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A Test of Problem Behavior and Self-Medication Theories in Incarcerated Adolescent Males

Christianne Esposito-Smythers, PhD,

Brown Medical School, Department of Psychiatry & Human Behavior, Providence, RI; Brown University Center for Alcohol & Addiction Studies, Providence, RI; and Bradley Hasbro Children's Research Center, Providence, RI.

Joseph V. Penn, MD,

Brown Medical School, Department of Psychiatry & Human Behavior, Providence, RI; Bradley Hasbro Children's Research Center, Providence, RI; and Rhode Island Hospital, Providence, RI.

L. A. R. Stein, PhD,

Brown Medical School, Department of Psychiatry & Human Behavior, Providence, RI; and Brown University Center for Alcohol & Addiction Studies, Providence, RI.

Molly Lacher-Katz, BA, and

Rhode Island Hospital, Providence, RI.

Anthony Spirito, PhD

Brown Medical School, Department of Psychiatry & Human Behavior, Providence, RI; Brown University Center for Alcohol & Addiction Studies, Providence, RI; and Bradley Hasbro Children's Research Center, Providence, RI.

Abstract

The purpose of this study is to examine the problem behavior and self-medication models of alcohol abuse in incarcerated male adolescents. Male adolescents ($N = 56$) incarcerated in a juvenile correction facility were administered a battery of psychological measures. Approximately 84% of adolescents with clinically significant alcohol-related problems prior to incarceration indicated use of alcohol for purposes of self-medication and 73% indicated that their alcohol use was associated with aggressive and rebellious behavior. Further, adolescents with clinically significant alcohol-related problems prior to incarceration reported higher levels of affective symptoms, mood-related cognitive distortion, and less use of social support during incarceration than adolescents without clinically significant alcohol-related problems. They also reported more symptoms associated with oppositional defiant but not conduct disorder. For the majority of incarcerated male adolescents in this sample, alcohol-related problems appeared to be associated with both self-medication and problem behavior. Incarcerated adolescents with a history of alcohol-related problems may require skills training in addition to substance abuse services to address affective symptoms and coping skill deficits.

Keywords

Alcohol; incarcerated juveniles; mental health; problem behavior model; self-medication model; substance use

Numerous studies have documented the higher prevalence of emotional, behavioral, and substance abuse problems among youth in the juvenile justice system when compared to the general population (Domalanta, Risser, Roberts, & Risser, 2003; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002). It is estimated that 50–70% of incarcerated adolescents have psychiatric and/or substance use disorders (Teplin et al., 2002). These findings are not entirely surprising, given that youth charged with offenses often display symptoms of conduct disorder (CD). Indeed, the prevalence of CD among juvenile justice populations ranges from 30% to as high as 90% (Davis, Bean, Schumacher, & Stringer, 1991; Garland et al., 2001).

Both longitudinal and cross-sectional studies have documented that preexisting conduct problems constitute a significant risk factor for substance abuse (Hawkins, Catalano, & Miller, 1992; Kuperman et al., 2001). In a sample of 166 adolescents presenting for treatment of substance use problems, researchers found that nearly every youth (95%) met criteria for a CD diagnosis (Brown, Gleghorn, Schuckit, Myers, & Mott, 1996). Additionally, when researchers only considered behaviors that occurred in the absence of substance use, half (47%) continued to meet diagnostic criteria for CD. Concurrent substance use may also increase the risk of more serious delinquent behavior (Loeber & Keenan, 1994), suggesting a reciprocal relation between severity of conduct problems and substance abuse among adolescents.

Research conducted to examine the relation between conduct and substance abuse problems suggests that these behaviors may stem from an underlying construct of antisociality. Specifically, in accordance with problem behavior theory, substance abuse may represent one additional behavior composing a “syndrome” of problem behavior (Donovan & Jessor, 1985). A fair amount of research has provided support for problem behavior theory in adolescent populations (e.g., Duncan, Duncan, & Strycker, 2000; Farrell, Danish, & Howard, 1992). Adolescents who engage in delinquent behaviors are more prone to engage in illicit activities, associate with delinquent peers who have similarly poor social and problem-solving skills, victimize other delinquent youth, and both use and distribute illicit drugs (Loeber et al., 2001).

While the problem-behavior theory model has been relatively well tested, less research has been conducted to examine the relation between internalizing symptoms and substance abuse. In accordance with a self-medication model (Khantzian, 1997), it is plausible that substances are used by some youth to self-medicate depressive symptoms, hopelessness, and internalized anger. Research suggests that internalizing disorders tend to precede the onset of alcohol use and other substance use disorders (Kessler et al., 1997). Further, early mood and anxiety disorders have been shown to double the risk of initiating alcohol use in adolescence (Kaplow, Curran, Angold, & Costello, 2001). In a study by Newcomb, Bentler, and Huba (1988), including 1,068 high school students, over half reported use of alcohol to reduce negative affect (i.e., stop boredom, get rid of anxiety or tension, and/or feeling sad, blue, or depressed).

Although support exists for the self-medication hypothesis in adolescence, results across the literature have generally been inconsistent. Differences in samples (normative versus clinical), types of negative affect assessed (e.g., depression, anxiety, anger), and study designs (cross-sectional versus longitudinal) may contribute to discrepant results (Esposito-Smythers & Spirito, 2004). Also of importance in prior examinations of the self-medication model is that substance use and negative affect have been measured concurrently. Among regular users, the possibility of a substance induced mood disorder cannot be ruled out. Further, active regular use of substances may mask symptoms of depression and anxiety; thus, a relation between these factors is less likely to be found. A better test of the self-medication model may be to assess internalizing symptoms among regular users in situations where access to alcohol use

has been removed. If internalizing symptoms underlie alcohol use, then one might expect higher internalizing symptoms among regular users in the absence of the self-medicating agent.

As self-medication can be conceptualized as a maladaptive coping strategy used to manage negative affect, it is also likely that individuals who use alcohol to cope with symptoms of depression or anxiety rely more heavily on emotion-focused versus problem-focused coping. Problem-focused coping involves direct efforts to alter or remove a stressor (e.g., problem-solving, seeking support) and emotion-focused coping is directed at managing negative emotion related to the problem (wishful thinking, withdrawal; Wills & Hirky, 1996). Problem-focused coping has been linked to lower levels of substance use and related problems, whereas emotion-focused coping has been associated with higher levels of substance related problems (Wills, Sandy, Yaeger, Clearly, & Shinar, 2001). Thus, it is likely that individuals who engage in self-medication may more readily employ emotion versus problem-focused coping strategies in the face of life stressors.

In the present study, we examined the self-medication and problem behavior theory models in a sample of incarcerated youth who have been denied access to alcohol and other substances. Specifically, we compared youth with versus without alcohol-related problems prior to incarceration on indices of affective and cognitive symptoms as well as coping skills during incarceration. We examined two hypotheses. In accordance with a self-medication model, we hypothesized that, in the absence of alcohol, youth with significant alcohol-related problems prior to incarceration would report higher rates of (a) affective symptoms and cognitions related to negative affect, (b) less use of problem-focused coping, and (c) greater use of emotion-focused coping, compared to those without such a history. Secondly, as alcohol use and other problem behaviors are believed to stem from the same underlying construct of antisociality according to problem behavior theory, we hypothesized that adolescents with alcohol-related problems prior to incarceration would report significant behavioral problems while incarcerated even in the absence of alcohol.

METHOD

Participants

Fifty-six male adolescents who were admitted to a juvenile correctional facility in the Northeast comprised the study sample. Their mean age was 17.7 years (range = 15–20, SD = 1.2). One participant was in the eighth grade (1.8%), three in ninth grade (5.4%), five in tenth grade (8.9%), eight in eleventh grade (14.3%), nine in twelfth grade (16.1%), three graduated from high school (5.4%), nine were working toward their graduate equivalency diploma (GED; 16.1%), seven obtained their GED (12.5%), and seven were taking college courses (12.5%). Four participants did not indicate their educational status (7.1%). Prior to incarceration, 42 (75%) participants were living with one or both of their parents, seven with other relatives (12.5%), four were in care of the state (7.1%), and three were living independently (5.4%). There were 29 (51.8%) White, 8 (14.3%) Black, 14 (25%) Hispanic, and 5 (8.9%) youth of other race.

The medium security correctional facility from which the youth were recruited serves as the state's sole juvenile correctional facility. Approximately 1,100 youth are admitted per year (some recidivists). All youth are sent to the facility by the state family court. The average time served is approximately 6.1 months. Youth are incarcerated for a variety of violent and nonviolent offenses. On average, approximately 20% of youth housed at the facility are preadjudicated (pre-trial) and 80% are adjudicated (sentenced). Both preadjudicated and adjudicated youth were included in the present study.

Measures

Adolescent Drinking Index (ADI)—The ADI (Harrell & Wirtz, 1989) is a 24-item self-report questionnaire that provides an index of severity of problem drinking among adolescents referred for emotional or behavioral disorders. Adolescents are asked to indicate the degree to which statements related to drinking apply to them using a 3-point Likert scale. The latter 14 questions ask the adolescent to indicate the frequency with which they have experienced various problem drinking behaviors using a 4-point Likert scale. Higher scores reflect increasing levels of alcohol-related problem behaviors. The ADI contains a total severity index, as well as two subscales based on patterns associated with problem drinking. A self-medication drinking subscale assesses the degree to which drinking is used to alter mood. A rebelliousness subscale is an indicator of the degree to which aggressive, rebellious behavior is related to drinking. Adequate internal consistency and validity have been demonstrated by the authors. A cutoff score of 16 or greater suggests a clinical need for alcohol treatment services (Harrell & Wirtz, 1986). In the present study, the alpha coefficient for the ADI was 0.86.

Youth Self-Report Form (YSR)—The YSR (Achenbach & Rescorla, 2001) symptom inventory includes 113 items tapping emotional and problem behaviors in children and adolescents. In the present study, participants were asked to indicate how true each item is presently using a 3 point Likert scale, with higher scores reflecting greater dysfunction. Composite scores are obtained for internalizing, externalizing, and total problems, as well as eight behavioral syndromes and six DSM-oriented scales. Adequate reliability, validity, and normative data have been reported for this measure (Achenbach & Rescorla, 2001).

Cognitive Triad Inventory for Children (CTI-C)—The CTI-C (Kaslow & Stark, 1986) is a 36-item self-report questionnaire designed to assess self-perceived competencies and global self-worth in children and adolescents; cognitive factors that underlie depression. Adolescents indicate how similar the stated thoughts or opinions are to those of their own by circling yes, no, or maybe. Higher scores reflect less depressive cognition. Adequate internal consistency and validity have been demonstrated with adolescents (Kaslow & Stark, 1986). In the present study, the alpha coefficient for the CTI-C was 0.93.

Negative Affect Self-Statement Questionnaire (NASSQ)—The NASSQ (Ronan, Kendall, & Rowe, 1994) is a 39-item self-report instrument that assesses frequency of anxious and depressive self-talk experienced by children and adolescents within the past week. Each item is rated on a 5-point Likert scale. Higher scores reflect more frequent negative self-talk. Adequate internal consistency and validity have been demonstrated with adolescents (Ronan et al., 1994). In the present study, the alpha coefficient for the NASSQ was 0.94.

Kidcope—The Kidcope (Spirito, Stark, & Williams, 1988) is a checklist designed to assess the use of 10 cognitive and behavioral coping strategies (cognitive restructuring, self-criticism, blaming others, emotion regulation, wishful thinking, problem-solving, social withdrawal, social support, distraction, resignation) in response to a stressor. Participants were asked to indicate how often they used each coping strategy, on a 5-point Likert scale, to cope with their incarceration. Higher scores reflect greater use of coping strategies. Moderate test–retest reliability and concurrent validity have been reported for the Kidcope (Spirito et al., 1988).

Adolescent Drinking Questionnaire (ADQ)—The ADQ (Donovan, Jessor, & Costa, 1999) was used to assess alcohol use. It contains four items that measure average drinking quantity, frequency of drinking, high volume drinking, and drunkenness, using 8-point Likert scales. Construct validity has been well established for this measure (Donovan et al., 1999). In this study, drinking frequency and high-volume drinking items were used to classify participants into two drinking groups. Participants were classified as “regular users” if they

reported drinking at least once a month prior to incarceration. They were classified as “heavy drinkers” if they reported drinking 5 or more drinks (Department of Health and Human Services [DHHS], 2004) each time they drank.

Procedure

Approval to conduct the study in the juvenile detention facility was obtained from the authors’ hospital institutional review board and the juvenile correctional facility. A bachelor’s-level research assistant working in the juvenile detention facility obtained a list of newly detained adolescents on a daily basis. A letter describing the study and a parental consent form were sent via mail to the legal guardians of 100 consecutive new detainees. In consent and assent forms, adolescents and their parents were made aware that a research assistant working within the juvenile detention facility would conduct the assessments, participation was entirely voluntary, information from assessments would be shared with the facility psychiatrist if the adolescent indicated clinically significant suicidal thoughts during the assessment, and that the data collected would be included in a research study. Parents were asked to return the signed parental consent form to the research assistant if they agreed to allow their child to participate. After a week had lapsed, the research assistant contacted guardians by phone to follow-up on the letter and determine whether they were interested in allowing their child to participate in the study and, if so, to return the consent form. Fifty-seven parents/guardians, of 100 letters sent, returned the consent forms with their approval. Those adolescents who received parental consent (56 males and one female) were read a description of the study contained on the assent form and then signed the assent form if they agreed to participate. All adolescents agreed to participate. The research battery was administered to the adolescents in a private room at the facility. Upon completion of the assessment, adolescents were provided with a \$20 gift certificate for their participation that could be used upon discharge from the detention facility. Data from the 56 male participants are presented below.

RESULTS

Approximately 66% ($n = 37$) of participants scored above the clinical cutoff (≥ 16) on the ADI, thus indicating clinically significant alcohol-related problems. Of these participants scoring above the clinical cutoff, 84% ($n = 31$) indicated use of alcohol for purposes of self-medication and 73% indicated that their alcohol use was associated with aggressive and rebellious behavior. Preliminary analyses examined whether there were any demographic differences between the ADI+ (scored above the clinical cutoff) and ADI- (scored below the clinical cutoff) groups. The ADI groups were found to be statistically equivalent in terms of age and race.

According to the frequency and heavy drinking items from the ADQ, approximately 70% ($n = 39$) of participants reported drinking at least monthly prior to incarceration and thus were categorized as “regular drinkers.” Furthermore, 54% ($n = 30$) reported drinking 5 or more drinks each time they drank and were categorized as “heavy drinkers.” The regular vs. non-regular drinkers, and heavy vs. non-heavy drinkers, were statistically equivalent in terms of age and race.

ADI Groups

A series of *t*-tests were used to examine differences in psychiatric symptoms and use of coping strategies between ADI+ and ADI- groups. Alpha corrections were not made due to the small sample size but effect sizes were calculated for each comparison. A $d = 0.2$ is small, $d = 0.5$ is medium, and $d = 0.8$ is considered a large effect size (Cohen, 1977).

The YSR was used to assess psychiatric symptoms associated with DSM-IV diagnoses (see Table 1). Those in the ADI+ group reported greater symptoms associated with affective disorder and oppositional defiant disorder than those in the ADI- group. Further, the effect size for each of these variables was in the large range. Although no statistically significant differences were found between groups in symptoms associated with somatization or conduct disorder, the effect size for each of these variables was in the medium to large range. No statistically significant differences or notable effect sizes were found between ADI groups for symptoms associated with anxiety or attention/hyperactivity disorders. Participants also completed two measures which tap cognitive symptoms associated with depression and/or anxiety (see Table 1). Scores from the CTI-C and NASSQ indicated that those in the ADI+ versus ADI- group reported greater cognitive distortion, with effect sizes in the large range.

The Kidcope was used to assess frequency of coping strategies employed by participants to deal with their incarceration. The ADI+ versus ADI- group reported less use of social support, $M = 1.2$, $SD = 0.9$, vs. $M = 1.8$, $SD = 1.2$, $t(53) = 2.33$, $p \leq .05$, $d = 0.57$, and a trend toward more social withdrawal, $M = 1.8$, $SD = 1.0$, vs. $M = 1.3$, $SD = 1.1$, $t(53) = 1.98$, $p < .06$, $d = 0.48$, with effect sizes approximating or within the medium range. No statistically significant differences or notable effect sizes were found between ADI groups in use of other types of coping strategies.

Frequency and Quantity of Drinking

A series of *t*-tests were used to examine differences in psychiatric symptoms and coping skills between regular drinkers vs. non-regular drinkers and heavy drinkers vs. non-heavy drinkers. When comparing regular vs. non-regular drinkers, no statistically significant differences in psychiatric symptoms or cognitive symptoms of depression/anxiety were found. However, although not statistically significant, a medium effect size was found for conduct disorder, $d = 0.57$, with regular drinkers reporting more conduct problems than non-regular drinkers. A trend for regular drinkers, $M = 52.9$, $SD = 13.2$, to report more cognitive symptoms of depression than non-regular drinkers, $M = 59.5$, $SD = 7.5$, on the CTI-C, $t(54) = 1.92$, $p \leq .06$, $d = 0.61$, was also found. When comparing regular vs. non-regular drinkers on methods employed to cope with incarceration, only seeking support was significant, with regular drinkers, $M = 1.21$, $SD = .99$, vs. non-regular drinkers, $M = 1.82$, $SD = 1.13$, reporting less use of social support, $t(53) = 2.03$, $p < .05$, $d = 0.58$. However, although not statistically significant, a medium effect size was found for social withdrawal, $d = 0.49$, and wishful thinking, $d = 0.58$, with regular vs. non-regular drinkers reporting more use of social withdrawal and less use of wishful thinking to cope with their incarceration.

When comparing heavy vs. non-heavy drinkers, no statistically significant differences in psychiatric symptoms or cognitive symptoms of depression and anxiety were found. However, a medium effect size was found for oppositional defiant disorder, $d = 0.52$, with heavy drinkers reporting more disruptive behavior symptoms than non-heavy drinkers. When comparing heavy vs. non-heavy drinkers on methods employed to cope with incarceration only social withdrawal was significant, with heavy drinkers, $M = 1.97$, $SD = 1.05$, vs. non-heavy drinkers, $M = 1.28$, $SD = 0.94$, reporting greater use of social withdrawal, $t(52) = 2.51$, $p < .05$, $d = 0.69$.

DISCUSSION

Most prior research conducted to examine self-medication theory in adolescents has assessed youth while they still had access to alcohol. This design is potentially problematic because regular alcohol use may, in part, mask internalizing symptoms. The present sample is unique in that we assessed adolescent internalizing symptoms after access to alcohol was restricted due to incarceration. Our results were consistent with that predicted by self-medication theory. Specifically, in the absence of access to alcohol, incarcerated adolescent males who exhibited

clinically significant alcohol-related problems prior to incarceration experienced more affective symptoms and greater affect-related cognitive distortion while incarcerated than adolescents without this history.

It was also hypothesized that incarcerated adolescent males with versus without a history of alcohol-related problems would report less use of problem-focused coping and greater use of emotion-focused coping strategies. Results suggested that youth with versus without significant alcohol histories were less likely to utilize the problem-focused coping strategy of seeking social support and a trend toward greater use of the emotion-focused coping strategy of withdrawal as a means to cope with current incarceration. Not surprisingly, a lack of initiative to seek social support and social withdrawal are two coping strategies shown to be associated with more severe internalizing psychopathology among adolescents. For example, Spirito, Francis, Overholser, and Frank (1996) found that psychiatrically hospitalized adolescents scored significantly higher on social withdrawal than controls. Similar findings were reported by Groholt, Ekeberg, Wichstrom, and Haldorsen (2000), who found that psychiatrically impaired adolescents with histories of suicide attempts were not likely to seek support from others when presented with both neutral and stressful situations.

We also examined whether incarcerated youth with alcohol-related problems prior to incarceration would demonstrate significant problem behaviors during incarceration, even in the absence of alcohol, as would be consistent with problem behavior theory. Results suggested that symptoms associated with oppositional defiant disorder but not conduct disorder were higher for those with versus without histories of alcohol-related problems, which provides partial support for the problem behavior model. The fact that oppositional defiant but not conduct symptoms differentiated these two groups may reflect the more limited ability of youth to engage in more extreme deviant behaviors while incarcerated. For example, while it may still be possible to express verbal oppositional behaviors (e.g., argue, disobey) while incarcerated, youth are less likely to be able to engage in some of the more extreme conduct disordered behaviors (e.g., run away, cruelty to animals). It is also possible that some of the oppositional defiant symptoms (e.g., irritability/anger) overlap with depressive symptoms, which may in part account for the relatively stronger relation with alcohol-related problems in comparison to conduct disorder. Alternatively, the small sample size may account for the lack of statistical significance as the effect size for conduct disorder was in the medium range.

Also of interest is that 84% of the adolescents who indicated clinically significant alcohol-related problems prior to incarceration endorsed items indicative of use of alcohol for purposes of self-medication, while 73% indicated that their alcohol use was associated with aggressive and rebellious behavior on the Adolescent Drinking Index subscales. Thus, the majority of adolescents with a history positive for alcohol-related problems reported their use to be associated with both self-medication and problem behavior. This finding is consistent with the typology described by Randall, Henggeler, Pickrel, and Bronding (1999), who found evidence for three distinct comorbid clinical profiles among adolescents with substance use disorders, including “externalizers” (i.e., comorbid conduct disorder), “internalizers” (i.e., comorbid mood/anxiety disorders), and “internalizers/externalizers” (i.e., comorbid conduct, mood, and anxiety disorders). Our findings suggest that most of the incarcerated adolescents in this sample could be characterized as “internalizers/externalizers.” Problem behavior is multiply determined, and coping with negative affect via alcohol and other substances may be one more avenue by which problem behavior develops. Negative affect may also result from problem behaviors as well.

The present study has several limitations. First, the small sample size in this study reduced power to find statistically significant differences. Therefore, we included effect size estimates in the results. Second, while the sample was racially diverse, it was limited to incarcerated

male adolescents. It is possible that results may not generalize to incarcerated females. Third, the study design was cross-sectional. Thus, it is not possible to determine whether the removal of access to alcohol was directly associated with affective, cognitive, and behavioral disturbances. Fourth, the Youth Self-Report Form, the primary measure used to assess psychiatric symptoms in the present sample, does not contain validity scales to detect over- or underreporting of symptoms. Therefore, it is possible that study findings could be attributed to general overreporting of symptoms among youth with significant alcohol histories. However, this explanation is unlikely as youth with a history of alcohol-related problems compared to those without such a history did not endorse greater anxiety, somatic, or inattentive symptoms. Last, the potential for sample bias exists as only 57% of families contacted returned their consent forms. As we chose to obtain active parental consent, recruitment with this incarcerated adolescent population was inherently more difficult. However, given the dearth of research in this area, even preliminary research with incarcerated youth remains valuable and can be used to inform future studies. Future research would benefit from a longitudinal design that examines these models in large representative incarcerated male and female adolescent samples, both prior to and after access to alcohol has been restricted.

These findings have implications for screening, evaluating, and managing incarcerated youth. First, it is important to note that 66% of adolescent males reported clinically significant alcohol-related problems prior to incarceration. Further, 70% reported regular drinking and 54% heavy drinking. These rates are significantly higher than those reported in anonymous school-based surveys with high school seniors, in which 48% report any drinking in the prior month and only 29% report heavy drinking (Johnson, O'Malley, Backman, & Schulenberg, 2005). Further, our results suggest that adolescents with significant alcohol histories may demonstrate greater mood disturbance, oppositional behaviors, and less effective coping skills than those without such a history. Thus, youth who present with histories of significant alcohol-related problems should be identified as particularly in need of not only substance abuse services during incarceration but also skills-based treatments to address affective symptoms and coping skill deficits. Second, results suggest that typical quantity/frequency measures may not be as effective at identifying adolescents who will experience internalizing psychiatric and cognitive symptoms upon incarceration as severity measures of alcohol-related problems. Quantity/frequency and heavy drinking measures were not found to be associated with affective or cognitive symptoms of mood disturbance during incarceration. Related, as most research examining self-medication theory has used quantity/frequency measures of substance use, it is not surprising that cooccurring internalizing symptoms are not found in those studies. Future research might employ measures of alcohol-related problems in examinations of self-medication models.

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TABLE 1

Means, Standard Deviations (SD), *t* Values, and Effect Sizes for ADI Groups on the Subscales of the Youth Self-Report

Measure	ADI Negative <i>M (SD) n = 18</i>	ADI Positive <i>M (SD) n = 32</i>	T	<i>d</i>
YSR T-Affective	56.2 (6.3)	62.3 (8.5)	2.64*	0.82
YSR T-Anxiety	55.3 (6.5)	56.2 (7.2)	0.42	0.13
YSR T-Somatic	53.3 (5.2)	56.7 (7.3)	1.70	0.54
YSR T-Attn/Hyper.	54.6 (6.2)	57.9 (8.6)	1.41	0.44
YSR T-Oppositional	52.8 (2.2)	60.8 (9.6)	3.47**	1.15
YSR T-Conduct	61.5 (7.4)	66.5 (10.6)	1.76	0.55
CTI-C	60.9 (5.8)	51.9 (13.4)	2.80*	0.81
NASSQ	64.8 (15.8)	83.4 (28.6)	2.62*	0.87

Note. *d* = effect size; *d* = .2 is small, *d* = .5 is medium, *d* = .8 is large, *df* = 48. YSR T = Youth Self-Report T-Scores; CTI-C = Cognitive Triad Inventory for Children; NASSQ = Negative Affect Self-Statement Questionnaire.

* $p \leq .05$.

** $p \leq .001$.