Body Movements During Maladaptive Daydreaming: A Thematic Analysis of Asynchronous Email Interviews[1]

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Abstract: *Objectives*: This study aimed to shed light on the lived experience of stereotypical body movement and gesturing during maladaptive daydreaming (MD). *Method*: Forty-one individuals with probable MD participated in asynchronous in-depth email interviews. *Results*: Four themes describing the movement experience in MD emerged: Need, Variety, Awareness and Agency, and Functions. Conclusion: The analyses revealed two main findings about the bi-directional effect of movement on MD. First, kinesthesia may enhance the daydreamers' experience by deepening their fantasy immersion through improved focus featuring self-hypnotic characteristics. In addition, respondents reported that their body movements enhanced the daydreaming experience by embodying the protagonists' actions. MD-related motions were associated with occasional loss of agency, suggesting unintentional neuromuscular activation.

Keywords: maladaptive daydreaming, kinesthesia, stereotypical movement

Highlights

- Body movement is a central feature in the experience of maladaptive daydreaming (MD)
- During MD, individuals walk, pace, move hands and fingers, rock, mouth, laugh, and cry.
- Some MD-related movements are voluntary and some are experienced without a sense of agency.
- MD-related movement enhances focusing and creates a self-hypnotic immersion.
- MD-related movement intensifies the experience by embodying the protagonists' actions.

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Maladaptive Daydreaming (MD) is a proposed dissociative disorder (Soffer-Dudek & Somer, 2022) characterized by addictive immersions in complex fantastical daydreamed plots, generating intense emotional involvement, often accompanied by stereotypical movements such as pacing, rocking, hand movements, and mouthing (Bigelsen & Schupak, 2011; Somer, 2002; Somer et al., 2017). The construct of immersive and maladaptive daydreaming is related to Wilson and Barber's (1982) concept of fantasy-proneness, a trait found among highly hypnotizable individuals who report lifelong vivid, imaginative involvement, and mystical and religious experiences, together with claims of having particular psychic abilities and out of body experiences (Wilson & Barber, 1981). The common feature of the two constructs is an elevated involvement in fantasy. This gratifying inner absorption becomes maladaptive, consuming many waking hours, when it compromises the accomplishment of daily tasks, hinders the achievement of short- and long-term goals, or generates shame or guilt. In short, immersive daydreaming becomes maladaptive when it interferes with functioning in social, academic, or occupational realms or causes clinically significant distress (Pietkiewicz et al., 2013; Schupak & Rosenthal, 2009; Schimmenti et al., 2019; Soffer-Dudek et al., 2020; Somer, 2002). Soffer-Dudek and Theodore-Katz (2022) found in an Israeli sample that, similar to other internalizing psychiatric syndromes, MD has a point prevalence of 2.5%. Individuals with MD reported spending, on average, 57% of their waking hours on fantasy activity, compared with 16% of the hours for individuals with no MD (Bigelsen et al., 2016).

Like other behavioral addictions, MD features a powerful urge to engage in the behavior, annoyance whenever it is not possible, and repeated unsuccessful efforts to control, cut back, or stop it (Pietkiewicz et al., 2013; Soffer-Dudek et al., 2020). Although it may be employed initially as a way of coping with distress (Somer, 2002), MD has been often associated with elevated psychopathology (Somer et al., 2017) and next-day negative emotions (Soffer-Dudek & Somer, 2018; Wen et al., 2021). Regrettably, many

mental health practitioners misdiagnose MD or minimize the problem, resulting in suboptimal treatment and heightened loneliness and distress (Bigelsen & Schupak, 2011).

MD and dissociative phenomena share common phenomenological characteristics, including double consciousness, vivid sensory imagery, and the activity of internally narrated characters. The protagonists in MD are occasionally experienced as having independent agency, but unlike the identities in dissociative identity disorder (DID) these imaginary personae typically do not take control of the individual's behavior. Soffer-Dudek and Somer (2022) concluded that high dissociative absorption is a common risk factor shared by several dissociative disorders, such as depersonalization/derealization disorder, DID, and MD. Similar to individuals with dissociative disorders, many persons with MD report that their earliest experiences of MD began during childhood, independently of childhood trauma (Somer et al., 2016a), implying an innate predisposition to absorptive immersion in fantasy (Schimmenti et al., 2019). The trait that enables a convincing sense of presence in fantasy also can facilitate mental escape from childhood adversities (Ross et al., 2020) and their memories (Abu-Rayya et al., 2020), or a painful current reality (Somer et al., 2019). MD is highly comorbid with attention deficit hyperactivity disorder, obsessive-compulsive and related disorders, anxiety disorders, and depression (Somer et al., 2017), and is associated with high rates of suicidality (Soffer-Dudek & Somer, 2018). The suffering associated with this form of mental activity has led to multiple online forums dedicated to MD. One of them, on Reddit, serves over 102,000 participants (Retrieved from https://www.reddit.com/r/MaladaptiveDreaming/ on August 17, 2023).

One of the sources of misdiagnosis of MD is the concomitant feature of kinesthesia (Somer et al., 2016). For example, many children who display repetitive movements are diagnosed with a stereotypical movement disorder or autism spectrum disorder. These children often report engaging in enjoyable daydreaming as they engage in physical movements (Freeman et al., 2010; West et al., 2021). Adults with MD tend to seek privacy when daydreaming to avoid scrutiny and ridicule (Somer et al., 2016a) in response to their facial and body movements. Indeed, physical activity during MD is consistently reported in the literature (Somer et al., 2016b). In fact, two items describing body gestures and movement were included in the 16-item Maladaptive Daydreaming Scale (MDS-16, Somer et al., 2017). Items 3 and 14 of the MDS-16 ask, respectively: "How often are your current daydreams accompanied by vocal noises or facial expressions (e. g., laughing, talking, or mouthing the words)?" and "How often are your current daydreams accompanied by physical activity such as pacing, swinging, or shaking your hands?." Still, the role and meaning of body movement in the experience of people who engage in immersive and maladaptive fantasies are not yet understood. This qualitative inquiry aims to shed light on the lived experience of stereotypical body movement and gesturing during MD.

Method

Participants

A call for English-speaking participants aged 18 or older was sent out to 200 individuals who self-identified as coping with MD and had previously written to the author indicating their interest in MD research. Fifty-two respondents expressed interest in the research topic and received informed consent forms with a detailed study description. We emailed these individuals the 16-item Maladaptive Daydreaming Scale. Forty-one respondents with a mean MDS-16 score ≥ 40, the cutoff mean score indicative of probable MD (Soffer-Dudek, 2021), were invited to partake in an asynchronous email interview study.

According to Patton (2002), to maximize the use of limited resources, qualitative research should use purposeful sampling to select cases with the most information on a topic of interest. To this end, the author interviewed 41 consenting individuals at least 18

years old who met the MDS-16 criterion for probable MD and agreed to share their thoughts about physical movement during MD. This purposeful homogeneous sample promised to offer a deeper insight into the topic of interest. Participants in this study came from five continents: Asia (13), North America (11), Europe (8), South America (6), and Africa (3). Eleven participants were male, the others female. Their mean age was 31.3 (*SD* = 10.3), ranging from 18 to 62. Thirty-one respondents indicated their marital status as single; three were divorced, one was a widow, and six were married or in a relationship. Nine participants had a high school degree, some college education, or a diploma; 17 had completed a Bachelor's degree or were graduate students; 10 had a Master's degree, and 5 respondents had completed their doctoral-level education. Twenty-two individuals were employed, and one was retired. The rest were unemployed. The mean MDS-16 score of the sample was 61.4 (*SD* = 12.4), range: 40 - 99. In sum, this is a culturally diverse sample. The typical respondent was a well-educated, unmarried female in her thirties with an MD score well above the clinical cutoff score of 40. This sample was characterized by a 46% unemployment rate, perhaps reflecting the impairment of functioning associated with MD.

Measure

The *Maladaptive Daydreaming Scale-16* (MDS-16; Somer et al., 2017). is a self-report measure commonly used in MD research. It has 11 points on a scale ranging from 0% (never, no distress) to 100% (extreme distress, extremely frequent). The scale includes four factors: a yearning to engage in daydreaming, impaired functioning, an urge for physical movements (kinesthesia), and listening to music (Soffer-Dudek et al., 2020). It has been validated as a reliable measure in several languages (e. g., Jopp et al., 2018; Pietkiewicz et al., 2023; Sándor et al., 2020).

Interview Process

Email interviewing is a relatively new research method that offers excellent potential for qualitative researchers (Hawkins, 2018). The two main email interview categories are asynchronous and synchronous (Gibson, 2017). In asynchronous interviews, respondents can receive questions by email or video, which they can reply to at their convenience. In synchronous interviews, the interviewer and interviewee are online simultaneously and questions are posed sequentially in real-time (Gibson, 2017). Asynchronous email interviews can take place over various time intervals (hours, days, weeks, or months) and offer more flexibility than synchronous email approaches (Golding, 2014). It is for this and other reasons that we employed this research method. The merit of asynchronous email interviews for health research has been discussed in the literature (e. g., Amri et al., 2021), including optimization of anonymity, relief from time pressure, and the opportunity to think carefully the wording of each response.

Participation in this study was voluntary as no compensation was offered to respondents. The author emailed the interview questions to consenting participants and requested that they try to respond within 48 hours. If no response was received within 72 hours, I sent a reminder. The research interview followed a pre-prepared interview guide but occasionally diverged from it to explore spontaneously shared information or seek clarification. The interview guide included the following general issues that were presented as more specific inquiries, followed up by further requests for clarification or elaboration:

- Tell me what your body does when you daydream.
- Describe the experience of what your body does.
- How does your movement affect your daydreaming?
- How does your daydreaming affect your movement?
- What is the meaning of your body movement?
- How would it affect your experience if you were motionless during daydreaming?
- Tell me about your sense of control over your body and mind when daydreaming.
- What were people's reactions to your physical movement during daydreaming?

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Cooperation was excellent, and particular questions were rarely left unanswered. Each of the 41 respondents received an average of five emails, each containing about five questions, totaling about 1,025 questions asked and answered, showing excellent cooperation. Only two of the requests for information were disregarded by two individuals, with a negligible missing data ratio of less than .002% and no obvious pattern of missingness.

Numbers substituted respondents' names. Answers were copied from the email messages without the corresponding names and email addresses. The responses were then marked with the respective identifying number and compiled by question. All identifying details were removed from the answers to preserve anonymity. The University of Haifa Faculty of Social Welfare and Health Studies Ethics Committee approved the study (Certificate 407/22).

Data Analysis

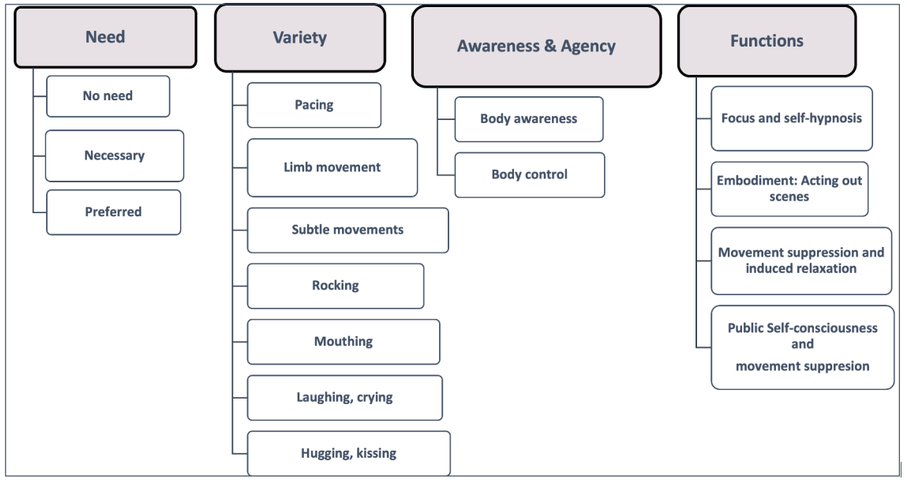
The data were submitted to an inductive thematic analysis (Braun & Clarke, 2006) that included the compilation of email interview responses and followed coding stages. Initially, the author read and re-read the email responses to identify potential themes. The second analysis level involved reviewing these initial codes with a research assistant. We focused on retaining the initial codes' range while producing sub-themes. The analysis of the data was informed by the research question: What is the lived experience and function of movement during MD? In the third analysis stage, the author identified quotes congruent with the identified themes and then defined the themes and sub-themes after reviewing them.

Results

The analysis produced four themes describing the movement experience in MD: Need, Variety, Awareness and Agency and, Functions. These four themes were further divided into sub-themes, as shown in Figure 1. The quoted respondents are identified with numerical codes.

Figure 1

Themes and Subthemes of the Experience of Movement in Maladaptive Daydreaming



Need for Movement in MD

Physical movements served essential functions in the daydreaming experience of most. Although many respondents utilized movement to enhance their daydreaming, smaller groups either could not generate any fantasies without movement or required no physical activity to trigger or maintain their daydreaming.

No Need

About 10% of the sample indicated not needing movement to activate and sustain the daydreaming (because the themes are based on open verbal reports, the

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numerical summaries may not be exhaustive as they are based on provided responses. The reported frequencies may also add up to more than 100% because some respondents reported more than one theme in a category). For example: "I don't believe movement significantly influences my daydreaming. I can start daydreaming while walking, but the two are not inter-connected. I daydream without movement all the time" (30); "MD can intrude in my life even when I am still. It begins the moment that I wake up in the morning. While in bed, I can daydream for hours with little movement" (38). Respondent 16 indicated an advantage to motionless daydreaming: "I don't have any associated movement. Not at all. Fortunately. That allows me to daydream in public." But this subgroup was the exception. For most respondents, kinesthesia was essential in their daydreaming experience, and their stories comprise the rest of this research article.

Movement Is Necessary

About 8% of the respondents indicated that they could not daydream unless they moved. For example, respondent 12 categorically determined that moving and vocalizing during MD is a requisite: "Daydreaming while not moving or making sounds? I've tried. That's impossible. It didn't work." For her, daydreaming is simply impossible without the involvement of her body. A similar reaction: “I have noticed that I cannot daydream freely and comfortably when not moving… I do not understand why, but I just cannot. If I sit idly, I may daydream for a few minutes, but then I would have to get up and start walking” (40).

Movement Is Preferred

Eighty-two percent of respondents talked about their preference for movement because of its beneficial effect on the daydreaming experience. Here is one explanation: "It seems that sitting down while daydreaming is impossible. The more movements I make, the more I get immersed in that inner world…When I am still, the immersion is limited, and so is the pleasure (15)." This respondent connects the intensity and pleasure of the fantasy and her movements. Here is another example: "I don't need movement to daydream, but my daydreams are only vivid if I spin in circles. If I'm still…I can daydream, but it's not realistic at all." (41).

The results suggest that MD-related motions serve at least two roles: intensifying focused attention on the unfolding fantasy and vitalizing the daydreaming experience by the embodiment of the imagined scenes. The role of MD motion was also inferred from cases of subdued movement when expansive gesturing is disadvantageous. Such motion accompanied calmer storylines and induced relaxation. This outcome may be instrumental in public because fewer attention resources are dedicated to the less compelling daydreams allowing for better monitoring of body behavior and onlooker reactions. Many respondents provided similar accounts of public self-consciousness resulting in MD immobility. Noticeably, complete stillness was difficult for most. Here are a few examples: “While traveling on a train, I can't act out my daydreams, so with the help of subtle changes in facial expression but no body movement, I can still daydream, although not as freely as I would like to.” (17); “If I have to be still, like when sitting on an airplane, I'll move only my eyes or lips. It is possible, but it requires a particular sedentary ‘scene set.’ Not very fun.” (12); “My brain has a subconscious ‘sixth sense’ that evaluates if others can see me…if I am with people, but I face the wall, I might move my facial muscles while daydreaming, but not the rest of my body.” (29).

In short, although some participants can daydream motionless, most choose movement because of its intensifying effect on MD. When presenting the theme describing MD's functions, I will elaborate on this issue. Respondents reported a wide range of MD-related movements. The following theme describes the plethora of motions and gestures displayed during MD.

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Variety of Movement in MD

Stereotypical movements are manifested in several psychiatric disorders, such as tic (Udea & Black, 2021), stereotypical movement (Freeman et al., 2010), and autism spectrum (Singer, 2011) disorders. Maladaptive daydreaming also features kinesthesia as a typical behavioral feature (Somer et al., 2016). Our respondents described several categories of body motion employed. The most prominent of them were pacing and walking.

Pacing and Walking

This type of kinesthetics is often reported on the Internet by MD sufferers (Somer et al., 2016b) and was described by 23 (51%) respondents in this study. For example, participant 4 recounted, "I always like to move, and while daydreaming, I like to walk. I walk continuously for hours and hours while daydreaming without any pain, irritation, or discomfort to my body." Participant 14 wrote: "Regarding repetitive movement, I pace around (most persistent movement) and mess with my hair (touching it constantly). I also carry my phone in my hand with me all the time as I pace around while changing the music volume constantly." Several respondents stated that pacing had characterized their daydreaming since its onset in childhood.

> When I started maladaptive daydreaming (around 12), I would pace in a circle in my room and talk to myself out loud. I daydreamed about having conversations with my friends as in real life, I was too shy and quiet and was quite a lonely girl. As a grown-up, I still prefer to pace in my room and fantasize about social life (35).

As is evident in theme 3, movement can facilitate the onset of an MD episode and boost its vividness. However, since movement can also draw unwanted attention to the daydreamer, walking could be the most inconspicuous form of movement safely employed. This issue will be discussed later in the sub-theme titled "Movement suppression during public self-consciousness."

Limb Movement

Eleven (27%) respondents reported a variety of limb movements: "The movements involve pacing, skipping, jumping, running, dancing, arms swaying, clenching fists, going around in circles, reaching for things, and pushing down on something (21); "When I daydream, I am swaying, jumping, jogging in place, pacing, or dancing. It helps me feel the movement in my daydream (20). Many such reports imply that movement is the physical engine that energizes the imagination. Conversely, five respondents indicated that the causal direction is the opposite. Here is what participant 36 said:

> The only thing I do is shake my leg since it soothes me. I cannot be completely still while daydreaming because my leg usually begins to shake. It feels like I have much energy inside my body, so the only way out is to shake my leg.

The interlocutor begins by describing the leg shake as instrumental in inducing calmness. But immediately afterward, he describes the leg movement as an outcome, not a cause. He explains that the leg shake is an involuntary result of the built-up tension associated with the daydream. A similar directionality is implied by respondent 38:

> I find myself making real-life hand gestures when daydreaming. These gestures may include pointing at objects where they may be in my daydreams. I feel tempted to begin pacing during an MD episode. Resisting them requires effort and feels unnatural.

She does not gesture. She "finds herself" making gestures and struggles to resist her body movements. These quotes do not offer unequivocal clarity about the role of

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movement, a question I shall explore further in themes 3 (Awareness and Agency) and 4 (MD functions). The interviews with members of this sample revealed a diversity of other physical and emotional gestures:

Rocking

"I love daydreaming in the rocking chair!! The rocking chair is fundamental in my culture. Babies and kids are raised in them, so I guess it brings an extra comforting context." (12); "I sit on my bed and rock back and forth as I daydream. The rocking sets me in the zone, it's as if it takes away to the other reality." (2). Quotes like these were shared by three individuals and suggest that stereotypical movement might be instrumental in creating a relaxed alteration of the mental state.

Subtle Movements

Three respondents reported more imperceptible motion "Where I'm not alone, I think there are little movements I might act out, like twisting around in my office swivel/ spinning chair, tapping my foot, and twirling my hair." (9); "While I'm at work or just around other people in general, I have to stay still even if my mind goes to a daydream. In such a case, I find myself still rocking my foot or swaying back and forth slightly." (20). Other data suggests that the movement is not only a facilitator of the daydreaming state but can also reflect the behavior and emotions of the protagonist in the daydream. Below are subthemes that represent these properties.

Mouthing

Three participants reported mouthing words: "I almost never move my body. Usually, I sit or lay down. I sometimes mouth my dialogues or speak them loudly when I'm home alone." (28); "I move my mouth, but I don't open it. I think to the outside world, I look like I have tics or I'm slightly crazy." (10); "I mouth along (without actually vocalizing anything) to what I'm saying in my daydream." (3).

Laughing/Crying

Here are quotes from 2 participants who tend to physically express their daydreamed emotions: "I often daydream funny scenarios and would be so immersed that I would silently laugh until my throat or stomach hurts. I would also mutter to myself and make expressions." (9); "I am crying as a tragic scene plays out." (10).

Hugging/Kissing

Acting out romantic gestures was mentioned by two participants: "When I daydream, I move all the time, I act, I talk, and I even pretend I am hugging someone…(18); "I am less restricted when I am alone and find myself engaging in hugging motions and other actual movements to complement my daydreaming (such as lip movements of kissing)." (8). In their accounts of the bidirectional relation between MD and kinesthesia, respondents have also identified changes in their body awareness and sense of agency.

Awareness and the Sense of Agency in MD

Body Awareness

"The movements are independent of me. My theory is that because I frequently don't realize I'm daydreaming, my body responds as if it was real. Therefore, if my character talks in my daydream, well, I'm actually going to talk…When I have intrusive daydreams, I move more." (11). This person describes a complete dissociation from her body that seems activated by a separate source of volition: the protagonist in her daydream. Participant 12 described changes in body awareness during MD:

> I move my body…but I'm not sure exactly what movements I do. I tried to realize what I do while daydreaming, but as long as I'm paying attention to my body, it's impossible to daydream. After some attempts, I gave up. I concluded that to daydream vividly, I need to forget my body. And this is when I suffer accidents when I'm no longer aware of what my body is doing in my bedroom.

She has a general awareness of her body during MD. However, focusing inwardly on her fantasy is incompatible with monitoring her body, and body awareness precludes MD. Because she prefers MD, she must ignore her body. This automatization seems unsafe and also implies a reduced sense of agency.

Participant 14 reported a similarly delayed awareness: "The urge to pace around pulls me out of bed. Sometimes when I have already got up to start pacing, I am not even aware that I got up in the first place. It is like going into another dimension for a few moments. Rarely, when I become aware, can I snap out of it." It is not *she* that gets out of bed. Without much awareness, "The urge to pace" pulls her out of bed, leaving her incapable of controlling the situation.

Sense of Agency

Body unawareness during MD was reported by participant 6: "I don't think I am always aware I am doing it. After filling in the first questionnaire today, I became more aware of the movements and how frequently I engage in them." The compromised body awareness during MD is sometimes associated with a reduced sense of agency, as well. As participant 29 says: "Pacing, facial expressions, swinging torso back and forth are induced when I daydream. This isn't a conscious decision; often I only notice that I'm moving when I break out of the daydream." The interlocutor describes an "induced" movement and delayed awareness of her kinesthesia. Not only does she not feel she initiated the movement, but she also becomes aware of it only after emerging from her daydreaming state.

The Function of Movement in MD

Respondents spontaneously described two main functions associated with their kinesthesia: Enhancing the focus and attention on the unfolding MD storyline and reifying MD scenes by acting them out. A third theme emerged from probing questions about the effect of suppressed movement on MD.

Enhanced Focus and Self-Hypnosis

Eight respondents (20%) very explicitly described the role of their movements in focusing their attention inwardly. For example, "Movement helps me focus on my daydreaming and feel more [*sic*] they are more realistic." (26). Respondent 4 tried to daydream while sitting still, but the result was disappointing. He said:

> If I daydream while being idle, I may daydream for a few minutes, but then I would have to get up and start walking. I guess it's because I lack concentration and focus, and walking somehow triggers my focus and attention to my imagination without being bothered by external factors.

Participant 37 described walking as directly affecting the realness of the daydream, in general, and the vividness of associated feelings.

> …if I don't pace, it feels like I can't feel the genuine feeling in my daydream. Sometimes, the movement happens automatically, so if I try to stop moving, the vivid feeling in my daydream will stop, and that's very annoying…the only time I can be still while daydreaming is when I try to sleep.

Movement and MD are concurrent and intertwined. Stopping dulls the emotional vividness immediately and is willfully employed only to allow daydreaming to induce sleep. See the subtheme titled "Movement suppression for induced relaxation" below for an elaboration on the theme of movement suppression in the service of relaxation and sleepiness.

Six respondents assigned a hypnotic quality to the experience of stereotypical movement. For instance: "I can daydream without the pacing; however, the movement immerses me further into the daydream, and it feels as if I am in some trance that is difficult to come out of." (33) The depth of the immersion instigated by the movement is portrayed as producing involuntariness and an altered state of consciousness resembling a hypnotic state. Interlocutor 16 described the employment of eye fixation, a known hypnosis induction technique (Cardeña et al., 2017).

> If I lay [sic] down, I look at one fixed point to make the experience of talking with someone or moving in my daydream more real. But that's totally voluntary. Like a plus. Most of the time, I daydream, staying still.

The ultimate aim of self-hypnosis here is to facilitate a fully immersed fantasy experience. Self-induced altered states of consciousness are enhanced by embodying the daydreamed chatter and behaviors with corresponding muscular activity to create the ultimate virtual reality experience.

Embodiment: Acting Out Scenes

The fantasy enactment in MD is eloquently described in the following excerpts:

> "I constantly do the movements that correspond to the scene in my daydreaming. If I'm at a party, I dance. If I'm drinking something, I do the movement of drinking with anything that looks like a bottle, a glass... When I was much younger, I would get into my dad's car while it was parked in the garage, sit in the driver's seat, and drive through the streets of my city, meeting people and waving from the car while listening to music." (35)

> The movement is a mirror to the movement that I am doing in the daydream. For example: if I am daydreaming about myself running and opening a door, I act out in the physical world as If I am actually there. I have gotten physically hurt a couple of times when I daydream about battle scenes because of this - I have injured my feet and legs several times. (14)

These qualitative data align with findings from quantitative research that demonstrated that proprioceptive input, for instance, posture (Cuddy et al., 2018), gestures (Cacioppo et al., 1993), and facial expressions, such as smiling or pouting, (Duclos & Laird, 2001) can influence affective responses. Furthermore, Van Geest et al. (2021) reported results from a study showing that a specific movement sequence based on movement elements associated with a particular emotion executed with a dance movement therapist can significantly enhance the corresponding affective state. In other words, some individuals with MD generate the "emotional score" of their fantasy and intensify it by performing in vivo the daydreamed action.

The themes of Enhanced focus and self-hypnosis and the Acting out scenes fit well with the bidirectional sensory-cortical embodiment model presented in Figure 2 above. The reported synchronized movement produces afferent neural stimulation. These bottom-up stimuli deepen the daydream experience by intensifying both the affect and the bodily experience. Participant 8 described the experience: "With a kissing daydream, I press the thumb and forefinger together to create a parallel sensation. The fingers are nimble enough to enhance the romance and sensuality of the experience." With his fingers, he intentionally recreates the physical likeness of lips, so that when

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simultaneously kissing a woman in his daydream and his fingers he generates a realistic multi-sensory stimulation that mimics the thrill of an actual sensual experience.

Movement Suppression for Induced Relaxation

In an attempt to perform a deviant case analysis (Patton, 2002), I searched for quotes that contradicted the importance of movement in MD or even showed a preference for immobility during MD. Specifically, I analyzed responses to my probes about the effect of stillness in daydreaming and my grand tour question: "How would it affect your experience if you were motionless during daydreaming?" The theme Need for movement ,already included a sub-theme of data associated with No need for MD-related movement. To supplement the data on MD motionlessness, I present evidence about the effects of MD-related movement suppression.

Five respondents spontaneously indicated that subduing the urge to move during MD induced a sense of relaxation appropriate for bedtime and conducive to sleep. For example: "It [being still] is relaxing and helps me to cope with social anxiety if it happens in public. If I daydream while lying in bed, it helps me fall asleep. The physically more passive daydreams are not as exhausting as the active ones." (21)

The respondent describes how moderating his MD-related movements in public reduces his concerns about how others perceive him. He also explains how toned-down MD kinesthetics changes the energy in his daydreams and eases the process of falling asleep. Participant 14 exemplifies the cyclical embodiment model of kinesthesia in MD (see Figure 2).

> I daydream without movement when I am about to fall asleep. The type of daydream that I have when I am lying down tends to be very intimate and soft - I avoid fast and gory daydream themes when I do this because those make me want to get up and pace. I believe it might be due to the contact of my skin with something like my bed, pillow, or sheets. It is easier to pretend that someone is there with me. Those are the only times when I can daydream while being still. It feels like a highly protective environment and an even more immersive daydream.

She daydreams herself to sleep by creating a facsimile of an intimate bed scene. First, she deliberately suppresses vigorous body motions incompatible with the desired scene and the ensuant sleepiness (efferent stimulation from the sensorimotor cortex). She then incorporates the tactile stimulation of her soft bed linen into her fantasy (afferent sensory stimulation to the brain), resulting in a highly immersive but calm daydream experience.

The deviant case analysis of the data on movement suppression during bedtime supported the notion that the body plays a crucial role in MD even when its movements are restricted. This notion was further substantiated in MD situations where public self-consciousness precluded conspicuous actions.

Movement Suppression During Public Self-Consciousness

The bi-directional nature of physical activity in MD was evident in my respondents' reports on movement inhibition in public. For example: "I force myself not to move when I daydream in public; it relaxes and helps me cope with social anxiety. If I daydream while lying in bed, it helps me fall asleep." (21) It is unclear if this participant's movement restriction serves as an anxiolytic or if it eases her public self-consciousness about being "discovered." The following quote suggests that movement restrictions in MD can compromise the quality of the experience by forcing duller and less immersive daydreams:

> The less movement I do, the less vivid the daydream and the easier it is for me to get taken out of the daydream...at night, when my daydreams are rarely intense, not moving much doesn't seem to inhibit my daydreams. I find that daydreaming

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without moving results in less vivid daydreams involving much less movement or action. When I stay still, there is less movement from the characters. (29)

Discussion

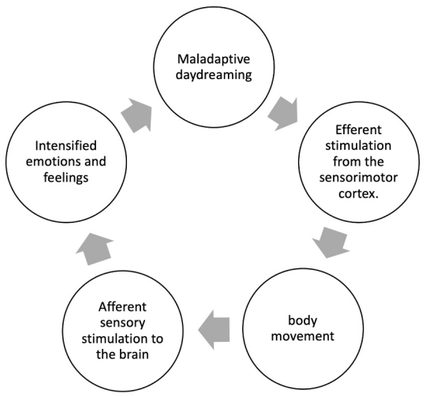
This sample engaged in a wide variety of intense MD-related physical actions, such as mouthing, pacing, and other stereotypical limb movements, as well as emotionally expressive actions like laughing, crying, hugging, and kissing. The intense expressiveness associated with MD is an indispensable element of the experience. While absorbed in their inner worlds of fantasy, my respondents exhibited the physical representations of the daydreamed actions. However, respondents were mindful of their dramatic body language and how onlookers might perceive it and resorted to employing more covert forms of body activation.

The sub-themes on movement suppression provided a more detailed description of the circumstances and consequences of movement suppression. By and large, movement during MD reflected the contents of their experienced fantasy. A similar process was demonstrated in sleep-related dreaming. Dresler et al. (2011) used polysomnography during lucid dreaming to circumvent the lack of conscious awareness during sleep. They showed that a predefined motor task in a dream elicited neuronal activation in the sensorimotor cortex. In other words, the authors demonstrated that specific content of REM-associated dreaming could be visualized by neuroimaging, which aligns with the assumption that motor imagery activation patterns largely overlap with motor execution activity (Jeannerod, 2006). It is conceivable that immersive daydreaming, with its intense sensory-emotional characteristics, generates similar concurrent activation in the sensorimotor cortex. However, unlike sleep-related dreaming associated with REM sleep paralysis (Mainieri et al., 2021), MD does not occur during sleep. Hence, the intense and often irresistible urges to move in synch with the unfolding daydream story.

About 65% of the sample spontaneously indicated that they experienced a complete sense of agency over their MD movement and suggested an opposite direction of causality, namely that movement facilitated their daydreaming. Embodiment theories can help explain this opposite MD-movement causality link. Body and movement are considered vital elements of thinking, feeling, perception, and action in embodiment theories and research (Winkielman et al., 2015). According to an embodiment model of MD (see Figure 2), the body's sensations and movements contribute to subjective experiences such as vivid daydreams (Neumann & Strack, 2000). In accordance with the James-Lange theory (1922), this movement behavior also influences our emotional experience through kinesthetic body feedback (Koch et al., 2014). The body receives and supplies sensory data to the brain through the central nervous system, which forms neural patterns. As a result, they contribute to the experience of emotions and feelings (Bechara and Damasio, 2005).

Figure 2

An Embodiment Model of Movement in Maladaptive Daydreaming



The data presented in this paper suggest that body awareness and the sense of agency during MD-related kinesthetics can be compromised while attention is focused on the unfolding fantasy storyline. Based on work in the cognitive neuroscience of action awareness and motor control, Evans et al. (2015) conducted experiments introducing spatiotemporal conflicts between cortical motor signals and their resultant sensory consequences during real-time brain control of a visual cursor. Their two experiments associated congruent brain-machine interfaces with a robust sense of agency. The sense of agency was undermined when the researchers introduced neuro-visual delay, and the curser responded to movement commands in a belated mode. They concluded that bodily and brain-machine interface actions rely on common mechanisms of sensorimotor integration for agency judgments. Future neuroscience research should examine whether body movement unawareness in MD is also associated with perturbed proprioceptive feedback. Disturbed proprioceptive feedback in MD could impair the sense of agency in body movement. Because kinesthetics in MD is also intentional in many cases, I was curious how respondents understood its role.

To add rigor to this qualitative inquiry and explore the full range of the investigated phenomenon, I presented a negative case analysis (McPherson & Thorne, 2006) by identifying outliers and discussing data that might contradict the emerging salience of movement in MD. The subtheme titled *No Need* presents explicit examples of individuals who do not need to move during MD. That part of the manuscript provided data on the outcome of suppressing the urge to move in circumstances where inconspicuousness is preferable. It seems that kinesthetics plays a crucial role in MD even when curbed. We learn about the stimulating effect of movement by examining the impact of its suppression. When invigoration is not wanted, such as before sleep, immobility facilitates calmer fantasy storylines and a more subdued physical state. In situations where noticeability is undesirable, observable actions are restricted. The prominent role of movement in MD becomes evident also by examining negative cases. Daydreamers report that Inhibited motion induces tranquility and calmer fantasy scenes, favorable for bedtime daydreaming. When daydreaming in public, there is a conscious effort to conceal observable movement. Still, complete inaction seems complicated, as the daydreamers resort to more subtle gesticulations to animate their inner experience.

Clinical Implications

These results build on existing evidence that movement is common in MD as a significant number of participants identified body movement as a prominent feature associated with maladaptive daydreaming. This observation suggests that kinesthetic experiences may be a relevant factor to consider in understanding MD. Although adults are better at concealing the telling movements, these results should be considered in pediatric psycho-neurology clinics. Stereotypical movements in children could also be symptomatic indicators of potential MD (Freeman et al., 2010; Robinson et al., 2016).

The evidence suggests that some individuals with MD might control their fantasies by curbing their concomitant movements. One possible implication of this finding pertains to the employment of movement suppression in the treatment protocol for MD. Future research could shed light on the impact of body movement control on the recovery from MD.

The findings of this study have to be seen in light of some limitations. First, although the presented data provide a detailed description of the investigated phenomenon, the findings cannot be extended to the broader population of individuals suffering from MD, and its generalizability is limited. Though only future research can shed light on how individuals with MD who do not move while daydreaming differ from the current sample, evidence shows that 79% of individuals with MD report daydreaming-related kinesthesia (Bigelsen & Schupak, 2011). In other words, the present findings offer new inductive notions

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on the possible roles movement plays in MD that should be the basis of hypothesis formulations for future deductive research.

The sample size in this study was modest compared to the standard in quantitative studies, adding a further challenge to the universality of the findings (Vasileiou et al., 2018). However, achieving data saturation, not statistical significance, is the prevailing principle in designing qualitative research. Theoretical saturation, as achieved in the current investigation of 41 interviewees, often occurs in homogeneous samples as small as 12 (Boddy, 2016). The following research step should involve replication studies and larger-scale hypothesis-driven studies on the function movement in MD.

The methodology in the current study necessitated continuous, direct contact with the interviewees. My involvement with them may have consciously or subconsciously affected their responses and my interpretation of the data. Respondents may have selectively provided answers they believed I, an MD researcher, might have expected to hear. It is also conceivable that my a-priori expectations might have biased my selection of data to be presented. To enhance the credibility of the presented findings, I kept meticulous records of my data and decision trails and discussed them with my research team and peers. Nevertheless, future research should strive to validate the bi-directional embodiment model of MD movement, presented in this paper, with more objective experience sampling and brain imaging studies.

Multiple in-depth interviews with individuals struggling with MD had two main findings about the function of movement during daydreaming. First, MD-related kinesthetics might enhance the daydreamers' experience by deepening their fantasy immersion through improved focus featuring self-hypnotic characteristics. Second, respondents reported that their body movements intensified the daydreaming experience by embodying the protagonists' actions. Occasional loss of the sense of agency suggests a bi-directional feedback process in which afferent-efferent neuro-sensory processes might be activated during MD.

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Körperbewegungen Während des Maladaptiven Tagträumens: Eine Thematische Analyse von Asynchronen E-Mail-Interviews

Eli Somer

Zusammenfassung: *Zielsetzung*: Ziel dieser Studie war es, die gelebte Erfahrung stereotyper Körperbewegungen und Gesten während maladaptiven Tagträumens (MD) zu beleuchten. *Methode*: Einundvierzig Personen mit wahrscheinlicher MD nahmen an asynchronen, ausführlichen E-Mail-Interviews teil. *Ergebnisse*: Es ergaben sich vier Themen, die das Bewegungserlebnis bei MD beschreiben: Bedürfnis, Vielfalt, Bewusstheit und Handlungsfähigkeit sowie Funktionen. Die Analyse ergab zwei wesentliche Erkenntnisse über die bidirektionale Wirkung von Bewegung auf MD. Erstens könnte Kinästhesie die Erfahrung der Tagträumer verbessern, indem sie die Vertiefung ihrer Fantasie durch eine verbesserte Konzentration mit selbsthypnotischen Eigenschaften fördert. Darüber hinaus berichteten die Befragten, dass ihre Körperbewegungen das Tagtraumerlebnis verstärkten, indem sie die Handlungen der Protagonisten verkörperten. MD-bezogene Bewegungen waren mit einem gelegentlichen Verlust der Handlungsfähigkeit verbunden, was auf eine unbeabsichtigte neuromuskuläre Aktivierung hindeutet.

German translation: Eberhard Bauer

Movimentos Corporais Durante "Devaneios Excessivos" (*Maladaptive Daydreaming*): Uma Análise Temática de Entrevistas Assíncronas por e-mail

Eli Somer

Resumo. *Objetivos*: Este estudo teve como objetivo lançar luz sobre a experiência vivida de movimentos corporais estereotipados e gestos durante os chamados "devaneios excessivos" (*Maladaptive Daydreaming* - MD). *Método*: Quarenta e um indivíduos com provável MD participaram de entrevistas assíncronas aprofundadas, por e-mail. *Resultados*: Surgiram quatro temas que descrevem a experiência de movimento na MD: Necessidade, Variedade, Consciência e Agência, e Funções. A análise revelou duas conclusões principais sobre o efeito bidirecional do movimento no MD. Primeiro, a cinestesia pode ampliar a experiência dos indivíduos, aprofundando a imersão na fantasia por meio de um foco aumentado com características auto-hipnóticas. Além disso, os entrevistados relataram que seus movimentos corporais melhoraram a experiência com os devaneios ao incorporar as ações dos protagonistas. Os movimentos relacionados ao MD foram associados à perda ocasional de agência, sugerindo ativação neuromuscular não intencional.

Portuguese translation: Antônio Lima

Movimientos Corporales Durante la Ensoñación Desadaptativa: Un Análisis Temático de Entrevistas Asíncronas por Correo Electrónico

Eli Somer

Resumen. *Objetivos*: Este estudio investigó la experiencia del movimiento corporal estereotipado y la gesticulación durante la ensoñación desadaptativa (*maladaptive daydreaming* o MD). *Método*: Cuarenta y un individuos con probable MD participaron en entrevistas asíncronas en profundidad por correo electrónico. *Resultados*: Surgieron cuatro temas para describir la experiencia de movimiento en MD: Necesidad, Variedad, Consciencia y Agencia, y Funciones. *Conclusión*: Los resultado arrojan dos conclusiones principales sobre el efecto bidireccional del movimiento en la MD. En primer lugar, la cinestesia puede mejorar la experiencia de los soñadores despiertos al profundizar su inmersión en la fantasía a través de una mayor concentración con características autohipnóticas. Además, los encuestados afirmaron que los movimientos de su cuerpo mejoraban la experiencia de soñar despiertos al encarnar las acciones de los protagonistas. Los movimientos relacionados con la MD se asociaron con la pérdida ocasional de agencia, lo que sugiere una activación neuromuscular involuntaria.

Spanish translation: Etzel Cardeña