

Empathy, Emotion Regulation, and Creativity in Immersive and Maladaptive Daydreaming

Imagination, Cognition and
Personality: Consciousness in
Theory, Research, and Clinical
Practice

2020, Vol. 39(4) 358–373

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DOI: 10.1177/0276236619864277

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Abstract

Daydreaming is important for creativity and the understanding of our minds and those of others. However, some adults daydream to such an extreme degree that the behavior becomes disruptive; a condition known as maladaptive daydreaming (MD). We propose that highly immersive daydreaming is not always maladaptive, and immersive characteristics of daydreaming may benefit emotional regulation, empathy, and creativity. This study consisted of 542 participants from 56 countries recruited online from MD and other communities. Our results revealed that the maladaptive components of MD predicted higher affective empathy, poorer emotional regulation abilities, and reduced creative output. The immersive components of daydreaming predicted higher empathy for fantasy characters and poorer emotional regulation. These results suggest that the immersive and maladaptive components of MD have distinct behavioral correlates, but that any form of immersive daydreaming is not an effective emotional regulation strategy. Implications for the planning of effective treatment for MD are discussed.

Keywords

maladaptive daydreaming, immersive daydreaming, emotion regulation, empathy, creativity

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Introduction

Imagination is a highly complex and diverse human ability. Young children have a natural tendency to spontaneously engage in fantasy and make-believe play. Several research studies have demonstrated that children who engage in more fantasy-rich play, such as having an imaginary companion, show a greater understanding of the minds and emotions of others, and that such play can be useful for regulating emotions for children in stressful conditions (Davis, Meins, & Fernyhough, 2014; Giminez-Dasi, Pons, & Bender, 2016; Taylor & Carlson, 1997). Even at school age, highly imaginative children continue to engage in fantasy play and show greater emotional understanding than their less imaginative peers (Taylor, Carlson, Maring, Gerow, & Charley, 2004). However, whether this link between imagination and emotional understanding extends to adulthood is unknown, even though adults continue to engage in fantasy and imaginative thinking to varied degrees (Woolley, 1997).

Adults commonly consume fantasy and fiction by engaging in reading and watching various forms of fictional media (e.g., film and television). Some studies have sought to determine whether fiction engagement is related to emotional understanding and empathy, with mixed results (Kidd & Castano, 2013; Panero et al., 2016). A potential cause for the inconclusive findings of these studies could be attributed to the level of immersion in the fantasy material. For the purposes of the current research, immersion can be defined as the degree to which one becomes mentally involved in fictional or imaginary content. As such, a high degree of immersion in fantasy may facilitate any related emotional experience. It can be assumed that the creation of fantasy within one's own mind would intrinsically involve a higher level of immersion than externally sourced fantasy. Thus, the relationship between fantasy and emotional understanding might become clearer if the focus was on self-directed fantasy, rather than external sources.

Clinical observations and research have identified a condition in which individuals spend a significant portion of their time immersed in mental imaginings and elaborate daydreams. In maladaptive daydreaming (MD), such activity becomes so extreme that it has a negative impact on an individual's daily functioning (Somer, 2002), resulting in a debilitating condition, for which effective treatments are currently being tested. Still, the role that nonpathological immersive daydreaming plays in emotional understanding remains unknown. It is important to note that immersive and maladaptive daydreaming, as defined here, represents a mental activity which involves a high degree of focus and structure. Thus, it is distinct from the mental activity of "*mind-wandering*," which is an unfocused and unstructured "*drifting*" of the mind (Mason et al., 2007). Investigations into MD have included reports that fantasizing allows individuals to access emotions and experiences that they lack in real life, which they believe is related to greater understanding of emotions and empathic

ability due to the ability to imagine the situations of others with ease (Bigelsen & Schupak, 2011).

Immersive Daydreaming and Empathy

Empathy is a complex construct with several diverging perspectives concerning the definition and subtypes of empathy. There is a general consensus in the literature that empathy can be divided into two main types: affective empathy and cognitive empathy (Davis, 1983; Shamay-Tsoory, Aharon-Peretz, & Perry, 2009). Affective empathy refers to the ability to experience the emotions of another person, otherwise known as emotion contagion. Cognitive empathy refers to the ability to understand the perspective of another person and have a logical account of how they would feel in their situation. Davis (1980) argues that empathy cannot be measured as a single construct, and that in order to gain a complete picture of individual differences in empathy, we must assess both the cognitive and affective components this construct. Davis further breaks down the construct into four components: identification with the experience of fantasy characters from books and movies, adoption of the perspective of other people, feelings of compassion and concern for others, and feelings of distress when observing others in distressful situations.

Imaginative ability is thought to be linked to the various aspects of empathy, for instance, fiction writers score above the norm on all four components of Davis' (1980) measure of empathy (Taylor, Hodges, & Kohanyi, 2003). As such, due to the imagination involved in daydreaming, and because individuals with MD typically report their daydreaming content to be highly social and emotional (Somer, Somer, & Jopp, 2016), we would expect that those who engage in highly immersive forms of daydreaming may have a heightened capacity for empathy. In particular, the ability for immersive daydreaming would likely relate strongly to the ability to identify with fantasy characters, and possibly the other components of empathy defined by Davis (1980).

Immersive Daydreaming and Emotional Regulation

A common theme that has been identified in those with MD across multiple studies is the use of daydreaming as an escape or a way to deal with stressful life circumstances (Bigelsen & Schupak, 2011; Somer, Somer, et al., 2016). Somer (2002) identified two main functions of MD in an analysis of patient reports. These functions were "disengagement from stress and pain by mood enhancement and wish fulfilment fantasies" and "companionship, intimacy and soothing." Both of these functions were identified from reports of retreating to daydreaming aimed at managing difficult emotions and simulating otherwise unmet desires and needs. Furthermore, participants reported in both investigations by Bigelsen and Schupak (2011) and Somer, Somer, et al. (2016) that

daydreaming induces many positive emotions, including calmness, confidence, and excitement. Thus, there is evidence to suggest that immersive daydreaming may serve a function of regulating emotions. In support, guided daydreaming imagery was effective in reducing anxiety and enhancing positive emotion in an oncological sample (Frick et al., 2008). In addition, following a loneliness induction, participants who daydreamed about some significant other showed increased feelings of connection, love, and belonging compared to nonsocial daydreamers and control participants (Poerio, Totterdell, Emerson, & Miles, 2015). Furthermore, adolescents report that daydreaming during school can be a useful strategy for dealing with negative emotions and working through problems (Atli, 2016).

On the other hand, MD is often comorbid with other mental health conditions (Somer, Soffer-Dudek, & Ross, 2017) and seems to be linked to greater difficulty regulating emotion in general (Greene, West, & Somer, under review). This finding suggests that the perceived emotional benefits of this intense form of fantasy may be impermanent and ultimately ineffective for emotion regulation. Perhaps the usefulness of daydreaming for emotion regulation depends on the degree of distress and dysfunction associated with it. For instance, Greene and colleagues (under review) also reported that higher enjoyment of daydreaming was associated with higher emotional clarity. The symptoms and characteristics of MD can be divided into either immersive components, reflecting the immersive nature of the daydreaming behavior, or maladaptive components, reflecting the associated distress and dysfunction (Abu-Raya, Somer, & Meari-Amir, 2019). Reports suggest that there are some who engage in immersive daydreaming but do not experience the maladaptive symptoms (Bigelsen & Schupak, 2011). It would be interesting to determine whether the immersive and maladaptive components of MD have distinct relations to emotional regulation abilities.

Immersive Daydreaming and Creativity

Due to the high capacity for imagination required for immersive daydreaming, we posit that this activity could be related to increased general creativity and creative output. Indeed, earlier research showed that students who followed instructions to engage in imagery and daydreaming later wrote more original stories compared to students in a control condition who only engaged in reading and writing exercises (Jampole, Konopak, Readance, & Moser, 1991; Jampole, Mathews, & Konopak, 1994). A study on a related concept showed a relationship between measures of fantasy proneness and creativity (Lack, Kumar, & Arevalo, 2003). Zedelius and Schooler (2016) have suggested that creative individuals sometimes deliberately engage in daydreaming, because they believe their daydreams to be a source of inspiration. Their claim was partially based on findings showing that intentional daydreaming is a factor that moderates the

relationship between daydreaming and creativity (e.g., McMillan, Kaufman, & Singer, 2013).

Current Study

This study focused on those with the tendency to engage in highly immersive daydreaming, aiming at the identification of overlaps and distinctions between the immersive and maladaptive components of MD with regard to empathy, emotion regulation, and creativity. We expected that higher degrees of MD, reflected in both the immersive and maladaptive components, would be associated with higher levels of various aspects of empathy, particularly empathy in a fantasy context. We also expected that the maladaptive component of MD would be related to greater difficulty in emotion regulation, but that the immersive component would be related to better emotion regulation. Finally, we hypothesized that higher degrees of immersive daydreaming would predict higher creative output in other domains.

Method

Participants

Participants were recruited via online advertisements on forums and websites related to MD, through word of mouth, and social media. The sample consisted of 542 participants (416 females, 82 males, and 44 others). Participants indicated their age category: 169 were under 20 years, 254 between 20 and 30 years, 71 between 30 and 40 years, 34 between 40 and 50 years, and 13 were over 50 years. The average years of education was 14.30 ($SD = 3.50$), and 216 participants (40%) reported having been diagnosed with another mental health condition. A total of 56 different countries were represented in the sample, with the majority of participants located in North America (48.5%) and Europe/UK (30.6%). Respondents were required to be fluent English speakers. Participants were informed prior to commencing the survey that their consent to participate is implied by proceeding with the survey, and ethical clearance for the study was received from the Institutional Review Board at the University of Haifa.

Measures

Demographic information. Participants indicated their age category, gender, years of education, country of residence, English speaking status, and the existence of a concurrent psychiatric diagnosis and, if so, whether medication was taken to treat the condition.

The 16-item Maladaptive Daydreaming Scale. The Maladaptive Daydreaming Scale (MDS; Somer, Lehrfeld, Bigelsen, & Jopp, 2016) was developed to determine

the extent to which an individual experiences MD. The MDS originally included 14 items which measured MD behavior on three subscales, including yearning (e.g., “When you first wake up in the morning, how strong has your urge been to immediately start daydreaming”), kinesthesia (e.g., “How often are your current daydreams accompanied by physical activity such as pacing, swinging or shaking your hands?”), and impairment (e.g., “When you know you have something important or challenging to pay attention to or finish, how difficult was it for you to stay on task and complete the goal without daydreaming?”). Based on consistent reporting by self-identifying maladaptive daydreamers on the importance of music in their daydreaming behaviors, two items were added to the MDS (MDS-16; Somer, Soffer-Dudek, Ross, & Halpern, 2017) related to music use (e.g., “Some people notice that certain music can trigger their daydreaming. To what extent does music activate your daydreaming?”). A factor structure analysis of the MDS-16 has revealed two overarching factors: “immersive daydreaming,” which includes items pertaining to the immersive captivating quality of the daydreaming (items 1, 2, 3, 4, 12, 13, 14, 15, 16) and “distress and impairment,” which includes items describing the maladaptive aspects of the daydreaming (items 5, 6, 7, 8, 9, 10, 11; Abu-Raya et al., 2019). A confirmatory factor analysis performed by Abu-Raya and colleagues revealed excellent fit to the two-factor model, $\chi^2(103) = 89.53$, $p < .05$, and significant standardized loadings of items on each factor ($p < .001$).

Responses on the MDS-16 are indicated on a scale ranging from 0% (*never*) to 100% (*extremely frequent*), with 10% increments. Overall score is the average of all item responses, with higher scores indicating higher MD behaviors, and a cut-off score of 50 distinguishing between maladaptive daydreamers and non-maladaptive daydreamers (Somer, Soffer-Dudek, Ross, & Halpern, 2017). Criterion-related evidence for the MDS-16 was demonstrated by its high correlation, $r = .58$, $p = .01$, with the most closely related criterion measure: the Creative Experiences Questionnaire, an instrument derived from measures of fantasy proneness (Merckelbach, Harselenbergm, & Muris, 2001; see later). Somer, Soffer-Dudek, Ross, & Halpern, (2017) also reported that the MDS-16 discriminated well between self-identified individuals with and without MD and demonstrated solid internal consistency and temporal stability (test–retest reliability, $r = .92$). The MDS has previously shown excellent sensitivity (95%) and high specificity (89%) levels. Internal consistency in this study was excellent ($\alpha = .90$).

Interpersonal Reactivity Index. The Interpersonal Reactivity Index (IRI; Davis, 1980) consists of 28 items designed to measure various components of empathy. The IRI consists of four subscales, including perspective taking (e.g., “I try to look at everybody’s side of a disagreement before I make a decision”), fantasy (e.g., “I get really involved with the feelings of the characters in a novel”), empathic concern (e.g., “I often have tender, concerned feelings for people less fortunate than me”), and personal distress (e.g., “In emergency situations,

I feel apprehensive and ill-at-ease”). Responses are indicated on a 5-point Likert-type scale ranging from A (*does not describe me well*) to E (*describes me very well*). Higher scores indicate higher empathic ability, with eight items reverse scored. The IRI is a widely used measure, showing strong reliability and validity in several investigations with several translated versions (e.g., Gilet, Mella, Studer, Gruhn, & Labouvie-Vief, 2012; Siu & Shek, 2005; Sze, Gyurak, Goodkind, & Levenson, 2011). The IRI demonstrated very good internal consistency in this study ($\alpha = .81$).

Difficulties in Emotion Regulation Scale. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) consists of 36 items designed to measure emotion regulation abilities. The DERS consists of six subscales, including non-acceptance of emotional responses (e.g., “When I am upset, I become angry with myself for feeling that way”), difficulty engaging in goal-directed behavior (e.g., “When I am upset, I have difficulty getting work done”), impulse control difficulties (e.g., “I experience my emotions as overwhelming and out of control”), lack of emotional awareness (e.g., “I pay attention to how I feel”; reverse scored), limited access to emotion regulation strategies (e.g., “When I am upset, I believe I will remain that way for a long time”), and lack of emotional clarity (e.g., “I have no idea how I am feeling”). Responses are indicated on a 5-point Likert-type scale (1 = *almost never*; 5 = *almost always*), and 11 items are reverse scored. Higher scores on the DERS indicate greater difficulty with emotion regulation. The DERS has demonstrated high internal consistency ($\alpha = .93$), test–retest reliability ($r = .88$), and correlations with other measures of emotion regulation (Gratz & Roemer, 2004). In this study, the DERS demonstrated excellent internal consistency ($\alpha = .94$).

Biographical Inventory of Creative Behaviors. The Biographical Inventory of Creative Behaviors (BICB; Batey, 2007) measures creative behaviors by asking respondents to indicate which of 34 activities (e.g., “Written a short story”) they have been involved in during the past 12 months. The sum of activities that participants indicate having been involved in is calculated, and higher scores indicate more creative behaviors. The BICB has demonstrated high internal consistency ($\alpha = .89$; Silvia, Wigert, Reiter-Palmon, & Kaufman, 2012) and correlations with other measures of creativity, including divergent thinking and openness to experience (Batey, Furnham, & Safiullina, 2010). Internal consistency of the BICB in this study was good ($\alpha = .81$).

Results

To distinguish between immersive and maladaptive components, and the relation of each component with other measures, the “immersive daydreaming” and “distress and impairment” factors of the MDS-16, identified by Abu-Raya et al.

(2019), were analyzed as separate scales. Similarly, the IRI subscales were analyzed separately to determine associations between immersive and MD with particular components of empathy, as defined by Davis (1980). Thus, the variables included in the initial correlation analysis were MDS-16 total, MDS-immersion, MDS-maladaptation, IRI-perspective taking, IRI-fantasy, IRI-empathic concern, IRI-personal distress, DERS, and BICB scores.

Correlations

Overall associations between all variables were investigated using a partial correlation analysis, controlling for age, gender, and mental health status. Correlations are shown in Table 1. Of particular note, the total MDS-16 score and both the MDS-immersion and MDS-maladaptation factors were positively associated with the IRI-fantasy and personal distress scales, positively associated with the DERS, and negatively associated with BICB scores. Thus, these associations warranted further investigation.

Multiple Regressions

A series of multiple hierarchical regression analyses were conducted to determine the degree to which each factor of the MDS-16 predicted scores on associated variables while controlling for age, gender, and mental health status. The enter method was used for each model, with age, gender, and mental health status entered in the first stage, followed by the MDS-immersion and MDS-maladaptation variables.

In line with our hypothesis, our data show that the two MDS-16 scales explained a significant portion of the variance in IRI-fantasy scores, beyond the variance explained by age, gender, and mental health status, $F(5, 534) = 7.25$, $p < .001$, R^2 change = .05, $f^2 = .05$. Further analysis revealed that while scores on the MDS-immersion scale positively predicted scores on the IRI-fantasy scale, $\beta = .25$, $t(539) = 4.33$, $p < .001$, scores on the MDS-maladaptation scale were not predictive of IRI-fantasy scores, $\beta = -.03$, $t(539) = 0.51$, $p = .609$. In other words, immersive (but not maladaptive) daydreaming was associated with the respondents' tendencies to transpose themselves imaginatively into the feelings and actions of fictitious characters in books, movies, and plays.

We also found that the MDS-16 scales explained a portion of the variance in IRI-personal distress scores, beyond the variance explained by age, gender, and mental health status, $F(5, 534) = 8.95$, $p < .001$, R^2 change = .04, $f^2 = .04$. Scores on the MDS-immersion scale did not predict scores on the IRI-personal distress scale, $\beta = .07$, $t(539) = 1.20$, $p = .230$, whereas scores on the MDS-maladaptation scale positively predicted IRI-personal distress scores, $\beta = .16$, $t(539) = 2.94$, $p < .01$, indicating that the maladaptive nature of daydreaming was related to self-oriented feelings of personal anxiety and unease in tense interpersonal settings.

Table 1. Correlations (*r* Value) Between Scores on the MDS-16, the Immersive Factor (MDS-Immersion) and the Maladaptive Factor (MDS-Maladaptation), Each Subscale of the IRI-PT, IRI-F, IRI-EC, and IRI-PD, DERS, and BICB, Controlling for Age, Gender, and Mental Health Status.

	MDS-16	MDS-immersion	MDS-maladaptation	IRI-PT	IRI-F	IRI-EC	IRI-PD	DERS	BICB
MDS-16	—	0.90***a	0.92***a	0.02	0.19***b	0.06	0.21***c	0.41***a	-0.14***b
MDS-immersion		—	0.65***a	0.03	0.22***c	0.07	0.17***b	0.35***c	-0.10***b
MDS-maladaptation			—	0.01	0.13***b	0.04	0.21***c	0.39***c	-0.15***b
IRI-PT				—	0.16***b	0.36***c	-0.08	-0.15***b	0.14***b
IRI-F					—	0.25***c	0.12***b	0.13***b	0.13***b
IRI-EC						—	0.18***b	0.10***b	-0.03
IRI-PD							—	0.45***a	-0.28***c
DERS								—	-0.11***b
BICB									—

MDS-16 = Maladaptive Daydreaming Scale-16; IRI-PT = Interpersonal Reactivity Index-Perspective Taking; IRI-F = Interpersonal Reactivity Index-Fantasy; IRI-EC = Interpersonal Reactivity Index-Empathic Concern; IRI-PD = Interpersonal Reactivity Index-Personal Distress; DERS = the Difficulties in Emotion Regulation Scale; BICB = the Biographical Inventory of Creative Behaviors.

^aLarge effect size.
^bSmall effect size.
^cMedium effect size.
* $p \leq .05$. ** $p \leq .005$. *** $p \leq .001$.

The findings of this study also indicate that the MDS-16 scales explained a portion of the variance in DERS scores, beyond the variance explained by age, gender, and mental health status, $F(5, 534) = 31.04$, $p < .001$, R^2 change = .16, $f^2 = .19$. Contrary to our prediction, we found no evidence that immersive daydreaming is related to better emotional regulation. Scores on both the MDS-immersion and MDS-maladaptation scales positively predicted DERS scores, $\beta = .17$, $t(539) = 3.20$, $p = .001$; $\beta = .28$, $t(539) = 5.53$, $p < .001$, respectively, suggesting that immersive daydreaming as a whole, regardless of its level of maladaptation, is associated with poorer emotional regulation.

We also found that MDS-16 scores explained a portion of the variance in BICB scores, albeit the small effect size, $F(5, 534) = 3.60$, $p < .01$, R^2 change = .02, $f^2 = .02$. The analysis determined that while scores on the MDS-immersion scale did not predict scores on the BICB, $\beta = -.01$, $t(539) = 0.20$, $p = .839$, scores on the MDS-maladaptation scale did negatively predict BICB scores, $\beta = -.14$, $t(539) = 2.47$, $p < .01$, showing that, contrary to our prediction, immersive daydreaming has no significant impact on creative output. Furthermore, our results suggest that maladaptive aspects of this form of daydreaming may actually compromise creative output.

Discussion

This study explored the degree to which the immersive and maladaptive components of MD separately predicted measures of empathy, difficulties in emotion regulation, and creative output. Each hypothesis will be explored in the following discussion.

Empathy

We hypothesized that both immersion and maladaptation in daydreaming would predict higher levels of various aspects of empathy, particularly empathy for fantasy characters. This hypothesis was partially supported, such that daydreaming was indeed associated not only with empathy for fantasy characters, but also with empathy involving feeling personal distress when others are in distress. Specifically, the immersive component predicted empathy for fantasy characters, and the maladaptive component predicted personal distress. However, our findings show no associations between daydreaming and empathic concern for others or perspective taking ability. Although our findings are, generally, in line with research suggesting that greater absorption in fantasy is related to a heightened ability to imagine the experiences of others and empathize more strongly with them (Taylor et al., 2003, 2004; Wickramasekera & Szlyk, 2003), it seems that enhanced empathic ability is associated with immersive daydreaming only if it pertains to a fictional context. It is possible that the understanding of another's mind and emotions in real life requires distinct skills from such understanding in

fantasy. Many psychiatric conditions, including (but not limited to) antisocial, borderline and narcissistic personality disorders, autistic spectrum disorders, and alexithymia are associated with deficits or even lack of empathy (Decety & Moriguchi, 2007). It is, therefore, also plausible that comorbid psychopathology experienced by most individuals with MD (Somer, Soffer-Dudek, & Ross, 2017) impedes empathic abilities in real life.

MD is highly comorbid with depressive disorders (Somer, Soffer-Dudek & Ross, 2017). Thus, our findings are also consistent with data showing that people with depression have repeatedly scored higher than healthy control groups on the personal distress subscale of the IRI (Schreiter, Pijnenborg, & Aan Het Rot, 2013). It is possible that there is an interaction between the development of MD and personal distress, such that individuals who feel more personal distress in combination with other life circumstances (such as loneliness) may be more likely to engage in immersive daydreaming to maladaptive degrees, and in turn the daydreaming in combination with the negative symptoms of MD may increase their vulnerability to the distress of others (Davis et al., 2014; Giminez-Dasi et al., 2016; Taylor & Carlson, 1997).

Considering Davis's (1983) distinction between affective and cognitive empathy, it seems that the maladaptive symptoms of MD specifically relate to higher affective empathy, which could contribute to feelings of distress and poor emotional regulation. Indeed, higher affective empathy has been found previously to be related to heightened emotional vulnerability (Davis, 1983; Harari, Shamay-Tsoory, Ravid, & Levkovitz, 2010). Moreover, a study by Davis, Hull, Young, and Warren (1987) showed that those with higher affective empathy had more negative emotional reactions to films, whereas those with higher cognitive empathy had more positive reactions. The link between MD and personal distress appears to be attributed to the maladaptive components of MD, as immersive daydreaming itself did not predict personal distress. Hence, this result further warrants the need for interventions to focus on the maladaptive components of immersive daydreaming, such as the irresistible compulsion to daydream and the resultant impaired functioning and concomitant distress.

Emotional Regulation

We expected that while the maladaptive component of MD would predict greater difficulty in emotional regulation, the immersive component would predict better emotional regulation. This prediction was partially supported, such that maladaptive symptoms significantly predicted poorer emotional regulation abilities. However, contrary to expectations, the immersive component also predicted poorer emotional regulation abilities, although slightly less so than MD. This result is in line with current investigations linking MD with emotional regulation difficulties (Greene et al., under review) and reports that individuals with MD often experience difficulties managing problematic emotions and use their

daydreaming as a fleeting escape (Bigelsen & Schupak, 2011; Somer, 2002; Somer, Somer et al., 2016). The tendency to flee into an inner alternate reality was shown to be followed by an array of psychological difficulties and characterized by a plethora of comorbid psychiatric disorders (Soffer-Dudek & Somer, 2018; Somer, Soffer-Dudek, & Ross, 2017). It seems likely that any form of immersive daydreaming may provide temporary relief from difficult emotions, but ultimately it is not an effective strategy for managing emotional difficulties. Our data imply that effective emotional regulation techniques should be a central component of MD interventions.

Creativity

Our data rendered no support to the hypothesis that immersive daydreaming would be associated with higher creative output. Instead, we found that maladaptation in daydreaming predicted lower scores on the creativity measure, and that the immersive factor did not predict creativity scores in either direction. There is no doubt that immersive forms of daydreaming recruit imaginative and creative skills. However, the current results could be attributed to the particular measurement of creativity used. The BICB measures the output of creative behaviors (i.e., things that are produced from creative engagement such as writing a story, drawing, or sculpting), rather than determining creative ability or capacity. It is likely that those with MD scored low on this measure due to the large amounts of nonproductive time spent absorbed in their daydreaming. One of the defining features of MD is a difficulty with focusing on daily tasks and completing goals (Somer, Lehrfeld, et al., 2016). Thus, individuals with MD may have high creative ability, but may not be able to produce the types of outputs measured in the BICB, due to their preoccupation with daydreaming. Reduced creative output can be attributed to the maladaptive components of MD specifically, rather than the immersive components. Previous research which has shown links between daydreaming and creativity has focused on either immediate creative behaviors (e.g., having participants complete a creative task) or selectively recruiting individuals with high creative outputs and asking about their daydreaming (Jampole et al., 1991, 1994; Lack et al., 2003; Zedelius & Schooler, 2016). Future MD research should include measures of creative ability, such as divergent thinking tasks (e.g., Guilford, 1971), rather than using measures of creative output.

Two caveats limit the interpretation of our findings. Although we used statistical prediction procedures, given the cross-sectional method employed, causation cannot be inferred from our data. In addition, this research is limited by the self-report nature of our data. Future research should involve a longitudinal design and include objective measures of empathy and creativity. A further consideration to explore in future is to consider the role of specific mental health diagnoses that are commonly comorbid with MD, such as depression or attention deficit hyperactivity disorder. Although this study accounted for

general self-reported mental health diagnoses, more specific and objective diagnostic information would help validate the finding that variance in the scales is not due to other mental health concerns.

Conclusion

Overall, this study showed that the maladaptive components of MD are associated with aggravated personal distress for others, poorer emotional regulation, and reduced creative behaviors. Although the immersive components of MD were related to higher degrees of empathy for fantasy characters, they too were associated with poorer emotional regulation. While those with MD experience both the maladaptive and the immersive components of the experience, some individuals can engage in immersive daydreaming without maladaptive components. Our data suggest that immersive daydreaming with maladaptation would not be associated with the increased personal distress and reduced creative output that is associated with MD. Thus, rather than focusing on the immersive qualities of the daydreaming, treatments for MD should focus on addressing the maladaptive components: the difficulty in controlling the daydreaming, the adverse impacts of the compulsion to daydream on completion of basic chores, and MD's interference with achieving life goals (Abu-Raya et al., 2019). Apparently, immersive daydreaming is not an effective emotional regulation strategy. Immersive daydreamers (maladaptive or not) who escape to their inner worlds to mitigate their emotional distress are likely to benefit from learning alternative techniques for emotional regulation.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

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