

Heightened Incidence of Depressive Symptoms in Adolescents Involved in the Arts

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Studies have shown a higher than average incidence of mental illness in adult artists. We asked whether an association between symptoms of affective disorders and the arts is found as early as adolescence, using a sample of 2,482 15- to 16-year-old adolescents. Teens involved in afterschool arts had higher depressive symptom scores than those not involved, and the association between arts involvement and depressive symptoms held only for those scoring above the median in working memory test scores. We consider reasons for these findings, including the possibility that shared cognitive vulnerabilities may underlie both the depressive symptoms and increased arts practice, and that cognitive resources (working memory) facilitate the adaptive use of these vulnerabilities.

Keywords: adolescence, depression, creativity, art, psychopathology

A higher than average incidence of psychological disorders in adult artists (visual artists, writers, musicians, actors) or creative individuals has been reported in numerous studies, for a wide range of disorders: unipolar depression (e.g., Andreasen, 1987; Ludwig, 1992, 1994; Post, 1994; Wills, 2003), bipolar disorder (e.g., Jamison, 1989; Kyaga et al., 2011; Richards, Kinney, Lunde, Benet & Merzel, 1988; Santosa et al., 2007; Simeonova, Chang, Strong & Ketter, 2005; Srivastava et al., 2010; Vellante et al., 2011), schizophrenia (Kyaga et al., 2011), “positive” schizotypy (specifically, unusual perceptual and cognitive experiences at a subclinical threshold: Burch, Pavelis, Hemsley & Corr, 2006; Nettle, 2006), attention deficit hyperactivity disorder (Simeonova et al., 2005), a suspected psychosis-related genetic polymorphism (Kéri, 2009), and substance abuse (Wills, 2003; Ludwig, 1992, 1994). Although the exact nature of the relationship between specific psychological disorders and the arts remains difficult to isolate conclusively, the majority of studies report associations between artistry and affective or thought disorders.

Associations between involvement in the arts and affective disorders have been reported in studies over several decades. Post (1994) found that almost three quarters of a sample of eminent novelists and playwrights had been treated for affective illness; Andreasen (1987) reported an 80% lifetime prevalence rate of affective disorders in a sample of writers; and Jamison (1989) found that nearly 40% of a sample of professional artists and writers had been treated for affective disorders. Richards et al.

(1988) reported that first-degree relatives of those with bipolar disorder and individuals with cyclothymia had higher scores on a lifetime creativity scale (where higher scores were achieved by those in creative professions and avocations, including the arts) compared with those without cyclothymia or affected close family members. Relatedly, Claridge and Blakey (2009) found cyclothymic and hyperthymic temperament to be a strong predictor of divergent thinking skills. Additionally, a recent study of 300,000 Swedish individuals with mental illness revealed that those with bipolar disorder were substantially more likely to have an artistic occupation than were nondisordered case controls (Kyaga et al., 2011).

The association between thought disorders and artistic creativity has received thorough examination as well. Individuals treated for schizophrenia have been reported to be overrepresented in visual arts occupations (Kyaga et al., 2011); higher positive schizotypal symptomatology has been found in visual artists compared to nonartists (Burch et al., 2006); and enhanced divergent thinking has been reported in individuals high in disorganized schizotypy (Folley & Park, 2005), to name some of the findings. It has been proposed that certain cognitive vulnerabilities in individuals on the schizophrenia spectrum may allow for the kind of mental flexibility that allows innovative ideas to proliferate (Sass, 2001).

Reconciliation of associations between creativity and both affective and thought disorders is aided when one considers a “unitary” or continuum model of mental illness (Eysenck, 1995; Claridge, 2009). This kind of model suggests that common underlying processes may characterize disorders ranging in degree of psychosis (e.g., depression, bipolar disorder, schizoaffective disorder, schizophrenia) and that these processes may manifest in the general population as tendencies toward certain personality styles (e.g., mildly depressive, schizotypal). This theoretical orientation is particularly relevant to a study investigating mental illness in adolescents, who are characterized by a more diffuse symptomology that seems to have an affective core of depressive symptoms.

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AQ: 4

Indeed, depressive symptoms in adolescence have been linked to later development of bipolar disorder, major depression, and schizophrenia (Correll et al., 2007; Cornblatt et al., 2003; Häfner et al., 1999; Pine et al., 1999).

Thus far the claim of a higher than average incidence of mental illness in artists has been primarily based on findings with established adult artists—those who have committed their lives to the arts. We know nothing about whether a similar relationship is also seen at a younger age in individuals just beginning to become involved in artistic activities. The goal of the present study was to determine whether there is also a heightened incidence of symptoms of mental illness in adolescents who choose to become involved in the arts as afterschool activities. Of course, only a small percentage of adolescents who involve themselves in the arts are likely to go on to become major artists.

To explore this association, we used a U.S. sample of 2,482 youth surveyed at age 15–16 from the National Longitudinal Survey of Youth, 1979-Child. We predicted that depressive symptomatology as measured by Center for Epidemiological Studies Depression Scale (CES-D) scores would be positively associated with involvement in afterschool arts. Our use of the CES-D was motivated by the previously mentioned findings showing that full development of mental illnesses such as bipolar disorder, major depression, and schizophrenia (while not present until adulthood) is likely to be preceded by a prodromal period that features depressive symptoms (e.g., Correll et al., 2007; Cornblatt et al., 2003). To ensure that any relationship uncovered was specific to arts involvement, we compared rates of depressive symptomatology in those involved in the arts versus those involved in sports as well.

It has been postulated that the link between artistry and mental illness is attributable to shared vulnerabilities predisposing individuals both to the arts and toward mental illness, but that a sufficiently high IQ and strong working memory may serve as protective factors, allowing individuals who may be predisposed toward mental illness to adapt their vulnerability into artistic creation (Carson, 2011). Consistent with this view is the finding that intelligence correlates with creativity (up to the IQ cutoff of 120 points; Baer & Kaufman, 2005), and the hypothesis that working memory skills are key in enabling people to sort through sensory input and turn it into creative output (e.g., Antonietti & Cornoldi, 2006). In contrast to this view, working memory deficits (reported in schizotypy and the schizophrenia prodrome; Park & McTigue, 1997; Smith, Park & Cornblatt, 2006) have been postulated to be advantageous for creativity (e.g., Sass, 2001). We therefore also examined the potential meditational roles of verbal IQ and working memory. We predicted that depression level would be associated with arts-involvement only in those adolescents with at least an average level of these cognitive resources available.

Method

Participants

A cross-sectional sample of 2,482 adolescents (1,244 males, 1,238 females) from the U.S. National Longitudinal Survey of Youth, 1979-Child (NLSY79-C) born between 1986 and 1995 and assessed in 2002, 2004, 2006, 2008, and 2010 at age 15 or 16 was

used. The NLSY79-C surveyed the children born to the female participants of the National Longitudinal Survey of Youth, 1979 (NLSY79), a study that began in 1979 with more than 12,000 participants ages 14–21 from across the United States. In our sample, 19.4% of the adolescents were Hispanic, 27.2% were Black, and 53.5% were non-Black, non-Hispanic. The NLSY79-C consisted of a battery of social, emotional, health, and cognitive assessments collected primarily through in-home assessments by trained interviewers (Center for Human Resource Research, 2009).

Measures

Arts and sports involvement. Amount of involvement in arts (“lessons in music, art or drama, or practice of music, singing, drama, drawing/painting”) and sports (“going to sports lessons or playing sports, or practicing any physical activity”) in the time period after school since the last survey round (a period of two years) was assessed using survey items asked of all 2,482 youth. Relative frequencies of involvement in arts were: *Often*: $n = 386$, 15.6%, *Sometimes*: $n = 409$, 16.5%, *Almost Never*: $n = 1,687$, 68%; and in sports were: *Often*: $n = 546$, 22%, *Sometimes*: $n = 1,181$, 47.6%, *Almost Never*: $n = 755$, 30.4%.

Depressive symptomatology. Depressive symptoms were measured with a seven-item version of the Center for Epidemiological Studies Depression Scale (CES-D). The items in this scale assessed frequency of various moods or problems associated with depression: (1) poor appetite, (2) difficulty concentrating, (3) depressed mood, (4) lack of energy/motivation: “everything took extra effort,” (5) restless sleep, (6) sad mood, and (7) lack of energy/motivation: “could not get going.” A four-level response scale was available for each symptom, from *none of the time* to *all of the time*. A total depression scale score ranging from 0–21 was available for all participants ($M = 4.14$, $SD = 3.44$). We performed a logarithmic transformation of the variable to correct for a positive skew in the distribution of scores (see Figure 1). Logistic regression analyses involving the depression scale score were

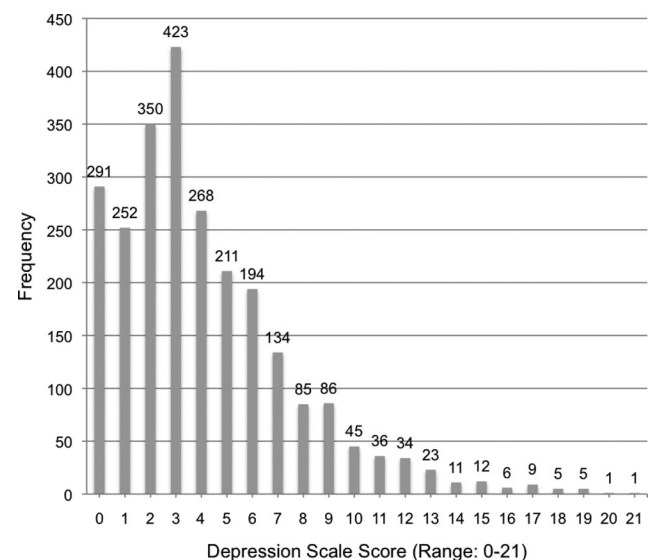


Figure 1. Distribution of CES-D Depression Scale scores in the whole sample. AQ: 5

conducted on the log-transformed variable; all means reported were based on the raw variable.

Verbal IQ. Verbal IQ was measured by use of the most recently available Peabody Picture Vocabulary Test–Revised (PPVT-R), Form L, percentile score for each participant (available for 2,451 participants: $M = 44.91$, $SD = 31.84$). The PPVT-R “measures an individual’s receptive (hearing) vocabulary for Standard American English and provides, at the same time, a quick estimate of verbal ability or scholastic aptitude” (Dunn & Dunn, 1981, cited in [Center for Human Resource Research, 2009](#)). The instrument has been found to have good validity as a test of verbal IQ with minimal cultural bias (Groth-Marnat, 2003; Simeonsson, Cook, & Hill, 2001).

Working memory. Working memory was measured by use of Wechsler Intelligence Scales for Children–Revised (WISC–R) Digit Span scores from when the participants were approximately 10 years old. Standard Digit Span scores (ranging from 1–19) were available for 2,217 (78%) participants ($M = 9.93$, $SD = 3.1$). The Digit Span assessment requires listening to, remembering, and reciting sequences of numbers both forward and backward, and taps short-term auditory memory as well as the ability to form a mental image of the sequence, hold it in memory, and flexibly manipulate it (Groth-Marnat, 2003).

Data Analyses

Descriptive analyses were conducted using chi-square tests and t tests. Because no differences emerged between the *Often* and *Sometimes* levels of arts-involvement, we merged these groups to create an “Arts” group and compared this group with the “No Arts” group (the *Almost Never* level). We did the same for sports-involvement: those with involvement at the *Often* and *Sometimes* level constituted the “Sports” group, and those involved *Almost Never* constituted the “No Sports” group. Logistic regression analyses were conducted to estimate odds ratios of arts involvement based on depression scale score. These were repeated with the data split at the median of verbal IQ scores and at the median of working memory scores.

Results

Descriptives

Chi-square tests revealed that females were more likely to be involved in the arts than males, $\chi^2(1, n = 2482) = 21.96$, $p < .001$, $\phi = .094$. The female adolescents also had higher mean depression scale scores ($M = 4.49$, $SD = 3.62$) than did male adolescents ($M = 3.79$, $SD = 3.22$), $t(2480) = 5.08$, $p < .001$, $d = .20$. Consistent with previous studies linking creativity with IQ (Baer & Kaufman, 2005), adolescents involved in the arts had higher mean PPVT scores ($M = 49.37$, $SD = 32.78$) than those who were not involved ($M = 42.80$, $SD = 31.17$), $t(2449) = 4.80$, $p < .001$, $d = .21$, and higher mean Digit Span scores ($M = 10.26$, $SD = 2.99$) than those who were not involved ($M = 9.78$, $SD = 3.12$), $t(2215) = 3.43$, $p < .001$, $d = .16$.

Arts and Depressive Symptoms

As predicted, adolescents involved in arts activities scored higher on the depressive symptomatology scale compared with

those not involved in the arts. As shown in [Figure 2](#), an $F2$ independent-samples t test revealed that mean depression scale scores were higher in the Arts group ($M = 4.57$, $SD = 3.68$) than in the No Arts group ($M = 3.93$, $SD = 3.31$), $t(2480) = 4.35$, $p < .001$, $d = .18$.

As shown in [Figure 3](#), logistic regression analyses revealed that $F3$ with each unit increase in depression scale scores, the odds that an adolescent would be involved in the arts increased (OR = 1.27, 95% CI 1.13–1.43, $p < .001$). This positive relationship between arts and depression scale score was significant only for those over the median in Digit Span scores, regardless of PPVT scores (PPVT over median and Digit Span over median: OR = 1.36, 95% CI 1.07–1.73, $p = .012$; PPVT under median and Digit Span over median: OR = 1.75, 95% CI 1.18–2.59, $p = .005$). There was no significant relationship between arts involvement and depression for those under the median in Digit Span scores (PPVT over median and Digit Span under median: OR = 1.18, 95% CI .934–1.50, $p = .163$; PPVT under median and Digit Span under median: OR = 1.10, 95% CI .886–1.38, $p = .378$). These results indicate that the association between involvement in the arts and depressive symptomatology is dependent upon working memory capacity, but not verbal IQ scores. In addition, depression scale scores significantly predicted arts involvement for both male (OR = 1.41, 95% CI 1.07–1.87, $p = .015$) and female adolescents (OR = 1.44, 95% CI 1.12–1.86, $p = .004$).

Sports and Depressive Symptoms

In direct contrast to the Arts group, the Sports group had lower mean depression scale scores ($M = 4.00$, $SD = 3.26$) than the No Sports group ($M = 4.46$, $SD = 3.82$), $t(2480) = 3.07$, $p = .002$, $d = .13$ (see [Figure 2](#)). Because some students might be involved in both arts and sports, we also examined mean depression scale

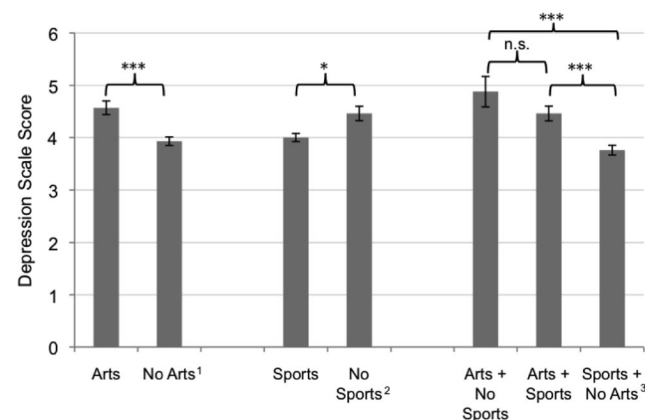


Figure 2. CES-D Depression Scale Scores in adolescents involved in the arts and sports. * $p < .01$; *** $p < .001$. Error bars indicate standard error of the mean (SEM). ¹ Entire sample included: Arts ($n = 795$), No Arts ($n = 1687$). ² Entire sample included: Sports ($n = 1727$), No Sports ($n = 755$). ³ Arts + No Sports group is just participants who answered “often” or “sometimes” for arts and “almost never” for sports ($n = 210$). Arts + Sports group is just participants who answered “often” or “sometimes” for both arts and sports ($n = 585$). Sports + No Arts group is just participants who answered “often” or “sometimes” for sports and “almost never” for arts ($n = 1142$).

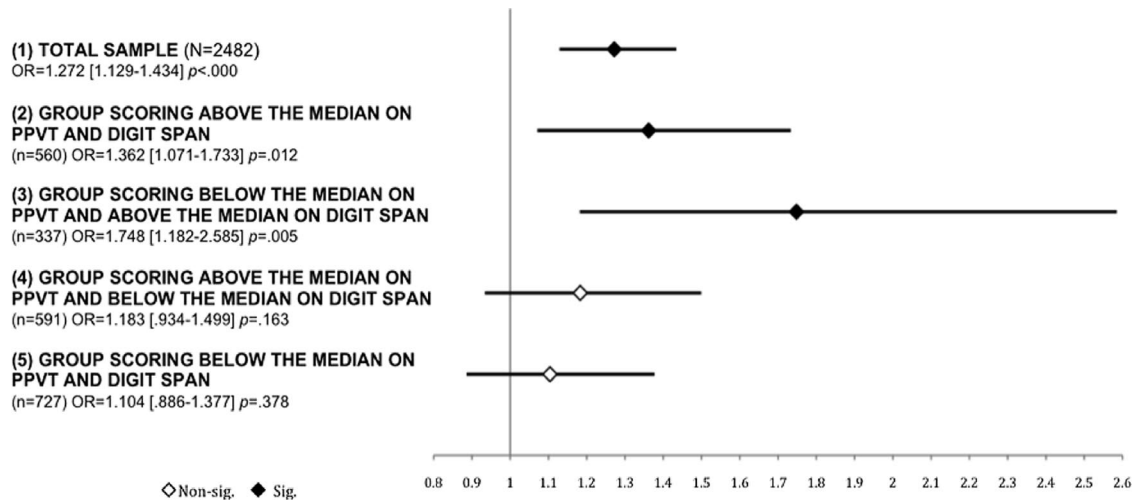


Figure 3. Increase in the odds of adolescent arts-involvement for each one-unit increase in Depression Scale Score. Figure indicates (1) that a one percent increase in depression scale score increased the log-odds of arts involvement by .0127 for the whole sample. For those above the median in PPVT scores and Digit Span scores, (2) a one percent increase in depression scale score increased the log-odds of arts involvement by .0136. For those under the median in PPVT scores and above the median in Digit Span scores, (3) a one percent increase in depression scale score increased the log-odds of arts involvement by .0175. There was no significant relationship between arts involvement and depression for those below the median (4 and 5) in Digit Span scores.

scores in the following independent groups: those only involved in the arts (210 youth responded “often” or “sometimes” to arts and “almost never” to sports), those involved in both arts and sports (585 youth responded “often” or “sometimes” to both arts and sports), and those only involved in sports (1,142 youth responded “often” or “sometimes” to sports and “almost never” to arts). As shown in Figure 2, the “Arts + No Sports” ($M = 4.88$, $SD = 4.22$) and “Arts + Sports” ($M = 4.46$, $SD = 3.47$) groups both had significantly higher mean depression scale scores than did the “Sports + No Arts” group ($M = 3.76$, $SD = 3.12$), $t(1350) = 4.51$, $p < .001$, $d = .30$; $t(1725) = 4.27$, $p < .001$, $d = .21$. There was no statistical difference in the depression scale scores of arts-involved youth who were or were not also involved in sports ($p > .05$). Importantly, youth involved in sports (“Arts + Sports” group and “Sports + No Arts”) had significantly higher depression scale scores if they were also involved in the arts, indicating that arts and not a lack of sports participation is associated with depression.

Discussion

Our analyses demonstrate that adolescents experiencing depressive symptoms are more likely to be involved in afterschool arts than are their less-dysphoric counterparts. Although previous studies have provided evidence of a higher than expected incidence of affective and thought disorders in eminent artists and creative adults, the study reported here demonstrates, for the first time, higher than expected depressive symptoms in adolescents with only casual arts involvement, most of whom are certainly unlikely to go on to become eminent artists. This finding suggests that the link between artistry and a tendency toward psychological disorder is broader than previous research has suggested, extending down in age and reaching out to those with interests and abilities in the arts not sufficiently powerful to propel them to become artists.

The relationship between early symptoms and adult disorders is not fully understood; however, some research has shown that the prodromal periods of bipolar disorder and schizophrenia show substantial overlap in youth and include a mixture of subthreshold depressive symptoms (Correll et al., 2007). Although it is certainly possible that depressive symptoms in adolescence will not lead to psychopathology in adulthood in many of these teens, it is also possible that depressive symptoms in adolescence could be precursors to later thought or affective disorder symptoms, both of which have been found to correlate with artistic creativity in adulthood.

Future research should examine whether the vulnerability to depression found here in some arts-involved youth is related to the quality of their artistic output, the likelihood of their continued involvement in the arts into adulthood, and the relationship between continued arts-involvement and adult CES-D scores. The continuation of the NLSY79-C into the adult years of our participants will allow us to explore some of these possibilities at a coarse level by examining occupational choices and other lifestyle and health variables. More detailed longitudinal examinations involving other samples that take into account specific creative achievements and associated psychological factors across development will also be useful.

How can the relationship between artistry and psychopathology be explained? One possibility is that individuals drawn to the arts have certain underlying cognitive vulnerabilities that can lead to both positive and negative psychological and behavioral outcomes. Investigators (Carson, 2011; Eysenck, 1995) have proposed that one of these vulnerabilities is an attentional style that allows a higher than average amount of information to enter awareness (i.e., reduced latent inhibition [LI])—a failure to habituate to meaningless stimuli; e.g., Lubow & Gewirtz,

1995). Reduced LI has been associated with schizophrenia, schizotypy, and anxiety (Braunstein-Bercovitz, Rammsayer, Gibbons, & Lubow, 2002; Lubow & Gewirtz, 1995; Lubow, 2005); and also with creative achievement (e.g., Carson, Higgins & Peterson, 2003; Kéri, 2011) and the personality trait of Openness—which itself is associated with creativity (Peterson & Carson, 2000; Peterson, Smith & Carson, 2003).

Reduced LI could contribute to both depressive symptoms and artistic creativity in the following ways. First, an increase in the amount and intensity of aberrations perceived in the environment may lead to unusual thinking and behavior, and, as a result, to social difficulties (which may appear as schizotypal tendencies). Depressive symptoms and increased general distress as a result of this excess stimuli and an outsider status would not be surprising and would echo theories that stressful life events can exacerbate psychological vulnerabilities and lead to a mix of affective and thought disturbances (e.g., Ventura et al., 2000). On the other hand, heightened awareness of external stimuli could lead to a desire to experience the world artistically and therefore to attend to color, form, sound, words, movement, and other elements that constitute the material of artistic expression. These two links could explain our finding of greater arts involvement in those with depressive symptoms, and might also explain why youth with more depressive symptoms are less involved in sports, which generally require ease in a group, an outward rather than an inward focus, and minimal preoccupation with extraneous stimuli.

Carson (2011) has also suggested that the association between arts involvement and psychopathology is mediated by IQ and working memory: individuals with higher IQs and enhanced working memory may have the cognitive resources to manage the input resulting from their heightened awareness and to turn it into productive creative output through arts involvement. Our analyses partially support this hypothesis. Working memory, but not verbal IQ, mediated the relationship between arts involvement and depressive symptoms: only those with working memory scores above the median showed a relationship between arts involvement and depression scores. As we have suggested above, it is possible that a cognitive style low on inhibition that reflects schizotypal tendencies may underlie the link between depressive symptoms and the arts in these adolescents. However, the finding that the association is dependent on above-median working memory performance presents a complication to this possibility because the schizophrenia spectrum has been linked to deficient working memory in many studies (e.g., Park & McTigue, 1997; Smith, Park & Cornblatt, 2006).

The possibility that some cognitive traits may underlie both artistry and mental illness calls for further research, and the role of mental imagery in both arts involvement and psychopathology is also a good candidate for investigation. It has been shown that strong mental imagery skills are associated with arts involvement (Blazhenkova & Kozhevnikov, 2010) as well as with a range of psychological disorders including depression, PTSD, psychosis (Holmes & Mathews, 2010), and mental imagery skills have also been theorized to be associated with strong performance on the Digit Span test of working memory (Groth-Marnat, 2003). Vivid mental imagery abilities would therefore constitute another potential vulnerability that could be transformed into a strength in the practice of arts.

It is also possible that personality tendencies underlie the link between arts and depressive symptoms in these adolescents. Introversion has been linked to depression (Barnett & Gotlib, 1988), and arts activities may provide a solitary activity that is preferable to team sports, for example. The link between arts and depressive symptoms could also be an artifact of female adolescents being more likely than males to participate in the arts and to be depressed. This possibility was not borne out, however, because the association between arts and depression scale score was significant in both female and male adolescents in our sample (see Results). The link between arts and depression could also be a result of arts activities being therapeutic for dysphoric youth. Finally, it is important to acknowledge that the arts involvement variable is at most an indirect proxy for creativity and/or artistic skill. Parents likely influence adolescents' activity choices, making their true devotion to these activities unclear, and certainly, still in formation.

When universal, positive behaviors such as involvement in the arts are associated with symptoms of mental illness, it is imperative for psychologists to uncover the mechanisms behind such an association. Clearly depressive symptoms are not a necessary condition for involvement in the arts in adolescence or for becoming an eminent artist. But understanding why a higher than average proportion of people drawn to the arts also show signs of affective or thought disorders throughout development should help us better understand both artistic behavior and psychopathology.

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