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Research Article

Childhood Trauma, Social Anxiety, Absorption and Fantasy Dependence: Two Potential Mediated Pathways to Maladaptive Daydreaming

Somer E* and Herscu O

Abstract

This study explored the relationships of childhood trauma, social anxiety absorption and fantasy dependence with maladaptive daydreaming (MD), a newly discovered behavioral addiction involving pervasive immersive, fanciful daydreaming that creates distress and dysfunction. Based on the responses of 315 university students, our data showed that MD correlated significantly with childhood trauma and social anxiety, with moderate effect sizes for both correlations. MD also significantly correlated with absorption and fantasy addiction with large effect sizes. After controlling for the relationships between the independent variables, childhood trauma and social anxiety no longer significantly correlated with MD, implying mediation. Although absorption did not mediate the relationship between social anxiety and MD, our mediation model suggested that childhood trauma and social anxiety may be independent risk factors for MD and that addiction to fantasy was an important mediating variable, explaining 65% of MD variance.

Keywords

Child abuse, Social phobia, Behavioral addiction, Fantasy, absorption, Maladaptive daydreaming

Introduction

The concept of maladaptive daydreaming (MD) was first introduced in a study on six patients with severe impairment of daily functioning who preferred to avoid hardships associated with abusive childhoods by developing inner worlds of fantasy [1]. The current study aims to shed further light on potential developmental pathways to MD, defined as a pathological form of fantasy that can cause distress and "replaces human interaction and/or interferes with academic, interpersonal or vocational functioning" (1 p. 199).

Although a related term, fantasy proneness (FP), was used earlier to describe the penchant for an elaborate fantasy life [2], we believe MD and FP are distinct constructs. In contrast to MD (the focus of the current study), FP ostensibly represents generally adaptive experiences, fantasy abilities and personality traits. FP does not seem to provide an adequate definition for the compulsive, vivid,

fanciful fantasizing labeled MD. Conversely, Wilson and Barber [2] characterized FP as containing psychic experiences (pp. 359-360), realistic out-of-the-body experiences (p. 360) and imagery experiences of apparition-like entities such as "goblins, gargoyles, monsters that seemed to be from outer space" (p. 364). Notably, Wilson and Barber also proposed an alternative pathway to a more extreme form of fantasy as a means of coping with loneliness or isolation and escaping from aversive environments. Among individuals with a history of childhood abuse, the incidence of FP ranged between 9% and 14% [3]. In sum, FP may have some relationship with MD, but many of its described experiences seem dissimilar to those of MD [4]. Evidence suggests that MD is predominantly an immersive disorder that is akin to dissociative absorption and associated with an extremely rewarding innate predisposition for vivid fantasy that is also potentially addictive [5]. In the current study, therefore, we investigate the role of absorption—defined as a disconnection from one's current circumstances, both external and psychological, and the immersion in another focus [6,7] in the development of MD.

The rewarding, often compensatory yearning for MD was identified as an important factor of the MD construct [8]. Sufferers recently described the experience of MD as an uncontrollable behavior [4] fueled by a desire for the gratifying inner experience. They described this craving as an irresistible, time-consuming dependency [5]. In this research study, we also intend to assess the mediating roles of both absorption and addiction to fantasy in the relationship between childhood adversity and MD.

Consistent with Hilgard's hypothesis that hypnotizability is related to a history of physical punishment [9,10], others have shown that a history of imaginative involvement is indeed linked with exposure to aversive childhood experience, including harsh physical and sexual abuse [11]. Recent data on the role of trauma in MD is inconclusive. A large-scale quantitative study showed no significant differences between maladaptive daydreamers (MDers) and non-MDers in reported traumatic experiences [4]. Yet in-depth interviews with 16 individuals seeking online peer support and advice for MD showed that when their predisposition for absorptive fantasy interacted with childhood trauma and neglect, MD became an effective dissociative distraction [5]. In this study, we aim to further explore the importance of childhood trauma in the development of MD, the extent to which trauma correlates with absorption and addiction to fantasy and the relative roles these two independent variables play in predicting MD.

Twenty-four percent of MDers reported impairment in social skills and social isolation [12]. Recent data on MD indicated that social inadequacy and isolation may indeed play a role in the development and maintenance of MD [13]. In this study, we did not postulate that social anxiety is necessarily associated with dissociative absorption, as childhood trauma would be. We aimed to gauge the relationship between social anxiety and MD and the mediating role played by addiction to fantasy as possible psychological sustenance for socially deprived individuals.

We hypothesized that childhood trauma, social anxiety, absorption capacity and the addiction to fantasy are all related to MD. We also postulated two potential mediational models for MD:

*Corresponding author: Eli Somer, Ph.D. Clinical Professor of Psychology School of Social Work, University of Haifa, 199 Aba Khoushy Ave, Haifa 3498838, Israel; E-mail: somer@research.haifa.ac.il

1) We predicted that childhood trauma would be correlated with MD but that the relationship between the variables would be mediated by absorption and addiction to fantasy.

2) We also anticipated that social anxiety would be correlated with MD but predicted that the relationship between social anxiety and MD would be mediated by addiction to fantasy.

Methods

Procedure

Subsequent to approval by the university research ethics review board, permissions were obtained from university lecturers to enter their classes and to solicit anonymous student participation in this study. Professors in the departments of psychology, sociology, social work, art history, performing arts, computer science, biology and mathematics provided access to their classes. The students received a general explanation about daydreaming and about the purpose of the study. They were then asked to provide informed consent for their volunteer participation. Consenting students proceeded to complete the research forms, a process that lasted 20-30 minutes. In the event that they experienced distress, participants were encouraged to contact the researchers at any time following completion of the research questionnaires. Three students called to share non-distressful positive reactions.

Participants

Our research team entered several classes, giving them access to 530 students. Of these, 315 (60% response rate) agreed to take part and completed the research questionnaires in full. The sample comprised 223 women (70%); 252 (80%) were between the ages of 20 and 30 (*M*=28, *SD*=6.43). The largest group of participants identified themselves as Jewish (*n*=261, 83%); the rest were Christian (7%), Druze (6%) and Muslim (4%). Most participants were social science students (n=161, 51%), undergraduates (*n*=228, 71%) and single (*n*=187, 59%).

Measures

All the research instruments in this study that were originally in English were forward-translated into Hebrew by a bi-lingual mental health professional and then back-translated into English by a professional translator who had not been previously involved in the project and had no prior knowledge of its objectives or its specific context. The researchers compared the original and back-translated versions. Particularly problematic words or phrases that did not completely capture the concept addressed by the original item were revised until consensus was achieved [14].

Socio-demographic questionnaire

Participants provided general demographic information pertaining to their gender, age, religion/ethnicity, marital status and area of study.

Childhood Trauma Questionnaire (CTQ)

The CTQ is a self-report instrument covering 28 items ranked on a 5-point Likert scale to rate the severity of emotional abuse and neglect, physical abuse and neglect, and sexual abuse. It has been validated in terms of psychometric test properties in samples of psychiatric patients, i.e., drug and substance abusers, and yielded Cronbach's alpha scores ranging between .82 and .94 [15]. Cronbach's alpha of the Hebrew version of the CTQ was .9.

Maladaptive Daydreaming Scale (MDS)

The MDS is a self-report instrument covering 14 items ranked on a 11-point Likert scale to rate the severity of maladaptive daydreaming in the preceding month. MDS items assess five key characteristics of MD: MD Content/Quality (2 items), MD Compulsion/Control (4 items), MD Distress (3 items), Perceived Benefits of Daydreaming (2 items) and Interference with Life Functioning (3 items). A 3-correlated-factors model best represented the underlying dimensions: yearning, kinesthesia and impairment. These factors captured related rewarding experiences and movement associated with the fantasizing activity, as well as psychological impairment of MD. The MDS discriminated well between self-identified individuals with and without MD, demonstrated good validity and yielded a Cronbach's alpha score of .91 [8]. Cronbach's alpha of the Hebrew MDS was .92.

Severity of Dependence Scale for Fantasy (SDSF)

The SDSF is 5-item scale developed for this study based on the Severity of Dependence Scale (SDS), which was originally designed to measure cannabis dependence using a 4-point Likert scale. All references to cannabis were altered to refer to fantasy/daydreaming [16]. The SDSF items asked the following questions in reference to the last three months:

1) Did you ever think your fantasizing/daydreaming was out of control?

2) Did the prospect of missing an opportunity to fantasize/daydream make you very anxious or worried?

3) Did you worry about your fantasizing/daydreaming?

4) Did you wish you could stop fantasizing/daydreaming?

5) How difficult would you find it to stop or go without fantasizing/daydreaming?

The SDS yielded a Cronbach's alpha score of .83. Cronbach's alpha of the Hebrew SDSF was .8.

Social Phobia Inventory (SPIN)

The SPIN is a 17-item self-rating scale for social anxiety disorder ranked on a 5-point Likert scale. The SPIN refers to the past week and includes items assessing each of the symptom domains of social anxiety disorder: fear, avoidance and physiologic arousal. Cronbach's alpha scores for the SPIN ranged between .87 and .92 [17]. Internal consistency for the Hebrew version of the instrument was also high (*α*=.91).

Tellegen Absorption Scale (TAS)

The TAS measures absorption [18]. It is one of the 11 component scales of the larger Multidimensional Personality Questionnaire [19]. The TAS contains 34 self-report items. Two scoring versions exist. One is scored as item endorsement or rejection. We used a version that allowed for ranking responses on an 11-point Likert scale. The items assess an individual's openness to experience as well as emotional and cognitive alterations across a variety of situations [20] that are associated with periods of relaxed focused attention [21]. The instrument showed high levels of internal reliability (r=.88) on a study sample of college students [18]. The current Hebrew translation of the TAS showed an even higher level of internal reliability (*α*=.96).

Data Analysis

To determine the correlations between our research variables, to measure partial eta-squared effect sizes and to conduct regression analyses, we used IBM SPSS Statistics version 21. To test our model, we used both the PROCESS macro for SPSS [22] and structural equation modeling (SEM) [23]. Both statistical methods produced similar outcomes. For reasons of efficiency and convenience, we decided to demonstrate the results yielded by SEM with IBM SPSS Amos V.21 [24].

Results

As shown in Table 1 and in line with our hypothesis, MD correlated significantly with childhood trauma (r_{15}=.24) and social anxiety (r_{25}=.25), with moderate effect sizes for both correlations. MD also significantly correlated with absorption (r_{35}=.64) and fantasy addiction (r_{45}=.69), with large effect sizes for the latter relationships. Because significant correlations were also found among the independent variables of this study, we also needed to control for these relationships when calculating their relative impact on our dependent variable (MD). Table 2 presents the partial correlation coefficients of the study variables. After the effects of the remaining variables were removed, the correlation between MD and absorption was lowered ($r_{35.124}$=.58<r_{35}=0.64, p<.01), as was the correlation between MD and addiction to daydreaming ($r_{45.123}$=.64<r_{45}=.7, p<.01).

Table 2 also shows that after the effects of the remaining variables were removed, childhood trauma and social anxiety no longer significantly correlated with MD ($r_{25.134}$=.04, ns; $r_{15.234}$=-0.03, n.s., respectively). This finding implies mediation. Additionally, we found that when the effect of social anxiety only was controlled, the correlation between childhood trauma and MD was $r_{15.2}$=.18, p<.01. When we controlled for the effect of childhood trauma only,

the correlation between social anxiety and MD was $r_{25.1}$=.19, p<.01. Taken together, these data suggest that childhood trauma and social anxiety may be independent risk factors for MD and that absorption and addiction to fantasy are important mediating variables. To test this model further, we first conducted a linear regression analysis of the relationship between MD and our independent variables (Table 3) and then a stepwise regression. Both statistical analyses exhibited similar results.

Absorption and addiction to fantasy alone explained 65% of MD variance, $F(4,310)$=151.35, p<.001. Without the effects of absorption and addiction to fantasy, childhood trauma and social anxiety made no significant contribution in explaining MD variance.

To confirm the mediation model implied by Tables 1-3, we examined the conjoint relations among the model's independent variables (childhood trauma and social anxiety), the mediating variables (absorption and addiction to fantasy) and the dependent variable (MD). The classic Sobel test [25] does not permit the examination of a model that contains two mediators. Hence, we used SEM. Figure 1 depicts the best mediating model.

As hypothesized, two potential pathogenic mediated trajectories were demonstrated, one for each independent variable:

1) The childhood trauma pathway to MD was strongly mediated by absorption and by fantasy addiction.

2) The social anxiety pathway to MD was strongly mediated by fantasy addition. As predicted, absorption did not mediate the relationship between social anxiety and MD.

We also tested the possibility of partial mediation. Using the same model, we added direct links between childhood trauma and MD and between social anxiety and MD. This expanded model

Table 1: Pearson correlation matrix for the study variables.

	Variables	1	2	3	4	5
1	Childhood trauma	---				
2	Social anxiety	0.3**	---			
3	Absorption	0.26**	0.15**	---		
4	Fantasy addiction	0.25**	0.3**	0.35**	---	
5	MD	0.24**	0.25**	0.64**	0.69**	---

Note: ** p<.01

Table 2: Partial correlations matrix between the study variables.

	Variables	1	2	3	4	5
1	Childhood trauma	---				
2	Social anxiety	0.24**	---			
3	Absorption	0.16**	-0.02	---		
4	Fantasy addiction	0.1	0.15**	-0.18**	---	
5	MD	-0.03	0.04	0.58**	0.64**	---

Note: ** p<.01

Table 3: A linear regression analysis (enter method) of the relationship between MD and the independent variables.

	B	SD	β	t	R²
Constant	-1.69	3.9	---	-0.43	0.66
Childhood trauma	-0.04	0.08	-0.02	-0.48	
Social anxiety	0.05	0.08	0.02	0.66	
Absorption	5.79	0.46	0.45**	12.44**	
Fantasy addiction	5.07	0.35	0.54**	14.63**	

Note: B = unstandardized regression coefficient; SD = standard deviation; β=standardized regression coefficient.
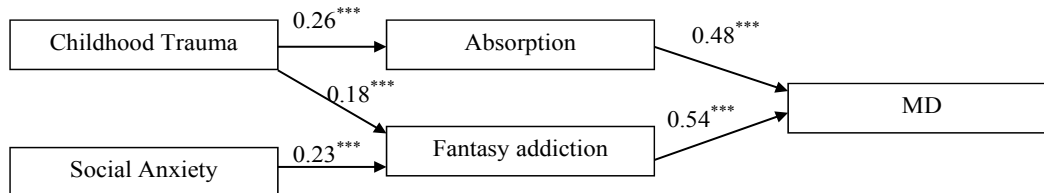** p < .01

Figure 1: Mediatifonal pathways to MD[1].

Note: *N*=315, χ^2(df=3)=2.387, *P*=0.496. *RMSEA*=0.000, *NFI*=0.995, *IFI*=1.000

[***] p<.001

[1]The model is statistically significant given the correlation between childhood trauma and social anxiety (*r*=0.3) and the correlation between absorption and fantasy addiction (*r*=0.3). In an attempt to clarify the relationship between absorption and fantasy addiction, we also examined whether absorption moderated the relationship between childhood trauma and fantasy addiction but discovered the new model showed only a marginally significant correlation between childhood trauma and daydreaming addiction (*P*=0.06).

was statistically less powerful (*N*=315, χ^2(*df*=1)=1.831, *P*=0.176, *RMSEA*=0.051, *NFI*=0.996, *IFI*=0.998), and the direct correlations between childhood trauma and MD (β=0.017) and between social anxiety and MD (β =0.024) were not significant.

Discussion

Our data confirm our research hypothesis and show that childhood trauma, social anxiety, absorption and addiction to fantasy are all related to MD. The data demonstrated two independent pathways to MD. One was associated with childhood trauma. However, trauma alone could not account for any significant MD variance. Absorption and the development of fantasy dependence were necessary conditions for the relationship between childhood trauma and MD. Our data also suggest a relationship between absorption and addiction to daydreaming. We determined that a separate path to MD could be associated with social anxiety. Although social anxiety was related to MD, it accounted for no significant incremental variance over absorption, fantasy addiction, and trauma. The relationship of social anxiety to MD was mediated by addiction to MD but not by absorption.

Our study provides support for a theoretical model of MD recently derived from qualitative data [5]. That model suggested that MD is based on an innate capacity for immersive daydreaming that is associated with an intense, rewarding sense of presence. Our findings shed light on a recent analysis of MDer testimonials suggesting that both a history of childhood adversity and current social isolation are important factors in the development and maintenance of MD [5]. However, our structural analysis findings seem to imply that the adversity is irrelevant once the other factors are present.

The current study reinforces past reports that MD can become difficult to control [26] and recent findings that show how yearning for fantasizing is not only a central factor in MD (8) but also experienced as an addiction [4,5]. Our data also provide support for the identified association between MD and the absorption subscale of the Dissociative Experiences Scale [16,27].

Absorption and behavioral addiction are indeed central to MD. In this study, these two factors alone accounted for 66% of MD variance. While the absorptive nature of MD is rather obvious, we feel the addictive nature of this mental activity requires further discussion. Behavioral addictions have been recognized as psychiatric diagnoses for quite a while [27]. Recently, gambling disorder was added to other addictive behaviors in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) of the American Psychiatric

Association [28]. Section III (emerging measures and models) of the DSM-5 also included a behavioral addiction named Internet Gambling Disorder. The emergence of behavioral addiction research over the last two decades has raised concern among some researchers, who claimed that theoretical and confirmatory research approaches may lead to the overpathologizing of everyday life. They suggested that what is needed is a research approach focusing on the psychological processes involved rather than a criteria-based approach [29].

This study contributes to the literature of behavioral addictions in general, and of MD in particular, by offering insight into psychological processes potentially implicated in the development of MD. However, before we discuss the emerging tentative model to explain MD, we propose that the addiction component of MD speaks to a possible link between MD and obsessive-compulsive disorder (OCD). Although no neuroimaging study that we are aware of has directly compared OCD, impulse control disorder (ICD) and substance use disorder (SUD), these psychopathologies are thought to be mediated by changes in partially overlapping neural circuits. This notion is based on results showing corticostriatal dysfunction across multiple contexts in functional neuroimaging studies of OCD, ICD and SUD [30]. It is possible that OCD, ICD and SUD share some form of behavioral disinhibition and that are all maintained by the positive reinforcement associated with reduced negative affect or with the pleasure associated with the repeated behavior.

The results of this study shed light on the complex conjoint relationship among several variables recently identified as related to MD. We suggest that the propensity for immersive fanciful imagery is a mental capacity that some people are endowed with. Our data suggest that this rewarding experience might be particularly gratifying for individuals who are motivated to distract themselves from emotional pain or loneliness. These persons may experience positive reinforcement associated with the imagined alternate reality and the decreased awareness of the pain in their waking experience. This process might also be associated with intensifying behavioral dyscontrol, resulting in compulsive fantasizing.

Although absorption in itself is considered a non-pathological form of dissociation [31], a recent study identified absorption as a powerful predictor of obsessive-compulsive symptoms [32]. This relationship may be manifested in the significant correlation we found between absorption and compulsive addictive fantasizing. Individuals who have been exposed to childhood abuse are more likely to experience dissociation (e.g., 34). We propose that those among them who are endowed with the capacity for absorptive daydreaming will tend to develop MD, possibly a pathological form of absorption.

Conclusion

We wish to acknowledge several limitations of this study. First, although there was little overlap between items in the MDS and those in the SDSF, it is possible that a portion of the relationship between these constructs is accounted for by some overlap between the constructs. However, the correlation of .69 between the two scales does not identify a redundancy. Furthermore, although the research instruments we used were valid and reliable, the data were collected among Israeli students. The generalizability of our findings should be demonstrated in research replicated in other populations as well. Second, this study implies possible developmental trajectories for MD, but this research is cross-sectional. Longitudinal methodology is best suited to explore such predictive models. This study adds to the tiny body of MD research. We hope the current study will stimulate follow-up exploration that will shed further light on this under-researched disorder.

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Author Affiliations

School of Social Work, University of Haifa, Israel