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Daydreaming and psychopathology in adolescence: An exploratory study

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Abstract

Aim: Daydreaming is a cognitive phenomenon characterized by the redirection of attention from the external world to inner representations. Although serving several adaptive functions, excessive daydreaming has been related to emotional problems and poor psychosocial adjustment. During adolescence, this phenomenon has been scarcely explored as potential psychopathological correlate.

This study aims to explore daydreaming frequency and association with psychopathological symptoms in a non-referred population.

Methods: Participants were adolescents from a community sample ($N = 251$). Daydreaming was assessed through the Daydreaming Frequency Scale (DDFS). Youth Self-Report (YSR) and Strength and Difficulties Questionnaire (SDQ) were used as self-reports to evaluate psychopathological problems and adaptive functioning.

Results: Excessive daydreaming was present in 12.7% of participants. DDFS scores were significantly elevated in respondents with clinical scores for internalizing, depressive, obsessive–compulsive, and post-traumatic stress problems. Symptom severity correlated positively with the DDFS. Higher daydreaming was also associated with emotional symptoms, conduct problems and total difficulties on the SDQ.

Conclusions: Adolescents who daydream show increased depressive, obsessive–compulsive, and post-traumatic stress symptoms. Possible cognitive processes at play in the relationship between daydreaming and psychopathology are discussed. Daydreaming may represent a silent psychopathological index that deserves better recognition in the clinical practice and in mental health initiatives for adolescents.

KEYWORDS
adolescence, daydreaming, depression, psychopathology, trauma

1 | INTRODUCTION

Human conscious experience drifts frequently from ongoing events in the outer world to one's own thoughts and inner representations. Variably termed as daydreaming or mind-wandering, this process is ubiquitous and represents up to 50% of the individual's reflective activity (Killingsworth & Gilbert, 2010; Singer, 1966a; Singer, 1966b). The concept of daydreaming owes a substantial heritage to Jerome Singer (Singer, 1975) who produced key insights on this essential mentation. Over more recent decades, different names—such as mind

wandering, self-generated thought, spontaneous thought—have been assigned to cognitions arising through the shift of attention from ongoing events to more unconstrained reflections and imagery (Baird et al., 2012; Christoff et al., 2016; Fox et al., 2018; Smallwood & Schooler, 2015). A common core feature of such constructs is their independence from perceptual stimuli (Antrobus et al., 1966; Teasdale et al., 1995) and the unrelatedness with the activity being performed in a given moment (Smallwood & Schooler, 2015). For the sake of clarity, daydreaming is used in this paper as an umbrella term encompassing all different types of off-task thoughts, that can be either more realistic (e.g., holiday planning, mental replays of past events) or fanciful (e.g., immersive phantasy worlds with invented characters).

Daydreaming may be important for several adaptive functions such as creative thinking, finding meaning in personal experiences or planning future activities (Stawarczyk et al., 2012). However, when recurrent and time-consuming, it may be underpinned by negative emotional states and depression (Marchetti et al., 2016; Poerio et al., 2013; Webb et al., 2021). Some authors have also focused on cognitive control as key to separate normative from dysfunctional forms (Seli et al., 2013, 2015) and several studies have indicated that unintentional daydreaming is more frequent in individuals with poor executive functioning, influencing their ability to remain on task and address upcoming goals (Kane et al., 2007; McVay & Kane, 2009). In some cases, daydreaming may even be an intrusive and hardly controllable phenomenon which replaces real-life interactions, a condition conceptualized as 'maladaptive daydreaming' by Somer (2002). Maladaptive daydreaming differs from daydreaming due to a higher level of unrealistic content, elevated recurrence, difficulties in controlling the episodes and higher risk of affecting life goals (Bigelsen et al., 2016) and is also often accompanied by kinesthetic activity (Bigelsen & Schupak, 2011). The importance of content has been repeatedly emphasized by several studies (Mar et al., 2012; Smallwood & Andrews-Hanna, 2013). On one hand, thoughts on one's current problems or internal dialogues with real-life significant others may associate with positive outcomes and represent coping strategies against stressful situations (Baird et al., 2012; Poerio et al., 2015). On the other, repetitive negative thoughts (i.e., negative rumination) have detrimental effects on wellbeing and typically appear elevated in individuals with depression and anxiety (Nolen-Hoeksema, 2000; Watkins, 2008). Thus, frequency, intentionality and content may be relevant factors to define the functional meaning of daydreaming episodes.

Of all ages of life, adolescence may well represent the best-suited one to investigate daydreaming because its frequency and intensity both tend to decline gradually into adulthood (Giambra, 1979, 2000). Adolescence is also a critical age for psychopathology and peak age of onset of many psychiatric disorders (Giedd et al., 2008). Studies on psychopathological factors have pointed out a role for childhood trauma and social anxiety in dysfunctional daydreaming (Somer et al., 2016a; Somer & Herscu, 2017). Obsessive–compulsive traits and propensity to behavioural addictions have also been involved (Soffer-Dudek & Somer, 2018; Somer et al., 2016b). However, to date, very little is known on daydreaming during adolescence and whether higher frequency might reflect distinct psychopathological problems.

Against this background, we aimed to investigate daydreaming in a large group of non-referred adolescents, to provide insight on prevalence and psychopathological implications in a critical age for mental health.

2 | METHODS

2.1 | Participants and procedures

Participants consisted of students recruited from a local high school in Frascati, a large hilltop town located at about 20 km from Rome city center. To ensure greater study participation, both school sections of the high school were involved, that is, 'classical' (humanities) and foreign language. Of 367 students attending the school, 30.5% were in the classical and 69.5% in the foreign language section. Students were invited to participate in the study on a voluntary basis, were clearly informed of the absence of any form of compensation prior to participation and all provided signed assent. Written informed consent was obtained from all parents/guardians in accordance with the Declaration of Helsinki. The study was approved by the institutional review board of Sapienza University and by the local school board. A survey was delivered during regular school time over two consecutive days. A brief explanation of what daydreaming is, and the aim of the study was given to each participant. Examples of daydreaming were provided, and participants were advised to make a distinction between thoughts regarding an ongoing task or event, and 'daydreaming', which involves off-task mentation. All data were coded to ensure anonymity.

2.2 | Instruments

2.2.1 | Daydreaming frequency scale (DDFS)

The DDFS is one of 28 subscales of the Imaginal Process Inventory, a 344-item questionnaire designed for an in-depth assessment of the inner mental life of individuals (Singer, 1966; Singer & Antrobus, 1963). DDFS assesses the frequency of daydreaming experiences and includes 12 items rated on a five-point Likert scale. Respondents are asked to rate frequency of daydreaming experiences in their daily life. All DDFS items have an ordinal presentation, that is, ranging from lower to higher frequencies ('A'–'E' response options). Each response option is assigned a 0–4 score with a total maximum score of 48. The DDFS has no validated cut-off since the frequency distribution of daydreaming has not been investigated yet in the general population. Higher number of 'D' or 'E' responses (which correspond to 3 or 4 points, respectively) identify daily or very frequent daydreaming episodes. Therefore, we suggest that total scores above 36—corresponding to values above 75% of the maximum value—may be indicative of excessive daydreaming. The Italian version of the

DDFS was developed from the original English version (Giambra, 1993) using back-translation methodology (e.g., Guillemin et al., 1993). DDFS items were first translated into Italian by two of the authors (Martina Martinelli and Sofia Di Noia). Then, a bilingual research assistant translated the Italian version back into English. Following this step, the original and the back-translated versions of the DDFS were compared. Differences between the two versions were discussed among all translators until a satisfactory agreement on language equivalence was reached, to then modify the Italian version accordingly. Good psychometric properties were observed from the original Imaginal Process Inventory, with exploratory factor analysis revealing that each of the 12 DDFS items loaded on a single exclusive factor with minimum values of 0.50 (Giambra, 1980). In the original validation study, the DDFS scale showed strong internal consistency (Cronbach's alpha = 0.91) and a test–retest reliability of 0.76 for time intervals of 1 year or less between administrations (Giambra, 1993). In the present study, Cronbach's alpha was 0.89.

2.2.2 | Youth Self-Report (YSR)

The YSR is a self-report scale validated for youth aged 11–18 years (Achenbach, 1991) and widely used to assess social functioning, behavioural problems and DSM-IV-oriented symptoms. The YSR is organized in two main parts, Social Competence and Problem Checklist, from which Total Competence and Total Problems scales are derived. Problem Checklist includes eight different core scales, that is, anxious/depressed, withdrawn/depressed, and somatic complaints, which compose the internalizing scale; rule-breaking behaviour and aggressive behaviour, which form the externalizing scale; social problems, thought problems and attention problems, which are labelled as neither internalizing nor externalizing. The 2001 revision also added six DSM-oriented scales consistent with DSM diagnostic categories: affective problems, anxiety problems, somatic problems, ADHD, oppositional defiant problems and conduct problems. Scoring was provided by a computerized scoring program, which develops T-scores for all subscales. Clinical cut-offs according to T-score are set as 65–69 (borderline) and ≥70 (clinical).

2.2.3 | Strength and difficulties questionnaire (SDQ)

The SDQ is another self-report measure for youth aged 11–17 years (Goodman et al., 1998) which is used to screen for emotional and behavioural problems according to five scales (conduct problems, hyperactivity, emotional symptoms, peer problems and pro-social behaviours). Each scale has a score range of 0–10, resulting in a total difficulty score of 0–40, while the pro-social behaviour scale does not account for difficulties and therefore is not summed in the total score. Clinical scores are defined according to cut-off values (total difficulties score ≥20; conduct problems >5; hyperactivity >7; emotional symptoms >7; peer problems >7; prosocial behaviours ≤4).

2.3 | Statistical analysis

Statistical analyses were performed using Stata Statistical Software Release 8.0 (Stata Corporation; College Station, TX). Quantitative variables are summarized by means and standard deviations (SD) and categorical variables by absolute frequencies and percentages. Differences among groups with respect to categorical variables were analysed by means of chi-squared test (or Fisher's exact probability test when requirements for chi-squared test were unmet). YSR and SDQ scores were analysed either as quantitative or categorical variables, in the latter case after dividing the sample into subgroups based on each scale's score category, that is, clinical versus non-clinical. We also used age as a quantitative or categorical variable (<16 years vs. ≥16 years).

When considering quantitative outcomes, differences between groups were evaluated either with Student's t test (for two groups) or factorial analysis of variance (ANOVA) when comparing subgroups based on the combination of two or more grouping factors (namely, clinical vs non-clinical scores at YSR or SDQ, sex and age). Relevance of difference between groups was evaluated with Cohen's d effect size. Number of respondents belonging to each subgroup of the YSR and SDQ score categories (clinical/non-clinical), and age (<16 vs. ≥16 years) could not be pre-determined and varied across grouping variables. Therefore, for each partition, we computed the power of the test at a 5% two-tailed significance level and for an effect size from medium to large (Cohen's $d = 0.80$). At these conditions, for most comparisons between subgroups based on YSR and SDQ score categories, gender, school section and age, the power was quite satisfactory ranging from 0.916 to 0.999. On the contrary, the power fell to 0.768 for YSR-Social problems and YSR-Aggressive conduct, and to 0.695 for YSR-Thought problems, for which the proportion of respondents with clinical score was lower than 5%. Correlations between quantitative variables were estimated with Pearson's linear correlation coefficient. The YSR and SDQ scores, whose linear correlation with the DDFS total score in the entire sample was $r > 0.30$, were included in a multiple linear regression model together with sex and age of the respondent, to assess their specific effect on DDFS total score taking into account all other variables included in the model. The variance inflation factor (VIF) was computed for any independent variable included in the regression model. All the independent variables included had a VIF value <2.6, thus suggesting the absence of multicollinearity.

3 | RESULTS

A total of 257 of students participated in the study. Six participants were excluded due to missing data. The final sample included 251 students of whom 25.1% males (n = 63; 15.92 ± 0.85 years [mean ± standard deviation]) and 74.9% females (n = 188, 15.86 ± 0.99 years).

Table 1 shows the distribution of DDFS values across the entire sample and in subgroups according to gender, age and school section. Excessive daydreaming as computed by DDFS scores above 75% of

	n	Mean	(SD)	Student t p	Effect size Cohen's d
Overall group	251	23.88	(9.13)		
Sex					
Males	63	21.98	(8.83)	0.057	0.278
Females	188	24.51	(9.17)		
Age					
<16 yr	140	24.25	(9.49)	0.468	0.092
≥16 yr	111	23.41	(8.68)		
School section					
Classical	71	22.55	(9.22)	0.149	0.203
Foreign language	180	24.40	(9.07)		

TABLE 1 DDFS scores: means and standard deviations (SD) between age, sex and school sections

TABLE 2 Statistically significant comparisons of DDFS total score between subjects with non-clinical and clinical scores on the YSR and SDQ, accounting for sex and age

	Subjects with non-clinical scores mean (SD) n	Subjects with clinical scores mean (SD) n	ANOVA non-clinical versus clinical p value	Effect size Cohen's d
YSR				
Anxious/depressed	22.86 (9.00) 208	28.79 (8.20) 43	0.001	0.672
Aggressive behaviour	23.59 (9.12) 239	29.67 (7.70) 12	0.045	0.683
Internalizing broad band score	22.22 (9.09) 175	27.68 (8.09) 76	<0.001	0.625
Total problems score	22.63 (8.74) 204	29.30 (8.91) 47	<0.001	0.770
Obsessive–compulsive problems	22.90 (8.76) 220	30.81 (8.83) 31	<0.001	0.906
Post-traumatic stress problems	23.30 (9.03) 229	29.91 (8.14) 22	0.002	0.741
Affective problems	23.16 (9.01) 226	30.36 (7.74) 25	0.019	0.810
Anxiety problems	23.17 (9.04) 203	26.88 (8.99) 48	0.006	0.415
SDQ				
Emotional symptoms	22.67 (8.75) 173	29.42 (8.71) 45	0.013	0.767
Conduct problems	23.21 (8.94) 191	30.11 (8.39) 27	0.001	0.787
Total difficulties	23.11 (8.85) 199	34.05 (5.55) 19	0.002	1.274

Note: SDs in subjects with non-clinical and in subjects with clinical scores, separately, were computed pooling variability of the 4 subgroups based on sex-by-age combination. The italic values represent number of participants.
Abbreviations: n, number of participants; SD, standard deviation; SDQ, Strength and Difficulties Questionnaire; YSR, youth self-report.

the maximum value, was present in 12.7% of the sample (32 respondents out of 252). DDFS score analysis revealed a trend for higher scores in females compared to males, while there was no statistically significant difference between school sections or between younger and older adolescents.

YSR ratings showed significantly higher scores for females in the DSM-somatic problems scale (M: 56.1 ± 6.7, F: 59.0 ± 7.9; $p = .011$), while males scored significantly higher in Social Competence (M: 45.6 ± 8.8, F: 42.5 ± 8.2; $p = .012$) and in the DSM-conduct problems scale (M: 55.2 ± 6.3, F: 53.3 ± 5.5; $p = .022$). No other difference

TABLE 3 Correlations between DDFS total score and YSR and SDQ subscales

	Pearson's r	p
YSR		
Anxious/depressed	0.373	<.001*
Withdrawn/depressed	0.218	<.001*
Somatic complaints	0.221	<.001*
Social problems	0.352	<.001*
Thought problems	0.369	<.001*
Attention problems	0.278	<.001*
Rule-breaking behaviour	0.119	.060
Aggressive behaviour	0.197	.002*
Internalizing broad band score	0.349	<.001*
Externalizing broad band score	0.213	<.001*
Total problems score	0.381	<.001*
Affective problems	0.384	<.001*
Anxiety problems	0.297	<.001*
Somatic problems	0.129	.041*
ADHD problems	0.158	.012*
Oppositional defiant problems	0.199	.002*
Conduct problems	0.085	.177
Obsessive–compulsive problems	0.331	<.001*
Post-traumatic Stress Problems	0.397	<.001*
SDQ		
Emotional symptoms	0.357	<.001*
Conduct problems	0.259	<.001*
Hyperactivity	0.245	<.001*
Peer problems	0.226	<.001*
Prosocial	0.069	.274
Total difficulties	0.418	<.001*

*Significant p value.

between males and females was detected on the remaining scales of the YSR. Furthermore, students in the foreign language section had significantly higher scores in the ADHD problems scale than those in the classical section (Classic: 54.6 ± 6.1, Foreign language: 56.4 ± 6.2; p = .045).

Regarding SDQ, females had significantly higher mean scores in the emotional problems scale (M: 3.0 ± 2.2, F: 4.8 ± 2.4; p < .001) and a trend for higher ratings in the total difficulties scale (M: 11.7 ± 5.5, F: 13.1 ± 5.0; p = .059), compared to males. We also found a statistically significant difference in the SDQ hyperactivity scale between the two sections, with higher scores in the foreign language one (Classic: 3.4 ± 2.3, Foreign language: 4.1 ± 1.9; p = .01).

When evaluating differences between subgroups of the YSR, that is, clinical/non-clinical, adjusted for sex and age (Table 2), significantly higher DDFS total score were found between groups on the anxious/depressed, aggressive behaviour, post-traumatic stress problems, obsessive–compulsive problems, internalizing problems, and total problems scales. Among the DSM-oriented scales, YSR subgroups

differed significantly in DDFS scores on the affective problem scale and anxiety problem scale. Age contributed to reduce DDFS total scores in the female clinical subgroup but not in males for the externalizing broad band scale.

As for the SDQ results, data from participants older than 18 years were excluded from the analysis since normative data are available only for ages 4–17. There were statistically significant differences between SDQ score subgroups (clinical vs non-clinical) in DDFS total scores on the emotional symptoms, conduct problems and total difficulty sections, adjusted for sex and age (Table 2).

We further analysed correlations in the total sample between DDFS total score and YSR and SDQ scores, respectively. For the independent variables affecting to the DDFS total score, the results are presented as regression coefficient (r) and significance level (p). All correlations are displayed in Table 3.

DDFS total score positively correlated with a moderate-to-strong intensity to the following YSR scales: total problems, internalizing problems, anxious/depressed, social problems, thought problems, DSM-affective problems, DSM-post-traumatic stress problems, DSM-obsessive–compulsive problems. Also, moderate-to-strong positive correlations were found between DDFS and SDQ total difficulties score and emotional symptoms, while correlations were only mild between DDFS and both the aggressive behaviour scale and SDQ conduct problems scale.

Correlations were also specifically run for those subscales of the YSR and SDQ which had shown significant differences in DDFS scores between the clinical vs non-clinical groups; to do so, the sample was analysed in subgroups according to gender and school section (Table 4).

The same pattern of correlation between DDFS, YSR and SDQ was detected when examining groups divided by gender and school section, albeit with more variable intensity ranks.

4 | DISCUSSION

In the present study we examined the relationship between daydreaming and psychopathological problems in adolescents aged 13–18 years from a non-referred population and found significant associations with (i) internalizing problems/depression/anxiety, (ii) obsessive–compulsive symptoms and (iii) post-traumatic stress. Moreover, daydreaming frequency correlated positively with symptom severity and, more generally, with the severity of emotional and socio-adaptive problems.

Adolescents from our study who described themselves as daily daydreamers reached clinical scores for depressive symptoms more often than peers with lower daydreaming recurrence. This finding, together with the positive correlational pattern between daydreaming frequency and depression, highlights that the quantitative dimension of daydreaming may be very influential in the connection of daydreaming to psychopathology. Prior research has observed the relationship between off-task thoughts and affective disorders in adult (Giambra & Traynor, 1978; Killingsworth & Gilbert, 2010) and

TABLE 4 Statistically significant correlations between DDFS total scores and YSR and SDQ subscales computed in sex and school section subgroups

		M	F	Classical section	Foreign language section
YSR					
Anxious/depressed	r	0.398	0.372	0.449	0.358
	p	.001	<.001	<.001	<.001
Social problems	r	0.270	0.391	0.407	0.333
	p	.033	<.001	<.001	<.001
Thought problems	r	0.327	0.382	0.543	0.304
	p	.009	<.001	<.001	<.001
Internalizing broad band score	r	0.333	0.351	0.456	0.308
	p	.008	<.001	<.001	<.001
Total problems score	r	0.342	0.405	0.480	0.332
	p	.006	<.001	<.001	<.001
Affective problems	r	0.257	0.414	0.488	0.349
	p	.042	<.001	<.001	<.001
Obsessive–compulsive problems	r	0.478	0.297	0.490	0.280
	p	<.001	<.001	<.001	<.001
Post-traumatic Stress Problems	r	0.361	0.421	0.486	0.367
	p	.004	<.001	<.001	<.001
SDQ					
Emotional symptoms	r	0.422	0.314	0.497	0.293
	p	<.001	<.001	<.001	<.001
Total difficulties	r	0.372	0.423	0.508	0.370
	p	.003	<.001	<.001	<.001

adolescent populations (Webb et al., 2021). Off-task thoughts have been intriguingly conceptualized as cognitions that recapitulate and maintain the cognitive repertoire of an individual (Marchetti et al., 2016). However, if repetitive, self-directed and negative, as typically observed in persons with depression (Disner et al., 2011), they may represent a vulnerability trait for mood disorders (Marchetti et al., 2016). Along this line of reasoning, a possible mechanism linking daydreaming with depressed mood may be the amplification of dominant negative cognitions such as past-focused rumination or future-focused hopelessness. Another emphasized process is the reduced mindful attention to the present typical of the daydreaming mind (Bar, 2009; Marchetti et al., 2016), which is mainly occupied with internal encoding and can therefore incur self-perpetuation bias (i.e., tendency to erroneously interpret stimuli without updating the evidence from the environment in support of that cognition) (Stawarczyk et al., 2012). However, daydreaming may not exclusively represent a predisposing factor for depressed mood but also be conceived as the result of it. For instance, daydreaming may be employed by individuals with depression as a coping method to down-regulate symptoms through the shift of attention from negative cognitions to more pleasant mental content (e.g., fantasizing about self-rewarding scenarios). Given the cross-sectional nature of our study, interpretation about how daydreaming and psychopathology may influence each other is precluded. Depressive thought amplification, self-

perpetuation bias and distress down-regulation appear as possible mediating mechanisms, which all deserve further investigation.

Our findings also uncover that excessive daydreaming was associated with obsessive–compulsive and post-traumatic stress symptoms. Proneness to dissociation might play a role in this regard. In the first publication on maladaptive daydreaming, Somer (2002) described six patients with traumatic childhood events, who were socially isolated and locked into complex phantasy worlds. A central daydreaming function proposed in that study was disengagement from stress and sorrow by fantasizing about social connectedness, attractiveness, and intimacy. Following studies have further pointed out the involvement of dissociative tendencies in the onset and persistence of maladaptive daydreaming (Soffer-Dudek & Somer, 2018; Somer et al., 2016b). One of dissociation's central features is dissociative absorption (Janet, 1920; Putnam, 1999; Van der Kolk & Van der Hart, 1989), that is, the tendency to become engaged in an internal or external stimulus to the point of obliviousness to one's surroundings (Carlson & Putnam, 1993). Although only observational, the correlation of daydreaming with post-traumatic stress in our population suggests that some forms of daydreaming might resemble dissociative absorption processes, implemented to minimize negative reactions to traumatic exposure. Proneness to become overly absorbed in a cognition is not confined to post-traumatic psychopathology. Dissociative absorption may also influence the presence of obsessive–compulsive

symptoms in daydreamers (Soffer-Dudek, 2014). This proposition is based on the concept that dissociation is no continuous event and the daydreamer's attention periodically returns to be externally-directed (Butler, 2004). When the latter occurs, the individual may doubt her/his own actions or have a sense of impaired mental control over behaviour. Such mechanism has been proposed to foster anxiety, obsessions and checking compulsions in daydreamers (Soffer-Dudek, 2014). The precise mechanism linking daydreaming with obsessive–compulsive symptoms is yet to be elucidated but excessive engagement in fantasizing and poor cognitive control over behaviour, which in turn promotes obsessive–compulsive symptoms in the attempt to substantiate reality, may be relevant to explain our findings and similar observations (Salomon-Small et al., 2021).

As per our knowledge, the present study is the first to investigate daydreaming frequency in adolescents from a community sample and to explore associations with different psychopathological problems. Our results extend previous findings by highlighting elevations of affective, obsessive–compulsive, and post-traumatic stress symptoms in adolescents with excessive daydreaming. Moreover, our findings support the notion of excessive daydreaming as an index of poor psycho-social functioning during adolescence. Overall, we point to frequency as a critical index to shed light on the connection between adolescent daydreaming and psychopathology. We also suggest that cognitive processes such as amplification of depressive thoughts, self-perpetuation biases, distress down-regulation and dissociative absorption may mediate the link between daydreaming and the observed psychopathological problems. Our study supports the need for better recognition and evaluation of daydreaming when assessing adolescent psychopathology, in order to capture early trajectories and inform treatment.

There are some important limitations of the study that bear discussion and suggest future directions of research. First, the study's cross-sectional approach allows no definitive causal claims about how daydreaming relates to the explored psychopathological symptoms. Future longitudinal research is paramount to shed light on this issue as well as studies with experimental designs (e.g., comparison between normative and clinical populations), to define if daydreaming precedes or follows psychopathology and to specify which processes are at play in their relationship. Second, the sampling of a single school population and its characteristics (mainly white, middle-class adolescents) restricts the generalizability of results. The study also relies entirely on self-report measures which may be biased and suffer from common method variance (CMV). A guaranteed anonymity for respondents, explanations regarding the absence of correct/incorrect answers and the use of data only for research purposes were implemented as preventive measures against CMV (Podsakoff et al., 2003; Steenkamp et al., 2010). Lastly, daydreaming as defined and investigated by the DDFS cannot be considered the same as maladaptive daydreaming as defined by Somer (2002). To gain more insight on such peculiar clinical disorder and on dysfunctional forms of daydreaming, future studies would benefit from the use of clinician-rated instruments (Somer et al., 2017) or measures evaluating functional impairment and perceived distress. Particularly, patient narratives on their subjective daydreaming experience or instruments tailored for qualitative inquiry—for example, assessing positive vs negative content or past- versus future-oriented daydreaming—are crucial for research advancement in this field and for clinical implications. This approach would help elucidate which content is associated to depressive, obsessive–compulsive, or post traumatic outcomes and, crucially, when this is not the case.

CONFLICT OF INTEREST

The authors of this study report no potential conflict of interest.

DATA AVAILABILITY STATEMENT

The datasets for this manuscript are not publicly available because in the consent form signed by participants, it was stated that the data are confidential and will be available only to the researchers, for the purpose of statistical analysis and publication. Requests to access the datasets should be directed to and are available from the corresponding author, Francesco Cardona: francesco.cardona@uniroma1.it, upon reasonable request.

CONSENT TO PARTICIPATE AND CONSENT FOR PUBLICATION

Participation in the study was voluntary with no monetary reimbursement. Participants' parents received detailed information on the study's aims and methodology and provided written informed consent for participation of their child and publication of research data, in accordance with the Declaration of Helsinki. After obtaining consent from parents, participants received an info sheet regarding the purposes and methodology of study and were required to express a signed assent to participate.

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