obsessive-compulsive symptoms, significant dissociative identity alterations, and a recently identified syndrome of compulsive fantasy addiction.

2 The origin of visual imagery in dreams: Dreams as continuous image-thought-image associations

Throughout history, dreams have often been viewed as a succession of images that together form a narrative or fanciful storyline. For most people, sensory dream elements are mostly in the visual modality (Snyder, 1970), not unlike the predominant perceptual mode in wakefulness (Posner et al., 1976). Henceforth, I will use the word “images” when referring to visual internal representations. There has been debate over whether this succession of oneiric images portrays a narrative, bears meaningful clinical significance, or even conveys an underlying message, on one hand, or rather whether it is random, epiphenomenal, or meaningless brain activation on the other hand. The former, narrative view is well represented in the classic writings of Freud (1900) and his successors as well as modern psychodynamic and other clinicians interpreting dreams with their clients, under the premise that the dream has a meaning and extracting it would be clinically useful (Gennaro et al., 2020; Hill et al., 2008; Schredl et al., 2000). In keeping with the impressions of clinicians working with dreams, there is some empirical evidence supporting the notion that dreamwork in therapy can facilitate self-understanding and adaptive outcomes (e.g., Hill & Goates, 2004). Recalling and working with dreams or utilizing various dream-related techniques has been suggested to contribute to personal growth, both by religions or cultural traditions (e.g., Savary et al., 1984) and

through the lens of empirical and practical psychology (e.g., Falk & Hill, 1995; M. Schredl in Hobson & Schredl, 2011; Konkoly & Burke, 2019; Provost, 1999). There is evidence relating dreams to the processing of salient emotional concerns, suggesting that perhaps emotion is the mechanism guiding the incorporation of elements into dreams (e.g., Malinowski & Horton, 2014a; Scarpelli et al., 2019). Moreover, dreams have been likened to psychotherapy, as they seem to associatively bind novel emotional events with loosely related existing concepts and memories and hence weave an integrated sense of self (Hartmann, 1998). Conversely, the view ascribing randomness to dream images arose during the 1970's primarily in Allan Hobson's "answer" to Freud (Hobson & McCarley, 1977). The theory had since then been revised and broadened but the basic claim was maintained: the succession of images in dreams is a psychologically meaningless, arbitrary flow of random activations originating from the brainstem, which the cortex then tries to tie together to a semi-coherent narrative. In other words, Hobson and colleagues argued that dreams are primarily made up of low-level internally generated signals, making their way to the cortex and being processed and synthesized by higher-order areas (Hobson & Pace-Schott, 2002; Hobson et al., 2000).

The Freudian "underlying message" view and Hobson's "random epiphenomenal" view could be seen as two extremes of a continuum suggesting different degrees of meaning in dream images and storylines. Where do most dreams lie on this continuum? Evidence accumulated over the years through scientific research suggests that dreams do seem to be related to current emotionally salient concerns or preoccupations and are continuous to some extent with the waking thought patterns characterizing the individual (Bulkeley & Domhoff, 2010; Domhoff, 2001, 2011a, 2017; Erdelyi, 2017; Koffel & Watson, 2009; Pesant & Zadra, 2006; Schredl, 2003; Sterpenich et al., 2007; Sterpenich et al., 2009; Van Rijn et al., 2015).¹ Preoccupations seem to affect dreaming especially in those who tend to suppress or avoid their emotions (Alfasi & Soffer-Dudek, 2018; Malinowski, 2015), lending support to the notion that dreaming is involved in processing emotion. Hobson himself fully agreed that dreams incorporate some experiences or memory traces from waking life, however, he downplayed their importance compared to continuity theorists, and stated that he was more interested in better understanding novel or discontinuous dream elements (Hobson & Schredl, 2011). Thus, the completely random extreme of the continuum would be difficult to support empirically.

However, the other end of the continuum, namely, the Freudian notion that dreams convey an underlying complex message, conflict, or idea (Freud, 1900), implies that the process of dream generation is one of creating a coherent story or that the dream is a whole, with a specific starting point and ending. Is the ending of a

¹ Different interpretations of continuity may be found in the literature cited here, a discussion of which is outside the scope of this work. Also, note that the degree to which dreams may be meaningful, in that they are related to waking life or waking thought, is a separate question from whether they have an adaptive function (Blagrove, 2011). The latter question is also outside the present scope.

dream already planned while the dream is starting out? If so, who is the homunculus screenplay writer directing the scenes in such an integrated way?² This idea is also probably unrealistic. Just as our waking thought may be seen as an endless stream of associations (James, 1890), so are our dreams spontaneously changing from moment to moment, each shift in experience guided by its predecessor. In that sense, dreams are perhaps the ultimate manifestation of spontaneous thought (Christoff et al., 2016), due to the reduced executive control and meta-cognition, manifested in prefrontal deactivation (e.g., Braun et al., 1997; Dang-Vu et al., 2007). Moreover, compared to waking thought, this moment-to-moment change is hyperassociative (Hartmann, 1996; Horton & Malinowski, 2015; Llewellyn, 2013; Malinowski & Horton, 2015) and tends more to blend or associate different modalities, similar to synesthesia (Reznik et al., 2018). Arguably, the two main alternating modalities in dreams are visual images (experienced as reminiscent of visual perception or “inner seeing”) on one hand, and verbal or unsymbolized abstract thoughts on the other hand. By verbal thoughts I refer to inner speaking or hearing, including the experience of specific words being present, spoken, or heard, and possibly voice and tone inflection, whereas unsymbolized thought does not include these elements (Hurlburt et al., 2013). However, Hurlburt and colleagues mention that many people do not naturally notice this distinction. Rather, they may quickly translate preverbal to verbal mental activity and pay attention only to the latter. For the purpose of the present work, the distinction between preverbal and verbal mental activity is inconsequential, as my focus is on imagery versus image-less thoughts (See Hurlburt et al., 2013 for a formal discussion of the properties of each type of inner experience; and Hurlburt et al., 2022, for their frequencies using different assessment methods). To conclude, for most people dreaming seems to be mostly the experience of *seeing* and verbally or abstractly *thinking*.³ This could also be construed as a division between the dream (that is not experienced as our own creation, i.e., is non-agentive), and the dreamer (experienced as our own thoughts and beliefs during the oneiric event, i.e., the agentive part of the dream), respectively.

3 Dispelling the purported hierarchy between visual and verbal thought: Images are also associatively activated

Abstract or verbal thoughts in dreams have usually been viewed as a higher-level response to dream images, which were viewed as a lower-level mental element. In other words, intuitive or old-school perceptions of dreaming have focused on the

² See (Dennett, 1976) for a lengthier discussion on this topic.

³ Relatedly, at least in sleep onset dreams, a preliminary single-case study showed that linguistic versus perceptual dream intrusions into consciousness were associated with differential neural correlates (Noreika et al., 2015).

image-to-(abstract) thought direction of causality, inspired by bottom-up models of perception, likening dreaming to waking perception (Foulkes & Domhoff, 2014). This is exemplified in Hobson's activation-synthesis model described above: low level activation flows from the brainstem creating random images which are then synthesized by higher "thinking" parts into a story of sorts (Hobson & Pace-Schott, 2002; Hobson & McCarley, 1977). The image-to-thought view is also strongly implicated in the notion that in (non-lucid) dreams, the dreamer simply reacts to dream events, with reduced volition, rather than shapes and directs them with reflective awareness (Rechtschaffen, 1978).

However, it has been argued that dreaming is more like imagination than perception (Nir & Tononi, 2010), and images are themselves a type of internally generated thought. They are not bottom-up memories either: exact episodic memory replay in dreaming is rare, and dream images are better construed as novel creations of the mind (Malinowski & Horton, 2014b; Schwartz, 2003). Hence, dreams are made up of continuously reciprocal moment-to-moment influences between visual images and verbal or abstract thoughts, meaning that such thoughts shape dream images, and not just vice versa. An example of an abstract thought shaping the dynamic flow of images in a non-lucid dream is presented above through a section of a dream from the author's personal dream journal. This example is an introspective phenomenological self-report, which, despite important technological advances in the scientific study of dreams, is still central and even critical for studying dream consciousness (Sikka, 2019). The dream example portrays how the dreamer reacts to an image with a non-visual thought, which then, in turn, generates a new visual image. It is clear in this example that the image of the couple kissing was directly influenced by the thought that preceded it, but during the ongoing dream, it does not subjectively feel that way. This is because the thinking part of the dream is experienced with a sense of agency (*I* was wondering whether they were a couple), whereas the oneiric images feel like an external event rather than our own mind's creation. Yet, images in dreams are meaningful thoughts or associations, even though they are non-agentive. In other words, nocturnal dreams seem to be made up of ever-changing image-thought-image momentary associations, which are probably influenced by the dreamer's cognitive schemas, guiding associative mental activity in both sleep and waking. Accordingly, it has been previously theorized that the dream "ego" continuously reflects upon, and responds to, the dream imagery throughout the dream in a process of synchronous moment-to-moment co-creation (Sparrow, 2014).⁴ This also relates to previous works acknowledging that high-order cognitive processing is common in nonlucid dreams (Kahan & LaBerge, 2011; Kozmová & Wolman, 2006; Wolman &

⁴ A similar rapid circular dynamic of visual image formation as both affected by, and affecting, the temporal sequence was described regarding brief sleep onset dreams, but in the context of neuromuscular sensations, auditory elements, and various other exogenous stimuli (Nielsen, 2017).

Kozmová, 2007), and that dream imagery is often representative of metaphorical, figurative thinking (Hall, 1953).

To conclude, the creation of meanings, words, and images are all part of a top-down process during dreaming (Cicogna & Bosinelli, 2001). Our minds not only respond verbally or semantically to visual stimuli, but also respond visually to semantic associations, together creating a visual-verbal associative, perhaps even iterative, trail. Notably, this succession of mutual influences from images to thoughts and vice versa may be affected or modulated by various higher-level and lower-level processes, such as the individual's personality and cognitive characteristics (Hartmann & Kunzendorf, 2006), conceptions and personal concerns or preoccupations (Domhoff, 2017), motivational/reward system determining which memories to incorporate through emotional relevance (Perogamvros & Schwartz, 2012), and memory consolidation or reprocessing needs (Cicogna & Bosinelli, 2001).

Notably, it is convenient to use the term "top-down" to convey the idea that dream images are associative visual thoughts rather than sensory input, but in the last decade or two it has become increasingly acknowledged in the field of visual processing that the concepts of "bottom-up" and "top-down" are poorly defined and are perhaps overly simplistic, which may also apply here. Specifically, the process of seeing and interpreting the world is now considered to involve numerous levels and junctions of flowing information with various feed-forward and feedback influences (Rauschenberger, 2010; Rauss & Pourtois, 2013), and the same could be said about dream associations. The ongoing image-thought-image flow in dreams may be a primarily top-down process but at the same time involve both feedforward and feedback processes between images and non-visual thoughts. This view of dreams is compatible with current formulations in the field of visual processing, hypothesizing distributed, non-hierarchical processing in higher areas, as opposed to the hierarchical exchange of information postulated previously (Hegdé & Felleman, 2007; Rauss & Pourtois, 2013).

The notion that mental activity or the flow of associations in dreams is a combination of visual and non-visual thinking, both representing high-level processes, is supported by research showing that the subjective experience of a dream seems to stem largely from cortical activity. Specifically, cortical regions associated with imagination and thinking are activated when individuals experience dream imagery (Bréchet et al., 2020; Siclari et al., 2017) and dream thoughts (Perogamvros et al., 2017), respectively. Although bottom-up influences also modulate the development of a dream (Cicogna & Bosinelli, 2001), as can be inferred from subcortical activations (e.g., Bréchet et al., 2020), I maintain that the central associative process of the image-thought-image experience in dreaming is a higher, largely cortical event, attesting to the human ability to think pictorially.⁵

⁵ Notably, it has been shown that the direction of cortical information flow during waking visual imagery production is reversed compared to waking perception, using two different causality methods, supporting the classic distinction of top-down and bottom-up processing (Dentico et al., 2014). Perhaps future neuropsychological studies could provide evidence for similar top-down

4 Predictive coding and dreaming: Are visual-verbal associations in dreams top-down expectations?

One perspective considered more nuanced than the top-down – bottom-up distinction is the predictive coding framework. Predictive coding theory pertains to the continuous updating of predictions from an internal mental model of the world following feedback based on errors in those predictions (Friston, 2018; Rao & Ballard, 1999). Predictive coding is considered a bidirectional process which involves both bottom-up and top-down streams of information (Friston, 2018). Hobson et al. (2014) suggest that the predictive coding framework can be applied to dreaming and that dreams may lay the foundations for waking perception by refining the model in a simple environment free of sensory constraints. Llewellyn further elaborated on this idea suggesting that dreams represent *prospective* coding, which is the offline process of creating the codes and expectations that would eventually enable waking predictive coding (Llewellyn, 2015).

Arguably, it could be said that the succession of thoughts and images in dreams is in essence our attentional spotlight. In dreaming we “see” and think about, only what we are attending to; objects outside our attention span simply do not exist. Predictions and expectations guide the associative visual-verbal trail, without the corresponding external feedback or learning from prediction errors that occur in waking. This associative trail is meaningful because it reveals our expectations and mental model of the world: showing the movement of attention in the absence of external interference. Thus, it could be argued once again that dreams follow the individual’s cognitive schema and represent high-level processes or pictorial, figurative thinking (Hall, 1953).

Notably, however, Hobson and colleagues claim that the hypoactivation of the prefrontal cortex that characterizes the dream state means that the dream is freed from “the top-down constraints of narratives and perspective-taking” (Hobson et al., 2014, p. 8), suggesting that in their view, dreaming is a lower-level process, perhaps not significantly affected by constraints relating to the “self”, as manifested in prefrontal self-reflective awareness. This brings us back to the unresolved debate outlined above, namely, the question of the extent to which our personality, waking thought patterns, and expectations affect the flow of associations (primarily images and thoughts) in our dreams.

Based on the vast literature relating both dream content and structural characteristics of dreaming to our waking emotions and concerns (e.g., Domhoff, 2011a; Malinowski et al., 2014; Malinowski & Horton, 2014a; Schredl, 2008; Schredl & Reinhard, 2010), level of distress and emotional arousal (Levin & Nielsen, 2009; Soffer-Dudek, 2017a), and thought patterns and personality (Hartmann & Kunzen-

directionality during dreaming, to provide further support for the idea that dreaming is more like imagination than perception (Nir & Tononi, 2010).

dorf, 2006; Koffel & Watson, 2009), it seems plausible to say that even if dreams do not tell a coherent story or convey a full message from start to end, the momentary associations of alternating images and thoughts have some psychological meaning and relate to who we are and how we see the world. That is probably why many people find dreams helpful or significant for self-understanding (Beaulieu-Prévost et al., 2009; Hill & Goates, 2004; Morewedge & Norton, 2009). The realization that not only do images lead to thoughts, but vice versa as well, as exemplified in the dream excerpt above, elucidates how neuroticism, distress, and negative emotions cascade into nightmares (Levin & Nielsen, 2009). The dreamer's cognitions, personal associations, and expectations affect the dream images as they are being created in the ongoing oneiric scene.

Considering the oneiric image-thought-image never-ending dynamic as a primarily top-down or feed-forward process establishes it as part of our mental model or associative framework: the model or framework through which we perceive and think in waking as well. For example, the degree to which we tend to blend different thoughts in waking (thin boundaries) correlates with the degree to which our dreams blend different concepts, resulting in increased bizarreness and hyper-associativity (Hartmann & Kunzendorf, 2006; Kunzendorf et al., 1997). Additionally, people with a tendency for unusual waking perceptions and experiences, as manifested in dissociative experiences and schizotypy, also tend to have more unusual dreams (Koffel & Watson, 2009). Finally, having the experience of control in lucid dreams seems to relate to a sense of control in waking (Aviram & Soffer-Dudek, 2018; Blagrove & Hartnell, 2000; Patrick & Durndell, 2004; Soffer-Dudek et al., 2011). These findings focus on individual differences in the ways in which people perceive the world in both the sleep state and the wake state. Below, I will discuss one more feature of dreams, and then examine whether there may be individual differences in a tendency for dream-like waking thought.

5 Agentive and non-agentive control in lucid and non-lucid dreams

Our state of mind in prototypical dreams is commonly described as reactive and passive (e.g., Rechtschaffen, 1978). Conversely, lucid dreams, dreams in which the dreamer is aware of their conscious state while dreaming (LaBerge, 1985; Van Eeden, 1913), are sometimes characterized by an experience of controlling the dream events. Notably, many lucid dreams lack this possible accompanying feature, and dreamers retain only the awareness of dreaming without any associated sense of control (Aviram & Soffer-Dudek, 2018). Such a combination (i.e., reflective awareness of dreaming devoid of a sense of control) has been associated with psychopathological distress (Aviram & Soffer-Dudek, 2018; Harb et al., 2016). Interestingly, even when lucid control is achieved, the control does not seem to be perfect, but rather partial (Windt & Voss, 2018), with unexpected distractions, and

subordinate to bizarre dream logic (e.g., see [Schädlich et al., 2017](#)). Importantly, the dream this paper started out with underscores that significant control of the dream exists in non-lucid dreams as well, although it may not necessarily be experienced as control. We might verbally or abstractly think of something, and it will magically visually appear in our dream; we might wish for something, and the dream may steer us in that direction; these are thought-to-image influences, and they may explain why some people have benefitted from training in lucid dream therapy even though they failed in achieving lucidity ([Spoomaker et al., 2003](#); [Spoomaker & Bout, 2006](#); [Zadra & Pihl, 1997](#)): they may have experienced increased control and positive outcomes following a change in waking thought, which in turn affected their dream thought, even if they did not experience lucid reflective awareness within their dreams. Our abstract thoughts conjure up images as an immediate association, giving us a certain (albeit limited) amount of control of dream images through our associative thinking patterns, even in the absence of lucid/reflective awareness ([Sparrow, 2014](#)).

I propose that what in fact characterizes controlled lucid dreams is a sense of agency in navigating the dream events, which could be termed *agentive control*. An individual experiencing agentive control in a dream may feel that they are navigating the trail of verbal-visual associations with much more guidance and executive control over their attentional spotlight. Indeed, lucid dreaming is associated with higher prefrontal activity ([Voss et al., 2009](#)), which is usually deactivated in dreams compared to waking ([Bréchet et al., 2020](#); [Dang-Vu et al., 2007](#)). Agentive control is quite rare in dreams as it is missing both from prototypical nonlucid dreams and from some lucid dreams. Moreover, there can be a strong sense of lack of control or inability to alter dream images/events, both in non-lucid and in lucid dreams (the latter often referred to as lucid nightmares), and as mentioned before, this may be indicative of distress.

Although a sense of agency or agentive control over our thoughts and actions is much more available to us in waking than dreaming, waking sense of agency is also subjected to significant individual differences. People will differ in the extent to which their behavior is experienced as willed versus automatic, relating to the concept of dissociative “absorption and imaginative involvement,” characterized by a tendency to act automatically with reduced sense of agency ([Bregman-Hai et al., 2020](#)), alongside strong imaginative abilities ([Bregman-Hai et al., 2018](#)). Below, I will suggest that such individual differences may mark the existence of a dreamlike cognitive style of spontaneous waking thought, including a combination of both elaborate imaginative processing (image-thought-image associations) and reduced sense of agency. Indeed, some individuals may mix sleep-wake states more than others ([Soffer-Dudek, 2017a](#)). The waking cognitions of certain individuals may be more dreamlike ([Kunzendorf et al., 1997](#); [Van der Kloet et al., 2012](#)) just as some people’s dreams may be more wake-like (e.g., regarding memory access, motor excitation, or emotional arousal, see [Soffer-Dudek \(2017a\)](#)). I suggest that people with a salient dreamlike thinking style tend to experience such an associa-

tive pattern in waking, where non-visual thoughts provoke novel images which then provoke further thoughts, and this pictorial associative trail may be experienced with little agency. I will now turn to discussing individual differences in the salience of waking visual thought.

6 Individual differences in visual, pictorial, or imagery-led thinking during wakefulness, with reduced agency: The dreamlike cognitive style

There are considerable individual differences in people's ability or ease in conjuring up novel visual image associations, as can be inferred from the research literature on imagery (e.g., D'Argembeau & Linden, 2006; Iachini et al., 2019; Isaac & Marks, 1994), the tendency for imaginative involvement (e.g., Bregman-Hai et al., 2018), suggestibility (e.g., Crossman et al., 2004), and "fantasy-proneness" (e.g., Merckelbach et al., 2022). High vividness of imagery relates to an immersive experience or sense of presence, but these do not necessarily imply agency and control over one's imagery, as the ability to control imagery is only weakly related to these constructs (Iachini et al., 2019). Research on mild dissociative experiences ("absorption and imaginative involvement"; Carlson & Putnam (1993)) may be especially relevant as it taps into a combination of acting automatically with reduced agency (Soffer-Dudek & Somer, 2022) and being prone to be led by one's internal images, as a result confusing real events with those that were only imagined or dreamt (Soffer-Dudek, 2017b; see also Wamsley et al., 2014 for another account of such confusion). Absorption and imaginative involvement is a trait that assesses an inclination to become immersed in daydreaming and other internal and external stimuli to the point of obliviousness to one's current surroundings, pointing to a state of mind characterized by a narrow attentional spotlight (Soffer-Dudek et al., 2015) with little meta-cognition, somewhat reminiscent of the "single-mindedness" of dreams (Rechtschaffen, 1978). The concept of absorption and imaginative involvement relates to common experiences that to some degree occur in most people, and low-to-moderate levels are not necessarily indicative of psychopathology, although high levels are associated with various types of psychopathologies (Soffer-Dudek et al., 2015). Regardless of psychopathology, in a selected healthy sample, participants who scored high on absorption and imaginative involvement seemed to have a distinct cognitive profile. Specifically, in most executive functioning and working memory tasks they had decreased accuracy, stemming from commission rather than omission errors; but on a mental rotation task, requiring mentally rotating a visual stimulus, they were much faster than their counterparts, with no significant loss of accuracy (Bregman-Hai et al., 2018). The authors concluded that these individuals probably experience images as more salient and vivid, and consequently can manipulate them with ease; yet their tendency for an elaborate visual process-

ing style may also lead to confabulation and hence, inaccuracy in other working memory tasks.

The cognitive style of thinking in pictures or readily conjuring up novel images may be seen as a tendency for image-thought-image associations or more dreamlike thinking during waking. This is opposed to people who have less of an inclination towards waking imagery or pictorial thought, who tend to focus mainly on verbal or abstract semantic concepts during wakefulness. For example, people may be distraught by negative semantic self-evaluations or abstract self-derogatory and self-critical appraisals (e.g., “you are worthless”), predisposing them to depression (Shahar, 2015); conversely, others may be inclined to imagine themselves repeatedly being victimized or abused in different, novel ways (Somer, Abu-Rayya, et al., 2021). Both are indicative of maladaptive, self-berating associations, but one does not necessarily involve salient images, whereas the other is significantly affected by imagery. Such differing cognitive styles may predispose different individuals to specific psychopathologies and bear implications in terms of appropriate psychotherapy. In both, a sense of uncontrollability and automaticity is associated with psychopathological distress. In other words, waking spontaneous thought may be driven by negative affect, as seen in cognitive biases in anxiety and depression (e.g., Krantz & Hammen, 1979; Miranda & Mennin, 2007), regardless of whether the associations involve visual imagery. When the flow of associations is experienced as automatic, biased, or intrusive the individual may feel significant psychopathological distress. It has been suggested that more automaticity means more constraints, translating to less spontaneous or free-floating thought, as can be seen for example in rumination (Christoff et al., 2016). However, Christoff and colleagues did not differentiate image-based associations from imageless ones. I will argue that salience of imagery or the tendency to experience thought-image-thought chains in waking spontaneous cognition predisposes to specific psychopathologies.

7 From dreaming to waking: The dreamlike cognitive style as a framework for understanding types of spontaneous thought, and its relevance for psychopathology

With a paucity of external sensory input, dreams provide a unique opportunity to study the workings of the mind. In this paper, I focus on the image-thought-image two-way streak identified above to offer a potentially useful distinction of types of mind-wandering or spontaneous thought: those with salient imagery associations, versus those without.

Specifically, mind-wandering is an umbrella term referring to mental activity that is either experienced as unintentional or free-associating, or is unrelated

to the task at hand, or is intrinsically generated (Seli et al., 2018). It has been suggested to represent a subtype of spontaneous-thought phenomena, i.e., thoughts that arise freely with weak deliberate constraints, alongside nocturnal dreaming and creative thinking (Christoff et al., 2016). Nocturnal dreaming and mind-wandering/daydreaming have all been associated with the default mode network and purportedly use the same simulation processes (Domhoff, 2011b). However, off-task thinking, mind-wandering, or spontaneous thought, are concepts that are loosely or broadly defined, that need to be better conceptualized (e.g., Christoff et al., 2016, 2018; Theodor-Katz et al., 2022). These concepts could be used to denote very different types or patterns of off-task mentation, including rumination, worry or free-floating anxiety, incoherent associative, distractable, and unguided thoughts, pondering the day's to-do list, intrusive imagery, or even fanciful, alluring images or stories (Theodor-Katz et al., 2022).

Importantly, different types of associative mental activity play pivotal roles in the formation of different psychopathologies. A tendency for dreamlike thought, i.e., pictorial thinking and strong image-thought-image associations with reduced agentive control, as a driving force in our mental activity may be one potentially useful distinction. Such imagery-driven or dreamlike mind-wandering may predispose a distressed individual to certain types of maladaptive spontaneous cognitive patterns, namely, intrusive images or images that create or significantly interact with anxiety. Such imagery is associated to a great extent with obsessive-compulsive symptoms, dissociation, and excessive fantasy. The next sections will discuss the role of spontaneous novel imagery or image-thought-image associations in all three of these clinical conditions, all three of which are also theoretically or empirically associated with reduced sense of agency. Finally, I will present some concluding ideas about dreamlike spontaneous waking thought, including implications for interventions.

8 Dreamlike cognitions in obsessive-compulsive disorder

I suggest that the continuous succession of images to verbal or abstract thoughts and from such thoughts to images, as described above regarding dreaming, may be especially relevant to understanding the dynamics of obsessive-compulsive disorder (OCD). Intrusive imagery is a central feature in OCD (Bouvard et al., 2017; Lipton et al., 2010; Rachman, 2007; Speckens et al., 2007). Here is one case example for how a distressing thought turns to an intrusive image in a patient with OCD:

Whenever I see or hear an aircraft overhead, I look at it initially I think, a nice sight, I see the trailers coming from the engines and then picture the people inside, that they might be getting ready to land, pilot speaking to them and then I think I hope it doesn't blow up or something like that and

I get pictures of the engines on fire, surrounded by giant orange flames and black smoke and then I visualise the whole plane blowing up.

(TAKEN FROM: LIPTON ET AL., 2010, P. 820)

The thought “I hope it doesn’t blow up” is instantly translated to the associated images of an aviation disaster. Possibly, individuals prone to develop OCD may be those who tend to think visually or easily conjure up a novel image in response to an abstract idea (Soffer-Dudek, 2023). A tendency for an image-thought-image (or dreamlike) cognitive style may mean that their mental imagery is especially salient or vivid, rendering it harder to get rid of or control, i.e., more intrusive. Indeed, people with OCD have an impaired sense of agency (e.g., Oren et al., 2016, 2019). Interestingly, the memory associated with the intrusive image of the plane described above involves an experience of helplessness and reduced agency, as the patient describes their frequently getting arbitrarily punished as a child even though they did nothing wrong (Lipton et al., 2010). Intrusive imagery may lead to dissociative immersion and engulfment in the obsession. Accordingly, obsessive-compulsive symptoms are strongly associated with dissociation and especially with absorption and imaginative involvement (Soffer-Dudek, 2014, 2017b, 2019, 2023; Soffer-Dudek et al., 2015). A vivid, hyperactive, or easily triggered imagery system or an imagery-led cognitive style would also result in imagined possibilities being more easily confused with reality. This is known in the literature on OCD as the cognitive tendency for “inferential confusion” (Aardema et al., 2005; O’Connor & Robillard, 1995). Individuals high in inferential confusion tend to rely excessively on their imagination at the expense of trusting their sensory input, and this predisposes them to OCD (Aardema et al., 2005; Aardema & O’Connor, 2003; O’Connor & Robillard, 1995). In the case example above, the patient is concerned that their unsolicited thoughts will somehow put the plane in danger of actually blowing up (Lipton et al., 2010). As expected, inferential confusion is strongly associated with dissociative absorption and imaginative involvement, and both predict OCD with significant shared variance between them (Aardema & Wu, 2011; Pozza et al., 2016). Relatedly, in an exploration of the dream characteristics of people with obsessive-compulsive symptoms, an especially strong predictor was dream-reality confusion (Yu, 2013), possibly alluding to the salience and vividness of dream imagery or the impressions they leave behind.

Notably, pictorial thinking *cannot include negation*; thus, an abstract thought such as “I hope the plane doesn’t blow up” or “I would never want to have sex with another woman” would, paradoxically, conjure up an image of the negated event as if it were occurring (Soffer-Dudek, 2023). The patient depicted in Lipton et al. (2010) reports their resulting guilt at the prospect of the plane being physically harmed following their thoughts and images, and consider themselves to be “evil”, retroactively attaching malicious intent to oneself even though the conjured-up image was intrusive and unwanted. Similarly, an image of having sex with another woman would probably immediately raise guilt-ridden abstract thoughts or

speculations such as “Perhaps I secretly do desire to have sex with other women?” Such a speculation would be especially likely in people with OCD as they tend to allocate exaggerated meaning to their spontaneous images and thoughts (Shafran & Rachman, 2004). Thus, the tendency to engage in thought-image-thought reciprocal associations may predispose individuals to OCD. Future studies should examine whether nocturnal dreams in OCD would be recalled as more vivid.

9 Dreamlike cognitions in dissociative identity disorder

A tendency for absorption and imaginative involvement is considered to represent dissociation (Carlson & Putnam, 1993; Soffer-Dudek & Somer, 2022) and is elevated in samples with dissociative identity disorder (DID) (Leavitt, 1999, 2001; Ross et al., 1995).⁶ DID is a disorder inherently characterized by a decreased sense of agency as one’s emotions, memories, thoughts, and behaviors are attributed to parts experienced as “not-me” or independently agentive (Soffer-Dudek & Somer, 2022). Imaginative involvement may play a pertinent role in the disorder as some individuals with DID present with a rich and complex inner world. Images and thoughts probably rapidly interchange as abstract thoughts and feelings are instantly metaphorically translated into the musings of visualized alternate agentive identities. This is exemplified in the following clinical excerpt from a therapy session with a person suffering from DID, who believes (or rather, most of her experienced parts believe) that she has endured satanic ritual abuse:

Therapist: What’s going on with those guys on the inside right now?

Patient: They think you’re trying to trick them. They’re telling me not to listen to you.

(TAKEN FROM: ROSS, 2018, P. 169)

The patient, experiencing herself as a host for several agentive identities, continuously creates a complex inner space where metaphorical parts of her self produce dialogues and create a narrative. For example, in the excerpt presented, her probably preverbal or abstract thought according to which she should feel suspicion towards the therapist instantly translated into an internal scene where characters or parts with shared lived experience were imagined to be the source of inner speaking, conveying that thought. Although we cannot know for sure that this

⁶ The notion that the absorption construct represents dissociation is a convention in the literature, but notably, “structural dissociation” theorists do not agree with that idea. This discussion is well beyond the scope of this work, but the interested reader is referred to Soffer-Dudek & Somer (2022) for an elaboration on the disagreement as well as an in-depth characterization of the dissociative nature of absorption.

was experienced visually, many patients with DID report the visual properties of alternate identities or even inner locations, suggesting that at least for some, this dynamic includes a strong visual element. Thus, we may assume that the client experienced an associative chain whereby abstract thought led to visual imagery, which in turn led to verbal inner speaking. In a later part of the session, following a discussion about the death of the patient's father, the visual properties of the client's thought pattern are even more strongly implied through her description of a non-verbal inner event:

Therapist: What are the cult alters doing right now?

Patient: They're crying.

Therapist: What are they crying about?

Patient: You said their father is dead.

(TAKEN FROM: ROSS, 2018, P. 170)

Again, an abstract idea (father's death, mentioned by the therapist), or perhaps an abstract feeling (sadness), seems to be translated into a probably visual experience of crying alters. DID is a disorder that involves self-hypnosis or auto-suggestion to a great extent (Pancheri et al., 2017), similar to conversion disorder (Oakley, 1999). In hypnosis, verbal suggestions "looking for" certain things inside one's mind lead to the instantaneous creation of corresponding images, which then translate to novel abstract ideas or meanings. Again, this process is similar to the dreaming mind, where verbalized thoughts provoke images which in turn generate further thoughts, and this process is accompanied by reduced sense of agency. It is also reminiscent of the process of "knowing" in a dream what non-self dream characters are thinking or feeling. The dreamer projects their own ideas on an experienced, visualized separate agent. Indeed, as identified by Deirdre Barrett almost 30 years ago in an investigation of the dream characteristics of people with DID:

For most people, the state of dreaming is characterized by a degree of hallucination, amnesia, discontinuity with normal experience, and projection of aspects of themselves onto others that they experience at no other time. One of the most striking observations of this survey is that dissociative disordered persons experience much more of this dreamlike state in their waking life." (Barrett, 1996, p. 80)

Somewhat relatedly, patients with dissociative disorders tend to have clinically significant nightmares (Agargun et al., 2003), and various milder dissociative experiences have been related to several types of disturbed dreaming and unusual sleep experiences, pointing to possible shared mechanisms (Koffel & Watson, 2009; Soffer-Dudek, 2017a; Van der Kloet et al., 2012; Watson, 2001). Further study is needed on nocturnal dreaming characteristics in DID (e.g., vividness, bizarreness).

10 An imagery disorder: Maladaptive daydreaming

Maladaptive Daydreaming (MD) is a recently suggested syndrome or disorder, whereby the essence of the person's problem is excessive, addictive immersion in vivid, intensely emotional, and narrative waking fantasy (Somer, 2002; Somer, Soffer-Dudek, Ross, & Halpern, 2017). During immersion in their fantasy activity, people with MD may laugh, cry, or become excited; they may feel intense love, sadness, or hate towards their imagined characters. Maladaptive daydreamers report a constant urge to engage in this activity, with varying degrees of agency and control versus intrusiveness. Specifically, some experience their fantasies as appearing spontaneously or automatically, especially if they are bored or distressed, and particularly if they experience triggers like evocative music, books or tv shows, or stereotypical movement (Bigelsen & Schupak, 2011). Stereotypical movements may include, for example, pacing, running, twirling, hand or finger movements, or rocking one's body or limbs (Bigelsen et al., 2016; Jopp et al., 2019). These movements seem to aid daydreamers in inducing self-hypnosis by immersing themselves into a trance-like absorptive fantasy state (Somer, Cardeña, et al., 2021).

The following excerpt describing one maladaptive daydreamer's experience exemplifies how excessive novel imagery has taken over her waking consciousness in an intrusive way, with reduced agency:

My imagination would come bursting in at the worst of times, for example during an exam or at the dinner table [...] in the form of dancing figures [which] would burst through the doors and windows of whatever room I was in, they would sing, spin and laugh around me, making jokes and encouraging me to join them. I always found them irritating. I wanted, needed to concentrate but couldn't with all the racket they were causing. So, I would come up with imaginary scenarios to get rid of them (a black hole swallowing them up, a rainstorm washing them away in a flood, a dragon flying in and scaring them off), which of course drew me deeper into the world of fantasy [...]

(TAKEN FROM: SOFFER-DUDEK & SOMER, 2022, P. 549)

Others will actively and purposefully create the situations that may enable the fantasy activity, in a more premeditated way (e.g., turn down a social invitation so that they can daydream comfortably in the solitude of their home, purposefully go jogging with music on or close the door to their room and start to pace in circles). Often maladaptive daydreamers will report that they feel a growing urge to engage in their stories and inner world, until they cannot withstand it anymore and therefore submit to it, like an itch that needs to be scratched, or like any other behavioral addiction (Pietkiewicz et al., 2018; Somer, 2018). Importantly, not all individuals with the ability for immersive daydreaming necessarily suffer from

maladaptive daydreaming (West & Somer, 2020). The defining feature of maladaptive daydreaming is its maladaptivity, defined like any other psychiatric syndrome according to the person's own account of distress and interference with life goals and functioning (Soffer-Dudek et al., 2020).

Importantly, MD is different than rumination, obsessions, or post-traumatic flashbacks, in that the storylines are novel and unique in each daydreaming episode. In that sense, it is a very creative syndrome, involving spontaneous thought to a great extent. On the other hand, it is also very much constrained, both in the compulsive urge to engage in it, and in the underlying themes which are usually quite consistent, providing an overarching environment or context for the changing storylines, like a soap opera (Soffer-Dudek & Somer, 2018). Maladaptive Daydreamers who are trauma survivors may also tend to daydream repeatedly of trauma in different ways (not necessarily their actual trauma), either as victims, rescuers, or perpetrators in dramatic situations (Somer, Abu-Rayya, et al., 2021). For others, MD may revolve around different themes such as an ideal self, being cared for or soothed, or enacting sexual fantasies (Somer, 2002; Wen et al., 2022). Within these overarching themes, every daydream is narrative, creative and different; that is one of the characteristics that enable an MD-informed clinician to make a differential diagnosis between MD and obsessions, ruminations, or post-traumatic flashbacks, which are all characterized by being very fixed and constrained (Christoff et al., 2016). The following excerpt depicts the rich, elaborate, and novel nature of MD fantasies:

I have spun tons of plot lines in this world spanning multiple generations of characters [...] On the negative side, a character's parents or best friend dies, a character is injured, abused, tortured or raped, or even just has a terrible argument with a loved one. On the positive side, a character reunites with a loved one he/she thought was dead, or realizes the person he/she has been in love with for a long time feels the same way, or finds out that she is going to have a baby. Characters fall in love, get married have and raise children, develop deep and strong friendships.

(TAKEN FROM: BIGELSEN & SCHUPAK, 2011, P. 1640)

The phenomenon of MD underscores the inadequacy of the simple distinction between spontaneous and goal-oriented thought. It suggests that we need more fine-grained conceptualizations. In the context of the present work, I hypothesize that the MD dynamic is probably similar to some extent to the workings of the dreaming mind, but with more prefrontal agentive control of the unfolding narrative. The imagery system or dreamlike cognitions of maladaptive daydreamers are probably more salient than they are in many other people. Perhaps, individuals who are engulfed in vivid images are inclined to create stories in their minds. In other words, images probably tend to solicit a unifying storyline: our mind constantly strives to bind the images into a narrative, not unlike the process of narrative making in nocturnal dreams. Indeed, people with high scores on MD reported

higher levels of dream recall, emotional intensity of dreams, nightmare frequency, nightmare distress, recurring nightmares about daytime, lucid dreams, interest toward dreams, problem solving and creative dreams, and dreams affecting daytime mood (Margherita et al., 2023). No effect was observed regarding the emotional tone of dreams. Future research on nocturnal dreams of maladaptive daydreamers and on the neuropsychological correlates of MD may shed light on the similarities and differences between these two related fields.

11 Connection between the disorders supports a common cognitive style

As a final note, it is important to mention that there are significant inter-relations between the three psychopathological domains considered in this paper, namely, OCD, dissociation, and MD. Such inter-relations support the idea of a tendency for a certain cognitive style, manifested in a tendency for dreamlike, pictorial thinking, and reduced sense of agency. First, not surprisingly, MD is strongly related to dissociation with especially large effects for the dissociative subscale of absorption and imaginative involvement (Bigelsen et al., 2016; Ferrante et al., 2022; Jopp et al., 2019; Schimmenti et al., 2020; Soffer-Dudek & Somer, 2022; Somer et al., 2016). Moreover, MD is considered by several scholars to represent a dissociative disorder and to have important links with DID (Ross, 2018; Soffer-Dudek & Somer, 2022). In a sample of people with DID, there were extremely high rates of MD (Ross et al., 2020), and in a sample of people with MD, average dissociation scores were close to the clinical cutoff (Ferrante et al., 2022). In addition to the strong connection between MD and dissociation, there is also a strong connection between MD and OCD. Notably, MD is different than OCD in that it is gratifying in the short run, characterized by reward-seeking—similar to a behavioral addiction—rather than necessarily to threat avoidance. Nevertheless, astoundingly high rates of maladaptive daydreamers have comorbid obsessive-compulsive symptoms or OCD-related spectrum symptoms, including skin-picking, trichotillomania, and body dysmorphic disorder (Salomon-Small et al., 2021; Somer, Soffer-Dudek, & Ross, 2017). Interestingly, intrusive imagery is more salient in OCD with comorbid body dysmorphic disorder than in OCD alone (Nakata et al., 2007). In a sample of over 500 maladaptive daydreamers, approximately 56% of them were over the cutoff for suspected OCD, and dissociation was a strong mediating factor explaining the relationship of OCD and MD (Salomon-Small et al., 2021). Finally, OCD is significantly associated with dissociative experiences, and especially with absorption and imaginative involvement (Soffer-Dudek, 2014, 2017b, 2019, 2023; Soffer-Dudek et al., 2015). All these interconnections support the idea that some individuals may have a hyperactive imagery system, resulting in waking pictorial thinking and thought-image reciprocal associations, predisposing these individuals to certain

types of psychopathologies. More studies are needed on the unique characteristics of nocturnal dreaming in these groups.

12 Conclusion

I have suggested that dreams are characterized by an ever-changing succession of image-thought-image reciprocal momentary hyper-associations, representing meaningful, “top-down” cognitive schemas of the dreamer. I argued that just as abstract or verbal thoughts in dreams are reactions to the dream images, images in dreams are similarly led by, or controlled by, the dreamer’s abstract thoughts, even if that control is not experienced as agentive. I have also maintained that there are individual differences in the extent to which such an oneiric thought dynamic may be present in waking spontaneous thought, which may benefit from more accurate definitions and conceptualizations.

What causes the individual tendency to think in a dreamlike or visual way? Further study is needed to understand whether these stable, trait-like individual differences are innate, or perhaps affected by one’s environment. For example, perhaps a parent may foster a child’s imagination by reading stories to them, or on a larger scale, perhaps a certain culture or language may nurture metaphorical thinking by using symbolic images in common idioms. However, state variables may also affect the nature of an individual’s mental activity. For example, sleep deprivation seems to lead to more dissociative experiences such as absorption and imaginative involvement, depersonalization, derealization and dreamlike thought (Giesbrecht et al., 2007; Selvi et al., 2015; Soffer-Dudek et al., 2017; Van der Kloet et al., 2012; Van Heughten – van der Kloet et al., 2015). More research is needed on the etiological factors explaining this type of cognitive style.

Finally, I suggested that this dreamlike dynamic may predispose individuals to certain psychopathologies. Importantly, this should not be taken to mean that such dreamlike thought is necessarily maladaptive; rather, this argument follows a diathesis-stress model, suggesting that each cognitive style, whether involving imagery or not, predisposes for certain types of psychopathologies in the face of certain stressors. It is also important to keep in mind that the imagery distinction suggested in this paper as a certain type of spontaneous thought is probably also an over-simplification and not specific enough for an accurate classification of people’s thought styles. Specifically, even if we focus on images as driving forces in one’s mental activity, we will notice the differences between the nature of the images and the nature of their power over the individual. For example, individuals may find themselves drawn to intrusive—or alluring—images, as may occur in OCD and MD, respectively. The act of succumbing to engaging with a tempting or interesting image is different from the attempt to repress a distressing image. It is also important to mention that the dreamlike cognitive style is not reserved only for the psychopathologies mentioned above. Examining the imagery salience of a client’s thought pattern is important in the context of other syndromes as well, to

better classify their specific psychopathological profile, for example in depression or anxieties of different kinds, as well as psychosis.

Better understanding imagery-proneness in clinical conditions may bear implications for therapeutic interventions. For example, individuals with a dream-like cognitive style may be better candidates for imaginal exposure interventions than those whose imaginations are less life-like. Moreover, it has been established that individuals who are high in absorption and imaginative involvement are less able to improve in their respective therapies for OCD, depression, and anxiety (e.g., Spitzer et al., 2007). Possibly, imagination-based interventions such as guided imagery or imagery rescripting/rehearsal (Arntz, 2012; Edwards, 2007; Krakow & Zadra, 2010; Smucker, 2005), or similarly, hypnotic memory restructuring (Gravitz, 1994), might prove to benefit them more than a purely verbal cognitive intervention. Indeed, it has been shown that imagery rescripting is useful in OCD, but knowledge is lacking regarding moderating factors that may interfere with, or facilitate, this efficacy (Strachan et al., 2020). In other words, baseline trait tendencies may possibly moderate the effect. Imagery rescripting has also been useful in the context of altering traumatic memories (Morina et al., 2017), and reductions in post-traumatic symptoms were associated with reductions in dissociation (Botelho de Haan et al., 2020). Notably, however, high dissociation tendencies have also been suggested as an exclusion criterion in imagery rescripting for trauma, for fear of uncontrolled dissociating during scripting (Smucker, 2005). Recent research suggests that in cases with high dissociation therapeutic gains with rescripting still exist but might be slower to achieve, because of detached responses to negative affect as well as loss of control over the image (Lechner-Meichsner et al., 2023; Paulik et al., 2022), pointing again to the importance of agency and control. Importantly, the implementation of grounding techniques, when necessary, may enable the dissociative client to safely utilize and benefit from imagery rescripting, which may be a powerful tool for them, by strengthening their awareness and control over their dissociative state (Lechner-Meichsner et al., 2023). Notably, imagery rescripting itself not only utilizes the client's imaginative abilities, but also empowers clients' sense of agency and control as they create their own novel, positive imagery. Various authors have underscored the importance that the imagery modification be the client's personal (agentive) creation (e.g., Krakow & Zadra, 2010; Smucker, 2005). In conclusion, clinicians should ask patients not only about the thoughts that come to their mind, but also about the images that do so.

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