Maladaptive daydreaming: Evidence for an under-researched mental health disorder

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A R T I C L E   I N F O

A B S T R A C T

This study explores the recently described phenomenon of Maladaptive Daydreaming (MD) and attempts to enhance the understanding of its features. It documents the experiences of 340 self-identified maladaptive daydreamers who spend excessive amounts of time engaged in mental fantasy worlds, in comparison to 107 controls. Our sample included a total of 447 individuals, aged 13–78, from 45 countries who responded to online announcements. Participants answered quantitative and qualitative questions about their daydreaming habits and completed seven questionnaires assessing mental health symptoms. Findings demonstrated that MD differs significantly from normative daydreaming in terms of quantity, content, experience, controllability, distress, and interference with life functioning. Results also demonstrated that Maladaptive Daydreamers endorsed significantly higher rates of attention deficit, obsessive compulsive and dissociation symptoms than controls. In sum, findings suggested that MD represents an under-acknowledged clinical phenomenon that causes distress, hinders life functioning and requires more scientific and clinical attention.

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1. Introduction

"I have 35 distinct characters in my daydreams. They have been with me since childhood. I cannot remember a time when my mind was alone, with just myself. They have always been there. All of my daydreams revolve around these 35 characters. They live in a fictional town in a non-fictional city and state."

[(Participant 164)]

"My daydreams are based on a TV show I saw when I was 10. Imagine a television show that kept getting renewed year after year for 30 years. Think of all the experiences you would have watched the characters go through. That is what my mind has been doing for over 30 years. I do not feel like there is any way to possibly describe how in-depth it all is. There have been times I have been caught up in the daydream for entire days. Many nights, I force myself to stay awake and get no sleep so that I can have my 'daydreaming' time."

[(Participant 221)]

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"It stops me from interacting in real world and real people. My relationship with family goes from fine to bad as I did not speak to them often because I would just locked myself in my room. …My school performance worsens. I can't concentrate on studies. I skipped school a lot just to be in my world."

[(Participant 519)]

1.1. The proliferation of discussion of maladaptive daydreaming on the internet

There are hundreds of pages on the Internet devoted to the topic of "maladaptive daydreaming" (herein MD). These websites have been established by individuals from around the world who have concerns about spending enormous amounts of time engaged in highly structured daydreams, often with well-developed characters and plots. Most of the day-dreamers on these site state that they felt like they were the only ones who engaged in this behavior until they discovered these websites. These individuals have diagnosed themselves as "maladaptive daydreamers" (herein MDers), and frequently describe engaging in repetitive movement in conjunction with their daydreams, such as pacing or rocking. Although they state that they never confuse fantasy from reality, many of the daydreamers seek advice on how to stop, claiming they feel as if they have an addiction.

As a consequence, many of the MDers on the Internet forums indicate that they have sought out help from mental health professionals, but most had never heard of the symptoms and seemed to minimize them. Others have been given a differing array of diagnoses including Attention Deficit/Hyperactivity (ADHD) and Obsessive–Compulsive Disorder (OCD). This is not surprising, as MD is not a classified mental disorder or term familiar to mental health professionals. Although "ordinary" daydreaming, when accompanied by other symptoms, including lack of focus and organization, has been implicated in disorders such as ADHD (National Institute of Mental Health, 2012), at this point in time no disorder listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) or in any other classification system describes highly structured and absorbing daydream worlds as a primary symptom.

1.2. Maladaptive daydreaming: Definition attempts

Somer (2002) first introduced the concept of MD, which he defined as "extensive fantasy activity that replaces human inter-action and/or interferes with academic, interpersonal, or vocational functioning" (p. 199). Somer described six patients with severe difficulty in social and vocational functioning, who had seemed to escape reality into a life of fantasy after experiencing abusive childhoods. Their daydreams were often accompanied by movement such as pacing, which Somer termed kinesthetic activity. Somer theorized that MD may have developed as a coping strategy in response to aversive early life experiences.

In 2009, Schupak and Rosenthal presented a case study of a woman troubled by excessive daydreaming. Similar to Somer's (2002) patients, the subject reported that her childhood daydreaming had been accompanied by kinesthetic activity, involving pacing while twirling a string. The daydreaming was eventually reduced and controlled with the treatment of pre-scription medication, Fluvoxamine, commonly used to treat obsessive–compulsive disorders. Unlike Somer's (2002) MDers, this woman did not report an abusive childhood and seemed to function successfully in the real world, suggesting that there may be more than one pathway to MD and varying degrees of psychopathology. The same patient eventually underwent a functional magnetic resonance imaging (fMRI) procedure conducted by researcher Malia Mason. In a 2015 interview describing the fMRI study, Mason stated "The test showed great activity in the ventral striatum, the part of the brain that lights up when an alcoholic is shown images of a martini. Frankly it was super strong" (Bigelsen & Kelley, 2015).

After analyzing surveys by 90 MDers, Bigelsen and Schupak (2011) presented a population of individuals who engaged on average over half (56%) of their waking hours in immersive daydreams, with 80% using kinesthetic activity. Findings indicated that these daydream worlds provided participants with an unending source of comfort and emotional fulfillment, but at the same time caused distress through three factors: (1) difficulty controlling the need or desire to fantasize, (2) concern that the amount of time spent fantasizing interfered with actual relationships and life goals, and (3) intense embar-rassment regarding the fantasy resulting in exhaustive efforts to keep this behavior hidden. Over 70% reported that they did not experience childhood trauma, thereby providing further evidence that trauma, although potentially a contributing risk factor, is not necessarily causal to MD.

1.3. Quantities of daydreaming

To date daydreaming has mostly been seen as a universal experience comprising much of normal mental activity (Klinger, 2009; Singer, 1966). Killingsworth and Gilbert (2010) found that almost half of all human thoughts qualify as daydreaming activity. The reported high levels of daydreaming among the general population may leave clinicians reluctant to consider excessive daydreaming a mental health issue.

A potential source of confusion can arise when researchers use differing definitions to compare daydream quantity. Many definitions of daydream and mind wandering encompass all off-task thought (Singer, 1975; Smallwood, Obonsawin, & Heim, 2003), which is far broader than the activity of interest to the MDers. For this reason Bigelsen and Schupak (2011) chose the term 'fantasy' to describe the behavior of their study population. They defined fantasy by using Klinger's (1971) definition of "a fictional tale created by a subject for his own pleasure and for no other purpose constitutes an instance of fantasy" (p. 6).

Fantasy, defined as above, is considered to occur much less frequently than daydreaming. Klinger (1990) wrote, "Most of us have some fanciful daydreams, but for the majority of us the extremely fanciful ones occupy only a tiny fraction of our thoughts" (p. 83). Yet it is precisely the fanciful daydreaming that the MDers describe as engaging in excessively (Bigelsen & Schupak, 2011; Schupak & Rosenthal, 2009; Somer, 2002).

For the above reasons, fantasy is the more technically accurate term for the mental activity under examination in this article. However, due to the more common usage of the term 'maladaptive daydreaming' and the thousands of individuals who identify as such, and because daydreaming does include the subcategory of fantasy, we will continue to use the term MD to describe the symptoms of concern.

1.4. The fantasy prone person/absorption

A previous line of literature that seems directly relevant to MD is the research on the fantasy prone personality. In 1981 Wilson and Barber (1981) described a category of persons who had highly vivid daydreams in which they engaged for 50% of their waking hours. Although this description of fantasy is similar to that offered by Bigelsen and Schupak (2011), Wilson and Barber (1981, 1982) also found that belief in parapsychological phenomena and confusion between fantasy and reality were central features of the fantasy prone personality. Yet, Bigelsen and Schupak found that 98% of their MDers reported no confusion between fantasy and reality, and few reported belief in parapsychological phenomena. It, therefore, seems that those with MD have some elements of the fantasy prone personality, but not others.

1.4.1. Absorption
Glicksohn and Barrett (2003) found that the trait of absorption which consists of disconnecting from one's current circumstances and becoming immersed in another focus (Ross, Joshi, & Currie, 1990, 1991) can serve as the predisposing factor for the hallucinatory experience. As hallucinations are believed to be on the continuum of normal conscious experiences, which include vivid daydreaming (Slade & Bentall, 1988), MDers may show higher levels of absorption compared to non-MDers.

1.5. Stereotypic movement disorder

In recent years, researchers may have unknowingly been investigating the early stages of MD, through their work assessing repetitive movement in children. Stereotypic movement disorder consists of repetitive, coordinated, and rhythmic behaviors, including hand flapping and pacing (Mahone, Bridges, Prahme, & Singer, 2004). Specifically, Freeman, Soltanifar, and Baer (2010) found active daydreaming in 35 children who had been studied primarily for features of stereotypic movement disorder.

Robinson, Woods, Cardona, Baglioni, and Hedderly (2014) studied ten children who described voluntary engagement in acts of imagery with stereotyped movements. The movements were reported to occur as a secondary response to the imagining activity. Interestingly, stereotyped movements typically occurred when the child was bored or relaxed, which the authors hypothesized is likely to reflect a propensity for a need to increase cognitive stimulation at these times. Accordingly, the authors suggested that engagement in episodes of intense imagery may serve the purpose of increasing cognitive stimulation, while the associated stereotyped movements enhance concentration and may provide a sensory gain. Both studies add further evidence of the connection between repetitive movement and fantasy activity, and they furthermore add to the assumption that stereotypic movement disorder in childhood could represent the childhood precursor to MD. Further investigation is needed to determine if some of those children will eventually develop MD.

1.6. The present study: Goals and hypotheses

Our primary goal was to paint a comprehensive picture of the experiences and symptomology of those with self-reported MD using quantitative and qualitative data from the largest sample of MDers to date compared to a group of non-MDers. We hypothesized that a population of MDers exists that shares unique daydreaming patterns that are different from non-MDers. Specifically we expected differences in terms of daydreaming content and that MDers would experience higher levels of quantity of daydreaming, accompanying behavioral and mental characteristics (i.e. kinesthetic activity and absorption), and distress caused by the daydreaming.

Another goal of this paper was to locate MD in the context of potentially related clinical constructs. We hypothesized that MDers would score significantly higher on pathologies such as OCD and ADHD, as many MDers have reported receiving those diagnoses after seeking help for MD. More specifically, we expected that MDers would score higher on subscales related to obsessive symptoms and inattention, but that there would not be differences on compulsion and impulsivity, because those features have not been described in the anecdotal reports of MD. We also hypothesized that MDers would score higher on items assessing fantasy proneness, absorption and dissociation, but did not expect large differences on items measuring psychosis. Finally, we examined whether MDers differed significantly from non-MDers on trauma history as a possible etiology for MD. Although Somer (2002) proposed that childhood trauma could be a trigger, we hypothesize in line with Bigelsen and Schupak (2011), which found that trauma was not a necessary element of MD, and therefore that MDers and non-MDers would not differ in reports of traumatic experiences.

2. Method

2.1. Participants and procedures

The sample included 447 participants (347 female, 96 male, 2 transgender, 2 omitted). Age range was 13–78 ($M = 30.08$, $SD = 13.94$). Nationalities represented 45 countries (Table 1). Most frequently represented were the United States (46%), the United Kingdom (14%), and Australia (12%).

Participants with MD were recruited via flyers in online chat rooms for MD, psychology, and mental health. Control participants were recruited using chain-referral (snowball) sampling, starting with researchers and MDers who approached individuals without MD in their professional and social networks. All study participants were asked if they considered themselves to be maladaptive or compulsive daydreamers, defined in the recruitment notice as "extensive, compulsive daydreaming that can cause distress or impair functioning." Those who marked Yes (76%) formed the group of self-identified MDers and those who marked No (24%) formed the non-MDer comparison group.

Across the two groups, proportions of males and females were similar, but we found other demographic differences (possibly attributable, in part, to the different recruitment procedures): Compared to non-MDers, MDers were more likely to be students, χ^2 (1, $N = 442$) = 9.58, $p < .01$, $\phi = .15$, had fewer years of education, t (422) = 7.90, $p < .001$, $d = .89$, and were younger, $U = 8316.00$, $p < .001$, $r = -.40$.

The study, along with the inclusion of minors, was approved by the Institutional Review Board (IRB) of the University of Haifa. Participants completed the study online after reading IRB information and agreeing to study procedures.

2.2. Measures

2.2.1. Demographics
Participants provided general demographic information.

2.2.2. Qualitative daydreaming information
Participants were asked to describe recent or typical daydreams in their own words.

Table 1
Basic sample characteristics: total and split by continent.

		N (%)	Age M (SD)	Female N (%)	Years of education M (SD)	Ever married N (%)
North America[a]	MDer	172 (78)	28.20 (12.50)	133 (78)	14.62 (3.55)	33 (19)
	Non-MDer	49 (22)	42.20 (17.71)	39 (81)	17.06 (3.47)	29 (59)
	Total	221 (100)	31.32 (14.97)	172 (79)	15.20 (3.69)	62 (28)
Europe[b]	MDer	97 (90)	25.31 (9.50)	77 (79)	14.42 (2.82)	15 (16)
	Non-MDer	11 (10)	38.45 (11.50)	8 (73)	18.00 (1.83)	5 (46)
	Total	108 (100)	26.65 (10.45)	85 (79)	14.85 (2.98)	20 (19)
Oceania[c]	MDer	27 (47)	23.30 (7.14)	23 (85)	14.52 (2.97)	4 (15)
	Non-MDer	30 (53)	38.87 (16.15)	25 (83)	17.10 (2.76)	15 (50)
	Total	57 (100)	31.49 (14.84)	48 (84)	15.90 (3.14)	19 (33)
Asia[d]	MDer	27 (87)	22.70 (8.10)	17 (63)	14.04 (3.22)	5 (19)
	Non-MDer	4 (13)	43.25 (12.92)	4 (100)	18.00 (0.82)	2 (50)
	Total	31 (100)	25.35 (11.07)	21 (68)	14.61 (3.30)	7 (23)
Africa[e]	MDer	8 (42)	33.13 (15.42)	5 (63)	16.75 (3.01)	3 (38)
	Non-MDer	11 (58)	45.91 (11.84)	9 (82)	18.82 (2.48)	8 (73)
	Total	19 (100)	40.53 (14.58)	14 (74)	17.95 (2.84)	11 (58)
South America[f]	MDer	5 (100)	23.20 (7.60)	2 (40)	15.40 (3.05)	1 (20)
	Non-MDer	0 (0)	n/a	n/a	n/a	n/a
	Total	5 (100)	23.20 (7.60)	2 (40)	15.40 (3.05)	1 (20)
Total Sample	MDer	341 (76)	26.51 (11.13)	261 (77)	14.57 (3.27)	61 (18)
	Non-MDer	106 (24)	41.27 (15.86)	86 (82)	17.42 (3.01)	59 (56)
	Total	447 (100)	30.08 (13.94)	347 (78)	15.30 (3.45)	120 (27)
Statistical test for differences between continents			$F(5, 434) = 5.07$, $p < .001$, $\eta^2 = .06$	$\chi^2(10) = 9.93$, $p = .45$, $\phi = .15$	$F(5, 415) = 3.38$, $p < .01$, $\eta^2 = .04$	$F(5, 434) = 3.02$, $p < .05$, $\eta^2 = .03$

Note. N = count; M = mean; SD = standard deviation; MDer = self-identified maladaptive daydreamer.
[a] USA, Canada, and Mexico.
[b] e.g., UK, The Netherlands, Germany, etc.
[c] Australia and New Zealand.
[d] e.g., India, Singapore, etc.
[e] South Africa and Morocco.
[f] Brazil, Argentina, and Colombia.

Table 2
Qualitative analysis identifying daydreaming content: main categories (based on coded subsample, $n = 141$; and split by MD status; MDer: $n = 85$; non-MDer: $n = 56$).

Category	Examples	Total sub sample n (%)	MD Status		Difference Test χ^2
			MDer n (%)	Non-MDer n (%)	
Romantic/sexual relationship	– Relationship with professor, meeting his family, going on vacations and wedding. – Sexual fantasies of a particular female that I was once attracted to.	37 (26.2)	29 (34.1)	8 (14.3)	6.86**
Celebrity/hero (being one, or in a relationship with one)	– I am rich and famous, living in L.A and engaged to a super model name Sydney. – Discovering I actually belonged to another family and was related to a celebrity. – There is some form of disaster and I rescue many people.	33 (23.4)	31 (36.5)	2 (3.6)	20.38***
Idealized version of self (main character is the daydreamer but with characteristics they envy)	– I am really attractive, rich, intelligent, and have a strong personality. The other characters are always attractive or rich people that love me. – I am myself, but a much better version of me. – My daydream self is an idealized version of myself. She's queen of a country, a singer, actress, wife, mother, and overall genius.	31 (22.0)	29 (34.1)	2 (3.6)	18.37***
Real life scenarios	– Having conversations with a co-worker about an event at work. – Planning my wife's birthday party, envisioning how it will go.	28 (19.9)	6 (7.1)	22 (39.3)	22.03***
Wish fulfillment	– My parents' marriage is awful, so I daydream about life without one of them in the house; happiness, control and a stable home with no violence. – Getting engaged or married. Sometimes to a particular boyfriend. – Winning the lotto and being able to clear all my debts and those of people I care about.	24 (17.0)	5 (5.9)	19 (33.9)	18.80***
Fictional characters taken from another source (i.e. TV show/book/movie/video game)	– Yearlong daydream based off of a video game called Dragon Age Origins. I am Lenobia, and Alistair, my love, and I cannot be together because he has been named king for the good of Ferelden. – I am a superhero (Black Widow) from the movie The Avengers. The character looks like me with a different plot line than the comic books. I'm more bad ass, sexy, but also having a dark side.	16 (11.3)	14 (16.5)	2 (3.6)	5.58*
Imaginary family/friend (daydreamer's self is in these interacting with imaginary people)	– I have an imaginary brother and 5 very close imaginary friends. I add it to real life, imagining they are in social situations with me. – I have current imaginary boyfriend since 2009. We fight a lot and sometimes he's a bully.	16 (11.3)	15 (17.6)	1 (1.8)	8.44**
Popularity and receiving extra attention (sometimes due to illness/vulnerability)	– Making friends and everyone liking me. – Being in the hospital, receiving many cards and presents.	15 (10.6)	12 (14.1)	3 (5.4)	2.73+
Imaginary world (daydreamer's self is not in these and characters are original to the daydreamer)	– A fictional family. All are given names, ages and occupations. One family focuses on five generations of females each born 25 years apart. – It is based around a lady and her position within her Mafia family. There is a full plot line, and includes grandparents, dad and brothers.	14 (9.9)	13 (15.3)	1 (1.8)	6.89**
Death, violence	– Someone broke into my apartment and I was trying to figure out how to fight back. – Accidentally killing my sisters in a car wreck and wailing at the funeral. I choose not to feel the pain of their deaths, but I can feel the pity I get from the people. – A character named 'Seven' who is trapped in an 18th- 19th century insane asylum, he eventually rebels and kills all the doctors and nurses and finally sets the building on fire.	13 (9.2)	10 (11.8)	3 (5.4)	1.66
Negative feelings (revenge, vulnerability)	– It's of resentment and hate as there is a betrayal of trust. – Revenge fantasies against financial advisor who financially devastated me.	12 (8.5)	8 (9.4)	4 (7.1)	.22

Table 2 (*continued*)

Category	Examples	MD Status			Difference Test χ^2
		Total sub sample n (%)	MDer n (%)	Non-MDer n (%)	
Life course changes (fixing past or imaging the future)	– I am going back into the past with the knowledge I have now and reworking the decisions I've already made. – The future. How my children will look like and what they will be doing.	11 (7.8)	6 (7.1)	5 (8.9)	.16
Sci-Fi/Futuristic or not in present time period	– I am transported into the past through a portal. From stone age through old west time periods. – 9 alien worlds with 30–40 reoccurring characters and plot lines. – Time-travel romance. Heroine finds ship-wrecked male from 19th century on the beach.	10 (7.1)	9 (10.6)	1 (1.8)	3.97[*]
Does not daydream	– I don't get daydreams. – No recent daydreams at all.	11 (7.8)	0 (0)	11 (19.6)	18.11[***]

Note. Fisher's Exact tests were conducted for the categories Negative feelings, Life Course Change, SCI-FI, and Does not daydream, as frequency in specific cells was too small. +p < .10.

[*] p < .05.
[**] p < .01.
[***] p < .001.

2.2.3. Daydreaming-specific questions

Thirty-eight questions addressing aspects of the daydreaming experience were developed after reviewing the original data from Bigelsen and Schupak (2011) and Somer (2002). We administered these preliminary items to 10 MDers and solicited their feedback, changing the wording of some items based on that feedback. These questions addressed quantity of daydreaming; its content, type, and experience; the urge to daydream/ability to control daydreaming; experienced distress due to daydreaming; interferences of the daydreaming with life functioning; and perceived benefits of daydreaming (Table 3; items available from the authors). Example items are "How often do you return to recurring daydreams that involve similar people or storylines?", "When the real world interrupts one of your daydreams, on average how annoyed do you feel?", "How often does daydreaming interfere with your relationships with friends, family, co-workers and others?" Participants answered each item on a scale ranging from 0% to 100% in 10% intervals (0% = never/none of the time, 100% = all of the time/extreme amounts).

2.2.4. Obsessive–compulsive symptoms

The Obsessive–Compulsive Inventory-Revised (OCI-R; Foa et al., 2002) is an 18-item self-report measure assessing symptoms of obsessive–compulsive disorder. It includes six subscales: washing, checking, ordering, obsessing, hoarding, and neutralizing. A sample item is: "I get upset if objects are not arranged properly". Answering options range from 0 = *Not at all* to 4 = *Extremely*.

2.2.5. ADHD symptoms

The World Health Organization's ADHD Self-Report Scale (ASRS; Kessler et al., 2005) is a six-question standardized measure based on the DSM (4th ed., text rev.; DSM-IV-TR; APA, 2000) criteria. An example item is: "How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?" Answering options range from 0 = *Never* to 4 = *Very often*.

2.2.6. Psychotic symptoms

The Psychosis Screener (PS; Degenhardt, Hall, Korten, & Jablensky, 2005) evaluates the presence of psychotic symptoms and comprises elements of the Composite International Diagnostic Interview (CIDI; Robins et al., 1988). The measure includes seven items, six of which cover features of psychotic disorders including delusions of control, thought interference, passivity, delusions of reference or persecution, and grandiose delusions. An additional item records a prior diagnosis of schizophrenia. Affirmative responses are summed, and a score of 1 or more indicates possible psychosis.

2.2.7. Sense of presence and immersion

To assess sense of presence while daydreaming and the degree of felt immersion we derived seven questions from tools designed to measure presence in virtual reality worlds (Slater, Steed, McCarthy, & Maringelli, 1998; Witmer & Singer, 1998). For sense of presence, participants were asked to think back to the last two weeks, choose their longest daydream, and answer seven questions regarding their sense of "being there" in the daydream and involvement of their senses (1 = *not at all*, 7 = *totally involved*). The three immersion questions were selected from the Immersive Tendency Questionnaire

Table 3
Differences between MDers (*n* = 341) and non-MDers (*n* = 106) for all specific quantitative maladaptive daydreaming questions.

Item	Short text	MDers		Non-MDers		Independent-samples *t*-test				
		Mean	SD	Mean	SD	*t*	*df*	*p*	*d*	95% CI
Quant1	% of time DDing on typical day	56.85	25.05	15.70	19.87	12.50	445	<.0013	1.83	[34.69, 47.60]
Quant2	% of time DDing on "high daydreaming" day	68.56	23.34	20.07	21.74	13.69	445	<.0013	2.15	[41.55, 55.43]
Quant3	% of time DDing in moving vehicle	71.22	28.77	27.79	29.24	9.72	445	<.0013	1.50	[34.67, 52.19]
Quant4	% of time DDing when alone	73.19	23.17	23.15	27.37	12.16	445	<.0013	1.97	[41.97, 58.11]
Quant5	% of time DDing when in public	34.95	26.07	9.82	16.50	8.30	445	<.0013	1.15	[19.20, 31.07]
Qual1	Freq. that DD include fictional characters or plots	73.37	35.37	19.19	28.24	12.80	445	<.0013	1.69	[45.89, 62.49]
Qual2	Freq. that DD include people not personally known	67.16	38.49	14.18	24.30	12.77	445	<.0013	1.65	[44.85, 61.11]
Qual3	Freq. return to DD involving similar people/plots	85.51	23.67	35.26	33.31	11.17	445	<.0013	1.74	[41.43, 59.07]
Pos	Freq. content is positive/pleasurable	72.18	24.84	50.98	36.57	4.41	445	<.0013	0.68	[11.78, 30.61]
Neg	Freq. content is negative/disturbing	35.93	27.78	20.77	24.62	3.83	445	<.0013	0.58	[7.40, 22.91]
Qual4	Freq. current DD accompanied by physical activity	54.21	39.79	9.58	22.53	10.69	445	<.0013	1.38	[36.45, 52.81]
Qual5	Freq. childhood DD accompanied by physical activity	50.75	40.14	17.33	29.91	6.96	445	<.0013	0.94	[24.02, 42.84]
Qual6	Freq. current DD accompanied by vocal noises	63.20	33.73	14.22	27.02	11.06	445	<.0013	1.60	[40.30, 57.66]
Qual7	Freq. childhood DD accompanied by vocal noises	57.48	36.32	19.24	29.62	8.33	445	<.0013	1.15	[29.24, 47.24]
C10	Freq. confuse DD with reality	14.28	25.14	7.31	16.92	2.27	445	.024	0.33	[0.96, 13.00]
Ctrl1	Difficulty keeping DDing under control	66.14	31.45	9.77	22.28	14.55	445	<.0013	2.07	[48.78, 63.96]
Ctrl2	Strength of urge to return to interrupted DD	66.60	31.80	21.54	29.31	9.91	445	<.0013	1.47	[36.15, 53.98]
Ctrl3	Ability to influence direction of DD	80.97	25.69	54.73	38.74	5.05	445	<.0013	0.80	[16.06, 36.44]
Ctrl4	Strength of urge to start DDing after waking up	62.44	35.10	15.10	27.62	10.63	445	<.0013	1.50	[38.61, 56.08]
Ctrl5	Difficulty staying on-task for something important	63.34	33.11	18.38	25.48	10.73	445	<.0013	1.52	[36.74, 53.17]
Ctrl6	Difficulty staying on-task for something boring	77.81	25.72	26.26	27.82	12.96	445	<.0013	1.92	[43.76, 59.35]
Ctrl7	Difficulty focusing on what others say	34.28	30.36	9.29	21.08	6.78	445	<.0013	0.96	[17.77, 32.22]
Dis1	Annoyance at having DD interrupted	51.76	32.71	13.57	22.22	10.62	445	<.0013	1.37	[31.14, 45.24]
Dis2	Distressed about amount of time spent DDing	63.02	32.43	4.57	15.22	21.28	445	<.0013	2.31	[53.07, 63.84]
Dis3	Distressed about DDing in general	54.62	35.80	5.36	15.92	16.83	445	<.0013	1.78	[43.52, 55.00]
Dis4	Distressed by content of DD	29.09	33.72	12.76	21.11	4.72	445	<.0013	0.58	[9.54, 23.11]
Dis5	Ashamed to tell others about DD	83.50	25.62	21.58	31.51	14.50	445	<.0013	2.16	[53.56, 70.30]
Dis6	Distressed when unable to find time to DD	49.36	35.56	9.35	19.97	11.74	445	<.0013	1.39	[33.34, 46.70]
Ben1	Rather DD than be social or engage in hobbies	59.07	31.22	13.17	25.73	10.74	445	<.0013	1.60	[37.53, 54.27]
Ben2	DD adds creativity to life	55.04	36.76	29.68	31.30	5.55	445	<.0013	0.74	[16.40, 34.33]
Ben3	Find DD comforting/enjoyable	79.68	26.75	42.35	33.57	8.05	445	<.0013	1.23	[28.24, 46.41]
Ben4	DDing helps you deal with everyday life	54.50	36.08	25.99	31.66	6.11	445	<.0013	0.84	[19.37, 37.65]
Ben5	Life is more interesting because of DDing	53.58	37.62	25.13	31.97	5.93	445	<.0013	0.81	[18.98, 37.72]
Func1	DDing interferes with sleep	47.24	33.82	14.94	25.06	7.94	445	<.0013	1.08	[24.32, 40.27]
Func2	DDing interferes with doing basic chores	58.87	32.26	11.01	19.31	14.64	445	<.0013	1.80	[41.45, 54.26]
Func3	DDing interferes with relationships	54.94	34.50	8.67	18.23	13.85	445	<.0013	1.68	[39.71, 52.81]
Func4	DDing interferes with academic/occupational goals	60.97	36.77	12.92	21.07	12.35	445	<.0013	1.60	[40.42, 55.67]
Func5	DDing interferes with life goals	63.11	35.56	6.32	17.08	16.81	445	<.0013	2.04	[50.17, 63.41]

Note. DD = daydreaming; *M* = mean, *SD* = standard deviation, *t* = *t*-statistic, *df* = degrees of freedom, *p* = *p*-value, *d* = Cohen's *d*. Quant = Quantity, Qual = Quality, Pos = Positive, Neg = Negative, C10 = Psychosis, Ctrl = Control, Dis = Distress, Ben = Benefits, Func = Functioning. Bonferroni-corrected significance level is .0013. 95% CI is the 95% confidence interval for the mean difference.

(Witmer & Singer, 1994) and asked questions regarding how involved participants were when watching a TV show or movie and the strength of their ability to block out external distractions when involved in a task or activity.

2.2.8. Dissociative experiences

The Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986), the most widely used measure of dissociative experiences (Somer, Dolgin, & Saadon, 2001), assesses the frequency of dissociative experiences using 28 self-report items. An example is: "Some people have the experience of finding themselves in a place and have no idea how they got there. Circle a number to show what percentage of the time this happens to you." Answering options range from 0% = *Never* to 100% = *All the time*, in increments of 10%.

2.2.9. Fantasy proneness

The Creative Experiences Questionnaire (CEQ; Merckelbach, Horselenberg, & Muris, 2001) is a 25-item self-report measure to assess fantasy proneness. Items assess profound involvement in fantasy, developmental antecedents of fantasy proneness, and the consequences of fantasizing. Participants indicate *yes* or *no* to statements such as: "As a child, I thought that the dolls, teddy bears, and stuffed animals that I played with were living creatures." A higher sum score of affirmative answers (1 = *Yes*, 0 = *No*) indicates higher levels of fantasy proneness.

2.2.10. Traumatic experiences

The Trauma History Screen (THS; Carlson et al., 2011) was used to assess exposure to high magnitude stressor events. The measure includes a list of stressful events, such as forced sexual contact as a child or adult, where the participant is asked

whether they have experienced the event and if answered affirmatively to report the number of times the event had occurred. The sum of the number of traumatic events reported was used as indicator.

2.3. Data-analytic plan

Qualitative data analysis was conducted following procedures described as "open coding" in grounded theory (Glaser & Strauss, 1967) as well as "clustering" or "theme identification" (Miles & Huberman, 1994). Specifically, we developed a coding scheme reflecting common themes using answers of 10 randomly chosen participants. We then discussed and refined the coding schema on the basis of the answers of another 10 randomly chosen participants, and continued this procedure until no new major categories emerged, indicating saturation. The final coding schema had 14 main categories, and was used by two well-trained coders. Inter-rater reliability was high (Kappa = .96).

Quantitative analyses were done in SPSS 22 and R (R Core Team, 2013). Due to a significant difference in age between MDers and non-MDers, we employed a propensity score analysis, to correct for these mean differences while conducting significance tests and effect size estimates. Propensity score analysis (Rosenbaum & Rubin, 1983) is appropriate to use when comparing groups that are non-equivalent at the outset of the study, a common occurrence in observational studies. We estimated propensity scores using the R package twang (Ridgeway, McCaffrey, Morral, Burgette, & Griffin, 2015), which implements generalized boosted regression.

Our propensity score model was a logistic regression model. We used a propensity score model with age and race. This model converged, and resulted in weighted data that no longer containing significant differences between the two groups on age and race, as well as education level and student status.

Group differences in mean scale scores and in mean responses to individual items were analyzed with propensity score-adjusted independent-samples t-tests. When conducting multiple tests for specific items of a scale, we used a Bonferroni correction on the p-values. The significance level used in Table 3 was equal to the desired level (.05) divided by the number of MD-related items (38), i.e. p = .05/38 = .0013, and the level used in Table 4 was equal to the desired level (.05) divided by the number of other clinical scale and subscale scores (17), i.e. p = .05/17 = .0029. Our hypothesis regarding lack of group differences in number of traumatic childhood events was tested with the Rao and Scott (1987) adjustment to the chi-square statistic test for independence between two categorical variables.

3. Results

3.1. Qualitative information on daydreaming themes

Content of daydreaming was analyzed using the answers to open-ended questions on daydreams from 141 randomly selected study participants (MDers: n = 85, 60%; non-MDers: n = 56, 40%; see Table 2 for themes and examples). Among MDers, the three most popular daydream themes included being a celebrity or having a relationship with a celebrity (37%), having an idealized version of self (34%), and being involved in a romantic relationship (34%). These content topics were significantly less often mentioned by non-MDers. MDers also reported more daydreams of ongoing stories with fictional characters, such as daydreams with characters borrowed from favorite TV shows/books/movie/videos (17%), having an imaginary family/friend (18%), or fantasy world daydreams with original fictional characters (15%). Instead, daydreams of the non-MDers were more often based in real life (39%) or concrete wish fulfillment (34%), such as winning the lottery or having differing outcomes to current problems at work.

3.2. MD specific questions

MDers and non-MDers differed on all aspects addressed by the daydreaming-specific quantitative questions, including daydreaming content, accompanying behavior (i.e. kinesthetic activity), immersion/absorption, the ability to limit daydreaming, experienced distress due to daydreaming, interferences of the daydreaming with life functioning; and perceived benefits. Specifically, MDers endorsed all MD-related items at significantly higher rates than non-MDers (all ps < .0013; see Table 3), except for the item about confusing daydreams from reality (labeled C10).

MDers spent a large amount of their lives engaging in fantasy activities: on an average daydreaming day MDers reported spending 57% (SD = 25%) of their waking hours in fantasy activities compared to 16% (SD = 20%) of the hours for non-MDers, t (445) = 12.50, p < .0013, 95% confidence interval (CI) for the mean difference = [34.69%, 47.60%], d = 1.83. On "high daydreaming days", this percentage went up to 69%. The daydreaming activities of MDers increased in moving vehicles (71% of the time, SD = 29%) and when alone (73% of the time, SD = 23%).

The content of the daydreams differed between the two groups as well, supporting findings from the qualitative analysis. MDers reported daydreaming about fictional characters or historical figures 73% (SD = 35%) of the time, compared to non-MDers who reported doing this only 19% (SD = 28%) of the time, t (445) = 12.80, p < .0013, 95% CI for the mean difference = [45.89%, 62.49%], d = 1.69.

Kinesthetic activity accompanied the daydreaming activities of MDers frequently. 82% of MDers reported engaging in repetitive movements, such as pacing, or rocking, for at least 10% of the time. Also, MDers were more likely to vocalize while

Table 4
Performance of self-reported MDers (*n* = 341) and non-MDers (*n* = 106) on other clinical measures.

Scale	MDer		Non-MDer		Independent-samples *t*-tests				
	M	*SD*	*M*	*SD*	*t*	*df*	*p*	*d*	95% CI
CEQ	13.32	4.01	9.11	5.52	5.36	445	<.0029	0.87	[2.67, 5.75]
ASRS total	3.57	1.54	2.14	1.66	6.00	445	<.0029	0.89	[0.96, 1.89]
Inattention	2.75	1.25	1.66	1.32	5.66	445	<.0029	0.85	[0.71, 1.47]
Impulsivity	0.82	0.76	0.48	0.61	3.77	445	<.0029	0.48	[0.16, 0.51]
OCI-R total	20.05	13.14	12.24	10.67	4.74	445	<.0029	0.65	[4.58, 11.05]
Washing	1.53	2.59	1.39	2.03	0.44	445	.661	0.06	[−0.50, 0.80]
Checking	3.16	3.10	1.61	1.98	4.87	445	<.0029	0.60	[0.93, 2.18]
Ordering	3.56	3.32	2.64	2.64	2.25	445	.025	0.31	[0.12, 1.73]
Hoarding	4.05	3.24	2.74	2.33	3.78	445	<.0029	0.46	[0.63, 1.98]
Obsessing	6.09	3.73	3.15	3.46	5.73	445	<.0029	0.82	[1.94, 3.95]
Neutralizing	1.67	2.43	0.71	1.28	4.18	445	<.0029	0.49	[0.50, 1.40]
DES Total	28.40	17.28	15.16	17.52	4.66	445	<.0029	0.76	[7.52, 18.44]
Absorption	43.87	22.37	22.32	23.31	5.73	445	<.0029	0.94	[13.92, 28.41]
Amnesia	8.77	12.68	6.76	16.81	0.68	445	.498	0.13	[−3.57, 7.36]
Depersonalization	18.38	22.08	7.42	13.36	5.23	445	<.0029	0.60	[6.77, 14.89]
Psychosis screener	0.77	1.16	0.67	1.09	0.59	445	.555	0.10	[−0.25, 0.46]
SPD	3.62	1.19	1.93	1.27	8.78	445	<.0029	1.38	[1.31, 2.07]

Note. MDer = self-reported maladaptive daydreamer, non-MDer = self-reported non-MDer. *M* = mean, *SD* = standard deviation, *t* = independent-samples *t*-statistic, *df* = degrees of freedom, *p* = *p*-value, *d* = Cohen's *d*. CEQ = Creative Experiences Questionnaire; ASRS = ADHD (Attention Deficit/Hyperactivity Disorder) Self-Report Scale; OCI-R = Obsessive-Compulsive Inventory – Revised; DES = Dissociative Experiences Scale; SPD = Sense of Presence in Daydreaming. Bonferroni-corrected significance level is .0029. 95% CI is the 95% confidence interval for the mean difference.

daydreaming. MDers reported doing this 63% of the time (*SD* = 34%) while non-MDers reported doing this 14% of the time (*SD* = 27%), *t* (445) = 11.06, *p* < .0013, 95% CI for the mean difference = [40.30%, 57.66%], *d* = 1.60.

Furthermore, the results demonstrated that MDers felt substantially hindered in everyday functioning. MDers indicated that their daydreaming caused interference with their life goals in 63% (*SD* = 36%) of the time, while non-MDers reported this problem only 6% of the time (SD = 17%), *t* (445) = 16.81, *p* < .0013, 95% CI for the mean difference = [50.17%, 63.41%], *d* = 2.04. For the other areas of functioning, MDers reported interference by their daydreaming in 47% (sleep) to 61% (academic/occupational goals) of the time, while non-MDers reported interference much less often (between 9% and 15% of the time). When combining all functioning items (i.e., sleep, chores, relations, academic/occupational goals, life goals), we found that almost all MDers (i.e., 97%) reported interference in any of these areas, while only one third (34%) of the non-MDers reported similar issues. (In comparison to the kinesthetic activities, we used a somewhat stricter criterion of 20% of the time, given "normal" daydreaming may also interfere with desired activities).

There were also some interesting similarities in endorsement rates between MDers and non-MDers. Differences between both groups were quite small for items on valence (frequency of positive/pleasurable or enjoyable content), feeling distress by content of daydreams, and daydreaming adding creativity and interest to life.

3.3. Links between MD and other disorders

As shown in Table 4, MDers and non-MDers differed significantly on the studied clinical scales, with MDers scoring higher on all measures. The strongest effect size was for the questionnaire measuring a sense of presence during daydreaming (*d* = 1.38) and the DES Absorption subscale (*d* = 0.94). The smallest difference between MDers and non-MDers was on the OCI-R Washing subscale (*d* = 0.06) and the psychosis measure (*d* = 0.10). Also, there were no significant differences between the groups on diagnoses of schizophrenia. The mean psychosis screener score among MDers fell below the empirically derived cutoff scores of 3, suggesting no comorbidity of schizophrenia among MDers (Degenhardt et al., 2005).

As is shown in Table 4, MDers scored higher than non-MDers on total OCD score, *t* (445) = 4.74, *p* < .0029, 95% CI for the mean difference = [4.58, 11.05], *d* = 0.65. However, it is evident that the group differences were much larger for the obsessing subscale (*t* (445) = 5.73, *p* < .0029, 95% CI for the mean difference = [1.94, 3.95], *d* = 0.82) than for subscales such as washing (results given above) and ordering (*t* (257.51) = 4.78, *p* < .001, 95% CI for the mean difference = [0.80, 1.91], *d* = 0.44). The mean OCI-R total score among MDers fell below the empirically derived cutoff scores of 21 (Abramowitz, David, Tolin, & Diefenbach, 2005), suggesting no comorbidity of OCD among MDers.

MDers also endorsed both the inattention subscale (*t* (445) = 5.66, *p* < .0029, 95% CI for the mean difference = [0710, 1.47], *d* = 0.85) and impulsivity subscale (*t* (445) = 3.77, *p* < .0029, 95% CI for the mean difference = [0.16, 0.51], *d* = 0.48) of the ASRS at significantly higher rates than non-MDers. However, the two most highly endorsed items by the MDers were inattention items, items 2 and 4, with *d*s = 0.87 and 0.90, respectively. Both samples scored within the low negative range for ADHD (Kessler et al., 2005), suggesting no comorbidity of ADHD among MDers.

MDers also scored higher than non-MDers on the DES overall (*t* (445) = 4.066, *p* < .0029, 95% CI for the mean difference = [7.52, 18.44], *d* = 0.76). However, MDers and non-MDers differed most on the absorption subscale (*t* (445) = 5.73, *p* < .0029,

95% CI for the mean difference = [13.92, 28.41], d = 0.94). The mean DES total score among MDers fell below the empirically derived cutoff scores of 30 (Somer et al., 2001), demonstrating an unlikely comorbidity of known dissociative disorders among MDers.

Finally, MDers scored higher on the CEQ compared to non-MDers (t (445) = 5.36, p < .0029, 95% CI for the mean difference = [2.67, 5.75], d = 0.87). However, items that were explicitly related to the quantity or quality of daydreams, such as Item 9 ("I spend more than half the day fantasizing or daydreaming"; t (445) = 13.28, p < .0029, 95% CI for the mean difference = [0.59, 0.79], d = 1.89), resulted in larger between-groups differences in endorsement rates. By contrast, items assessing belief in paranormal activity, such as Item 22 ("I often have the experience of thinking of someone and soon afterwards that particular person calls or shows up"; t (445) = −1.18, p = .24, 95% CI for the mean difference = [−0.22, 0.06], d = −0.17), were actually endorsed more often by non-MDers than by MDers.

3.4. Links between traumatic childhood events and MD

A Rao–Scott chi-square test of independence (the correction yields an F-statistic) showed that there was not a significantly different distribution of the total number of childhood traumatic events between MDers and non-MDers, F (4.25, 1895.60) = .91, p = .46. More specifically, 43% of MDers and 48% of non-MDers reported no traumatic childhood events.

4. Discussion

The present study provides evidence of the existence of a distinct population of daydreamers who engage in extensive daydreaming activities that they find enjoyable, but also distressing and hindering to life functioning. We demonstrated that MD differs significantly from normative daydreaming in terms of quantity, content, accompanying behavior (i.e. kinesthetic activity), immersion/absorption, controllability, distress, and interference with life functioning.

4.1. Daydreaming quantity and themes

Using questions that excluded any off-task thought and instead focused on fantasy, MDers reported spending on average 57% of their waking hours in fantasy activity (compared to 16% of the hours for non-MDers). This finding is consistent with Bigelsen and Schupak (2011) who found that MDers spent 56% of their waking hours in fantasy activity. Findings further indicated that the fantasy content of the two groups also differed greatly. MDers reported more daydreams with fictional characters and elaborate plots, often occurring in different time periods or using specific fictional genres (i.e., cartoon, science fiction), whereas the daydreams of non-MDers seem to be based in reality or wish fulfillment and were usually devoid of fictional characters. The more entertaining and creative nature of the fantasy among MDers may help explain why this manner of daydreaming is both more enjoyable and difficult to limit. Interestingly, there were some study participants who did not self-identify as MDers, but who still described highly detailed fantasies that appeared similar to those of MDers. It is, therefore, conceivable that a third group of daydreamers exists that has the ability to engage in enhanced, highly detailed daydreams but who are not distressed by them.

4.2. Experience of daydreaming (kinesthetic activity/immersion)

Similar to Bigelsen and Schupak (2011), over 80% of MDers reported that kinesthetic activity accompanied at least some of their daydreaming activities. This is consistent with Robinson et al. (2014) who have theorized that the movement can increase sensory stimulation, which potentially could facilitate the imagery process. Alternatively, it could also be the case that kinesthetic activities may facilitate a deeper, almost hypnotic-like daydream state, and make it easier to block out real world stimuli, which would correspond to anecdotal reports from MDers in our sample.

The largest differences between the groups were on items regarding the sense of presence and absorption in the daydreaming. There were also large differences in the degree of involvement of the visual and auditory experiences. Several MDers reported that their daydreams would often make them laugh or bring them to tears, providing further corroboration for the emotional properties of many MD fantasies. This finding demonstrates that it is not only the themes and quantity of daydreaming that differentiates MDers from non-MDers, but also the depth and engulfing nature of the fantasy experience. MDers seem to have an ability to completely immerse themselves in a daydream world that is not shared by non-MDers, which appears to be the biggest difference between the two groups. This capacity to feel present in an alternate self-scripted world may be another reason why it is so compelling and so difficult to control. The high levels of absorption are consistent with Glicksohn and Barrett (2003) who found that the trait of absorption underlies hallucinatory experiences, which can include vivid daydreams.

4.3. Control/distress and interference with life functioning

Other large differences between the research groups involved difficulty in limiting the daydreaming and feeling distressed over time spent daydreaming. MDers seem to crave these daydream experiences to such a degree that they have

difficulty limiting it, as indicated by MDers reporting to daydream all day including at night, thereby compromising quality of sleep (and in the long-run their health). Over half of the MDers reported a strong urge to immediately start daydreaming upon waking up or to immediately return to a daydream after being interrupted by an event in the real world. It is this difficulty in keeping the daydreaming under control and out of the way of real life pursuits that have MDers continuing to seek help. Interestingly, one of the smallest differences between MDers and non-MDers involved the ability to control the daydream when being with other people, thereby demonstrating that MDers may be able to reduce daydreaming when necessary (i.e., when socially inappropriate), thereby showing some degree of control over this mental activity. In other words, MDers seem to be able suppress their daydreaming when they absolutely have to (i.e., when in public or when their attention resources are captured by urgent or compelling real world demands), but experience difficulty fighting the urge to daydream in other circumstances.

One of the main causes of distress associated with MD was reported interference with achieving life goals. If one is spending an average of 57% of his or her waking hours on under-controlled fantasy activity, it is not surprising that it is also jeopardizing fulfillment of life goals that take time and attention to achieve, underscoring the need learn more about MD and to find appropriate treatments.

4.4. The Relationship between MD and other clinical constructs

Our finding that MDers endorsed higher levels of symptomology on all subscales of both the ADHD and OCD measures was not expected, as we had assumed to find a pattern including significant differences in inattention and obsessive symptoms and non-significant differences in impulsivity and compulsive behaviors. The present findings may indicate a more general higher level of distress for this frustrated group of sufferers. However, the specific links between the MD questions and the OCI-R were far stronger for the obsessive symptoms than for the compulsive symptoms associated with the behavioral facet of OCD. In fact, one of the smallest differences between the two groups was on compulsive behavior such as washing. This demonstrates that the response pattern does not reflect a mere endorsement response bias and that the mental activity of MD is more similar to thought rumination than to ritualistic behavior.

There were also larger effects for the differences between the groups on the ASRS items measuring inattention than those measuring hyperactivity. This is not surprising considering attention would be expected to be depleted when it is being divided between external and imaginal activities. The differences in attention between the two groups corresponds with new research by Robinson, Woods, Cardona, and Hedderly (2016) which found that children who presented with stereotypic movements/kinesthetic activity in conjunction with intense imagery/fantasy activity demonstrated impaired performance on tests of attention but strengths in memory or oral expression.

The psychosis questions produced the smallest effect sizes among the measures, and there was no difference between confusing the daydreaming with reality or diagnoses of schizophrenia. This demonstrates that the fantasies therefore do not seem to resemble hallucinations that are usually more circumscribed and experienced as involuntary, but rather reported as intentional weaving of engaging stories where the daydreamer is fully aware that they are only imaginings.

Although MDers scored highly on fantasy proneness, they were more likely to endorse fantasy proneness items related to extensive enjoyment of fantasy and much less likely to endorse items describing belief in the paranormal. MDers seem to only be "fantasy prone" when considering those items that directly measure fantasy.

Overall, findings suggest that MDers endorse certain features of several other disorders, suggesting some overlapping symptoms. However, none of the measures seem to adequately capture all of the features of MD, and only some of the elements/subscales of each measure seem relevant to MD. Additionally, the mean scores of all measured mental health scales among MDers fell below the pathological threshold, demonstrating MD clinical distinctness and no comorbidity of MD with related psychopathologies. However, given that this is the first study of its kind, more research is warranted to ascertain whether MD is an unrecognized unique disorder or if it is a little discussed symptom of a currently known disorder.

4.5. Childhood traumatic events

Somer (2002) proposed that MD could be a coping strategy in response to aversive childhood experiences. Yet, the present study found no significant differences in reported traumatic experiences. As this study assessed a wide range of traumatic experiences, future studies should investigate whether different types of trauma or their severity may be associated with MD. It is possible that severe trauma may increase the motivation of young victims capable of vivid fantasizing to escape their harsh realities into their imaginary worlds. However, consistent with Bigelsen and Schupak (2011), the current results demonstrate that childhood trauma is not a prerequisite to developing MD.

4.6. Limitations

Despite the novelty and strengths of the present study, some limitations must be acknowledged. Although our sample was large and internationally diverse, as MD is a yet unrecognized clinical phenomenon, there is currently no other way to recruit large groups of MDers other than to use Internet sites dedicated to MD. Additionally, prior to the completion of this study there was no criterion or tool to objectively identify MD, and we therefore had to rely on self-report to determine MD status. As these individuals are seeking out help and self-identifying as suffering from a disorder, they may be expected

to have overall higher rates of mental health issues than participants who do not self-report MD. However, the results demonstrated the strongest differences between the groups were for features thought to be most associated with MD, as opposed to an overall higher endorsement bias or overall higher rates of mental illness. Most importantly, as a primary purpose of the study was to paint a picture of what those who think they have MD are experiencing and how it differs from the experience of the general population, for this particular study, the recruitment methods, albeit unusual, were what was necessary to describe this phenomenon and understand its symptomology.

Another potential issue related to our recruitment strategy was that MDers were less educated than the individuals forming the comparison group, which seems due to the fact that the MDers were more likely to be students and younger in age. Although it would have been desirable to recruit groups of identical mean age and education, we used propensity scores to statistically control for these differences between MDers and non-MDers. Yet, we found similar mean level differences across both group, whether or not we controlled for these underlying basic characteristics.

Given the strong evidence collected in this study that MD may indeed be a unique clinical syndrome, we utilized this data set to develop an MD questionnaire (Somer, Lehrfeld, Bigelsen, & Jopp, 2016) to provide researchers with a measure able to reliably identify MD for future studies. Thus, future studies could recruit representative samples and investigate levels of MD or prevalence rates in the wider population.

5. Conclusions

The present study is the largest investigation to date to shed light on maladaptive daydreaming behavior reported by thousands of individuals around the world on a multitude of websites, most likely indicating an untold number of others, including those who are not accessing the Internet or who do not speak English. Many of these individuals correspond frequently with us asking for help and often describe being rebuffed by members of the mental health community who are unaware of this phenomenon. Thus, learning more about the specific symptoms involved and developing methods to assess MD is urgently needed to raise the awareness of mental health professionals and to develop intervention approaches.

We are hopeful that our study will spawn a new line of research so that those with MD will no longer feel misunderstood when seeking help and will one day have the benefit of reliable assessment and evidence-based treatment. In the future, studies are needed that address the prevalence of MD in the general population, its etiology, and potential benefits, such as increased creativity. Future studies should also investigate how often childhood stereotypic movement disorder leads to MD in adulthood and the possible existence of a third group of extensive daydreamers that may have enhanced enjoyment of daydreaming but who do not seem to be hampered by it.

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